Strathfield Municipal Council

AT-Strathfield

An Active Travel Plan for Strathfield

21 October 2016

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Executive Summary

What is AT-Strathfield

AT-Strathfield is designed to provide a basis for improving walking and bicycle riding, building on the previous *Cycleways Map.* It is a more comprehensive plan that addresses pedestrians and bicycle rider needs throughout the study area. A successful implementation of *AT-Strathfield* would include:

1. Increased use of walking and bicycle riding for transport as measured through the Household Travel Survey (HTS) and Census Journey to Work (JTW), regular bicycle counts and bicycle parking usage surveys;
2. An inclusive walking and bicycle riding network that caters to the entire community including people with disabilities, children, seniors, commuters and recreational bike riders as measured through usage surveys;
3. No missing links within the walking and bicycle riding network as measured against the existing situation;
4. Achieving a lower pedestrian and cycle related crash rate with more crossings;
5. Completed implementation of a prioritised, costed network that supports Sydney's Walking and Bicycle riding Futures; and
6. Complement the Strathfield's aspirations of urban renewal and revitalisation through investment in high quality public spaces and places.

Why Develop AT-Strathfield?

AT-Strathfield provides an important framework increasing walking and bicycle riding as part of everyday transport. *AT-Strathfield is* a strategic document designed to drive investment to nudge the community towards walking and bicycle riding through infrastructure and behavioural change programs.

The goals of *AT-Strathfield* include the following:

- Integrating walking and bicycle riding into the transport system as a legitimate form of transport to encourage more frequent use;
- Providing appropriate walking and bicycle riding facilities where required, enhancing accessibility and mobility;
- Improvements to address clusters and patterns of pedestrian and bicycle rider accidents, to address safety issues; and
- Active transport routes that complement 'Safer Routes to Schools' projects and Local Area Traffic Management schemes.

Key Outcomes

Proposed walking and bicycle riding networks have been developed as part of *AT-Strathfield* to address safety and connectivity concerns identified through a review of pedestrian and bicycle crash data, consultation with the community and key stakeholders and through undertaking site investigations.

The following key walking and bicycle riding improvements have been identified:

Key Recommendations for Pedestrians

A hierarchy of primary and secondary walking networks has been developed as part of *AT-Strathfield*. The hierarchy of the primary and secondary routes should be used for implementing future pedestrian facilities.

In addition, it is recommended that Pedestrian Access and Mobility Plans (PAMPs) are developed for the following locations in order of priority.

1. Strathfield Town Centre;
2. Flemington Station;
3. Homebush Station / Parramatta Road; and
4. South Strathfield.

The expected costs for developing each PAMP would be around $30,000 to $70,000, which would be funded by Council and state government.

Other key recommended improvements to walking network include:

- Improvements to the pedestrian network AT-Strathfield Square which should be considered as part of urban renewal for the town centre precinct; and
- Closure of the existing underpass at Memorial Drive / Centenary Drive to the west of Sydney Markets to prevent unsafe pedestrian crossing at Memorial Drive.

Key Recommendations for the Bicycle Riders

The NSW Government's *Sydney's Cycling Future* report states that investments for bicycle facilities will be prioritised within five kilometre catchments of major centres, including Burwood, Parramatta, Bankstown and Sydney Olympic Park. Consultation with Roads and Maritime and Transport for NSW (TfNSW) identified that there is an opportunity to provide strategic bicycle network connections between these major centres through the Strathfield LGA.

AT-Strathfield proposes two new strategic bicycle routes through the Strathfield LGA, supported a network of local bicycle routes providing access to residential, employment, education and recreational land uses.

TfNSW has identified that fully separated cycleways are preferred for the strategic bicycle routes. Implementing these new strategic routes would result in minor impacts to car parking, with these impacts expected to be manageable as most properties along the routes have off-street parking.

The following key recommendations for the proposed bicycle network have been identified:

- 11 km of proposed separated cycleway along two new strategic bicycle routes. The cost estimate for the strategic bicycle routes is in the order of $10.5 M to $24 M and would be funded by state government.
- 7 km of new or upgraded shared paths. The cost estimate for the shared paths is in the order $2.5 M, which would be funded by both Council and state government;

- 16 km of on-on road bicycle routes, including on-road bicycle lanes or on-road mixed with traffic bicycle routes. The cost estimate for the local bicycle routes is in the order $3.7 M, which would be generally funded by Council; and
- A Wayfinding Strategy has been developed as part of *AT-Strathfield* to support the proposed bicycle network.

Supporting a Culture of Active Transport

AT-Strathfield provides a strategy to support the development of a culture of walking and bicycle riding in Strathfield. This strategy adopts a behavioural model consisting of motivating factors and enabling factors. Motivations for walking and bicycle riding include being fit and looking good and the pleasure of walking and bicycle riding.

A number of key enabling factors or conditions that need to be in place to support the goal of enabling more people to walk and ride a bicycle more regularly for all purposes in Strathfield, including:

- Pre-trip / individual enablers - a combination of intrapersonal and social factors that influence one's self-efficacy to and acceptance of walking and bicycle riding;
- The trip / trip enablers - a combination of walking and bicycle riding infrastructure, wayfinding and relationships with other road users; and
- End of trip / destination enablers - primarily concerned with the provision of appropriate facilities at destinations.

A number of behaviour change programs to address the enabling factors, including:

- Capacity building classes for beginners;
- Shared path coexistence campaign for both pedestrians and bicycle riders;
- Bicycle riding legitimisation campaign; and
- Power-assisted bicycle trial scheme.

Recommendations for the promotion and marketing of walking and bicycle riding in Strathfield have been provided, including:

- Normalizing walking and bicycle riding among the community in all related marketing material, including images of normal people riding in normal clothes etc.;
- Create an easily accessible map of the walking and bicycle network;
- Promote bicycle riding for travel to all Council run and sponsored events;
- Develop programs with stakeholders to promote bicycle riding and walking in Strathfield;
- Explore running two residential street programs, closing off a section of the street to motorized traffic and providing a range of walking; and
- Participate in NSW Bike Week.

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1. Why develop AT-Strathfield

Strathfield is a growing, dynamic and multicultural area located within a short distance of both Sydney and Parramatta. To support growth and a healthy community, it is important to provide alternatives to car use by enabling walking and bicycle riding for shorter trips and to access public transport.

To support Strathfield Council, GHD has developed *AT-Strathfield*, an Active Transport Plan which provides an important framework increasing walking and bicycle riding as part of everyday transport.

AT-Strathfield is a strategic document designed to drive investment to nudge the community towards walking and bicycle riding through infrastructure and behavioural change programs.

The goals of *AT-Strathfield* include the following:

- Integrating walking and bicycle riding into the transport system as a legitimate form of transport to encourage more frequent use;
- Providing appropriate walking and bicycle riding facilities where required, enhancing accessibility and mobility;
- Improvements to address clusters and patterns of pedestrian and bicycle rider accidents, to address safety issues; and
- Active transport routes that complement 'Safer Routes to Schools' projects and Local Area Traffic Management schemes.

An important function of *AT-Strathfield* is to identify pedestrian and bicycle rider needs. The Plan also indicates Council's goals to meet improvement of pedestrian and bicycle rider needs within the Strathfield Council area.

Pedestrian and bicycle facilities for a range of users including the elderly, the mobility and visually impaired, residents, school children and tourists. *AT-Strathfield* focuses on the pedestrian accessibility and mobility needs and bicycle riding access of Strathfield Council.

2. What is AT-Strathfield

AT-Strathfield is designed to provide a basis for improving walking and bicycle riding, building on the previous *Cycleways Map.* It is a more comprehensive plan that addresses pedestrians and bicycle rider needs throughout the study area. A successful implementation of *AT-Strathfield* would include:

1. Increased use of walking and bicycle riding for transport as measured through the Household Travel Survey (HTS) and Census Journey to Work (JTW), regular bicycle counts and bicycle parking usage surveys;
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5. Completed implementation of a prioritised, costed network that supports Sydney's Walking and Bicycle riding Futures; and
6. Complement the Strathfield's aspirations of urban renewal and revitalisation through investment in high quality public spaces and places.

2.1.1 The Development of AT-Strathfield

AT-Strathfield was developed using the following method (Part A of this report):

- A review of the current *Cycleways Map* and recommend changes and additions to the Strathfield bicycle network, taking into account future bicycle infrastructure proposals in the region including neighbouring Council Active Transport Strategies and Plans, as well as Regional and State bicycle planning documents;
- A review of the current Pedestrian Access Mobility Plan and Community Access Plan and functional pedestrian network, taking into account the likely future pedestrian demand and road safety concerns;
- Identifying existing and likely future activity nodes, desire lines and pedestrian and cycle demand based on residential growth areas;
- Examining world's best practice in the provision of bicycle and pedestrian facilities, shared paths and the integration of bicycle and pedestrian networks into neighbourhoods and major developments;
- Examining Sydney regional best practice in the provision of bicycle and pedestrian facilities, shared paths and the integration of bicycle and pedestrian networks into neighbourhoods and major developments;
- Consultation with community stakeholders, including Bicycle User Groups, other commuter and recreational bicycle riders, any pedestrian user groups, the Senior's interest groups, disabled access interest groups and the wider community to identify, analyse and address the needs, attitudes and safety concerns in regard to pedestrian and bicycle issues in Strathfield;

- Developing a Comprehensive Strategy for the delivery of a safe and useful network of on-road and off-road cycleways, pedestrian paths and shared paths. This strategy includes support facilities and focuses on expanding, improving and providing connections to transport, retail, civic and commercial, education, employment and recreational trip generators with the residential precincts;
- Considering existing and proposed land use residential densities as well as commercial/industrial uses and densities in regard to traffic generators and destinations; and
- Maximising integration with the existing and planned public transport infrastructure in order to facilitate the formulation of an integrated public transport and active transport networks.

AT-Strathfield (Part B of this report) includes:

- A strategy for the provision of bicycle facilities to connect transport nodes, shopping centres, parks and schools;
- A strategy for the provision of pedestrian facilities at transport nodes, shopping centres, parks and schools;
- A prioritised implementation strategy / five-year Action Plan including cost estimates for the proposed Active Transport Plan;
- A wayfinding strategy including an appropriate level of signage and line markings for the various networks (shared and separate paths) which is easy to understand, designed to current standards, consistent in its implementation and does not cause unnecessary street clutter;
- A strategy/program for active transport promotion, awareness and education to raise the profile of bicycle riding and walking in the Strathfield LGA; and
- A list of recommendations and a strategy for incorporating bicycle riding, walking and considerations into other Council planning documents and ensure that outcomes are consistent across Council Departments.

2.2 Study Limitations and Assumptions

This study has been limited by the following:

- No traffic, pedestrian or bike rider counts were undertaken for or provided by Council for this study;
- No unit cost rates were provided by Strathfield Council for pedestrian and bicycle infrastructure. Cost estimates are based on infrastructure unit costs provided from other local council's in NSW.
- Consultation was limited to:
  - Community survey on walking and bicycle riding undertaken in June 2016; and
  - A stakeholder workshop in June 2016; and
  - Consultation with cycle user groups via email and through the online community surveys.

2.3 Report Structure

This report details background information, site observations, recommended treatments and the likely cost of such treatments. Each are dealt with in detail in the following sections of the report:

Part A – Background and Strategy Development Report

Part A of *AT-Strathfield* examines the existing and future context for walking and bicycle riding in the Strathfield LGA to inform the development of the Plan. A review of the relevant state and local government planning policy is provided, which includes guidance on planning for walking and bicycle riding and a review of current Bike Plans for Strathfield and the neighbouring Councils.

Current and future population and employment trends have been reviewed for different localities within the LGA have been reviewed along with travel mode statistics to inform the development of plan and identify areas of priority for improved pedestrian and bicycle infrastructure.

Part A also provides a review of existing walking and bicycle riding conditions, with this review undertaken through a combination of site audits and community and stakeholder consultation. The method and assumptions used for identifying the walking and bicycle networks and infrastructure are also provided in Part A of the Plan.

Part B – AT-Strathfield, An Active Travel Plan for Strathfield

Based on the information outlined in Part A, Part B identifies improvements to support walking and bicycle riding, including proposed networks and infrastructure. The walking and bicycle routes and proposed infrastructure have been costed and prioritised to provide direction to Council on how to deliver the initiatives developed as part of *AT-Strathfield*. An investigation of funding sources is also provided to help achieve this.

Recommended walking and bicycle riding promotion and behaviour change programmes to encourage walking and riding in Strathfield are provided along with proposed methods for evaluating the success of the plan. Additional considerations such as maintenance, potential monitoring criteria, bicycle parking and other measures to increase walking and bicycle use are also discussed.

PART A – BACKGROUND AND INVESTIGATIONS REPORT

3. Introduction

Part A of *AT-Strathfield* provides a review of the existing and future context for walking and bicycle riding in the Strathfield LGA to inform the development of the Plan.

Part A is structured as follows:

- **Section 4 Walking and Bicycle Riding in Strathfield** provides context for existing walking and bicycle riding in the Strathfield LGA;
- **Section 5 Growing Strathfield** provides a review of background information including state planning policy documents, population and employment forecasts and a review of bicycle planning for the surrounding Council LGAs;
- **Section 6 Planning for Pedestrians** provides some introductory guidance on planning for walking;
- **Section 7 Planning for Bicycle Riders** provides some introductory guidance on planning for bicycle riding;
- **Section 8 Consultation** describes the consultation process undertaken and consultation outcomes for this project;
- **Section 9 Existing Facilities Audit** outlines the existing status of walking and bicycle riding conditions and facilities in Strathfield; and
- **Section 10 Network Development** describes the methodology used for identifying the needs of bicycle riders and the bicycle network development and outlines the assumptions for the strategic cost estimates for proposed infrastructure.

4. Walking and bicycle riding in Strathfield

This section provides context for existing walking and bicycle riding trends in the Strathfield LGA, including pedestrian and bicycle rider crashes, population and employment statistics and travel mode share trends. A review of the relevant local government planning policy is also provided, including current Bike Plans for Strathfield Council and the neighbouring Councils.

4.1 Land Use and Population

4.1.1 Land Use

Strathfield Town Centre, located to the northeast of the LGA, is the commercial centre of the LGA and has town centre uses including retail, residential and employment. The local centres in the Strathfield LGA include Homebush, Flemington, North Strathfield and South Strathfield. Areas of mixed use development include along Parramatta Road and around Homebush and Flemington Stations.

Sydney Markets are located to the north of Flemington Station, with pedestrian / bicycle access provided from the Flemington Station. Sydney Olympic Park is located to the north of the LGA, with mainly industrial land uses provided along the western boundary of the LGA.

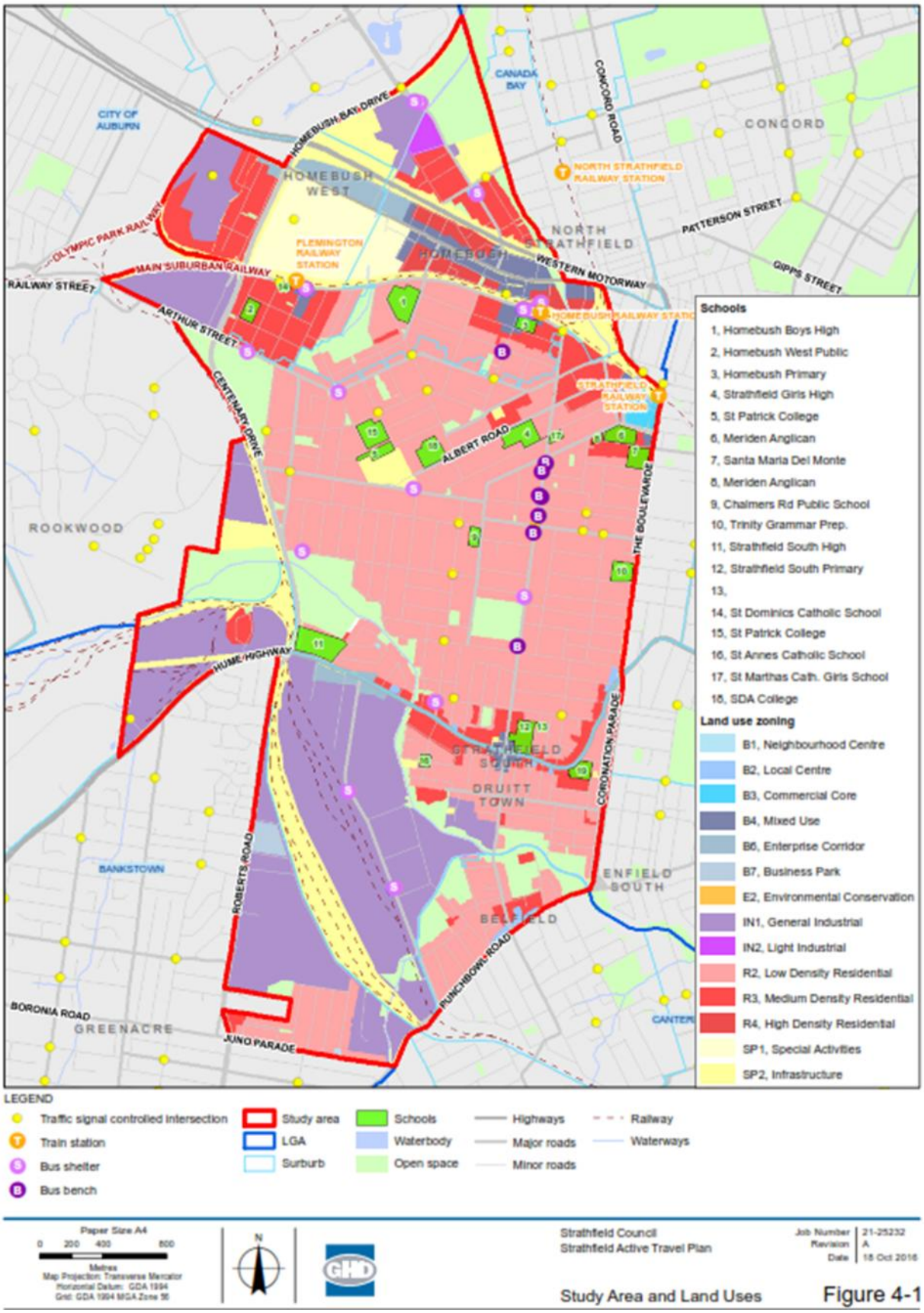
Strathfield has a mix of settlement, with dense urban populations around Strathfield, North Strathfield, Homebush and Flemington Stations. The remainder of the council areas is largely single unit developments (houses). These differences in population settlement lead to differences in mobility, with the more-dense locations more amenable to walking as transport and residents in the suburban locations finding cars easier to use.

The Strathfield Council Local Government Area (LGA) is ideally suited to have a high mode share of bicycle riding and walking for the following reasons:

- The terrain is generally very flat which makes bicycle riding more attractive;
- There are existing recreational walking and bike riding routes through the LGA, including along the Cooks River and Powells Creek at Mason Park;
- The entire LGA is within a 5 km bicycle riding catchment from Strathfield and rail stations at Flemington, Strathfield, North Strathfield and Homebush Stations; and
- The majority of residential areas are within a 2 km walk from Strathfield or a local centre.

The study area includes the Strathfield Council LGA, as shown in Figure 4-1 .

Figure 4-1 Study Area and Land Uses

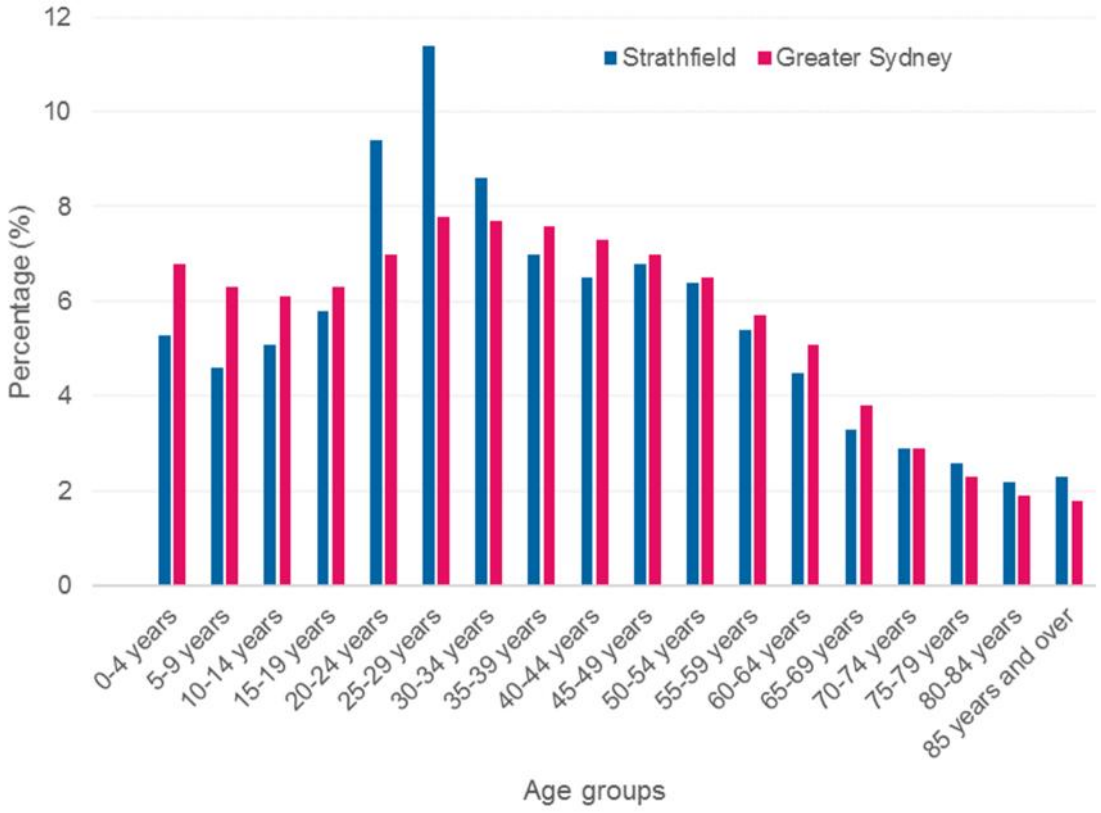


4.1.2 Population

Current Population

Approximately 40,000 people currently live within Strathfield Council. The age group profile of Strathfield and the average age profile for Greater Sydney is shown in Figure 4-2, which is based on 2011 census data from the Australian Bureau of Statistics.

Figure 4-2 Comparison of age profiles in Strathfield and Greater Sydney 2011



Source: Australian Bureau of Statistics, Census of Population and Housing 2011

The current age profile statistics indicate the following:

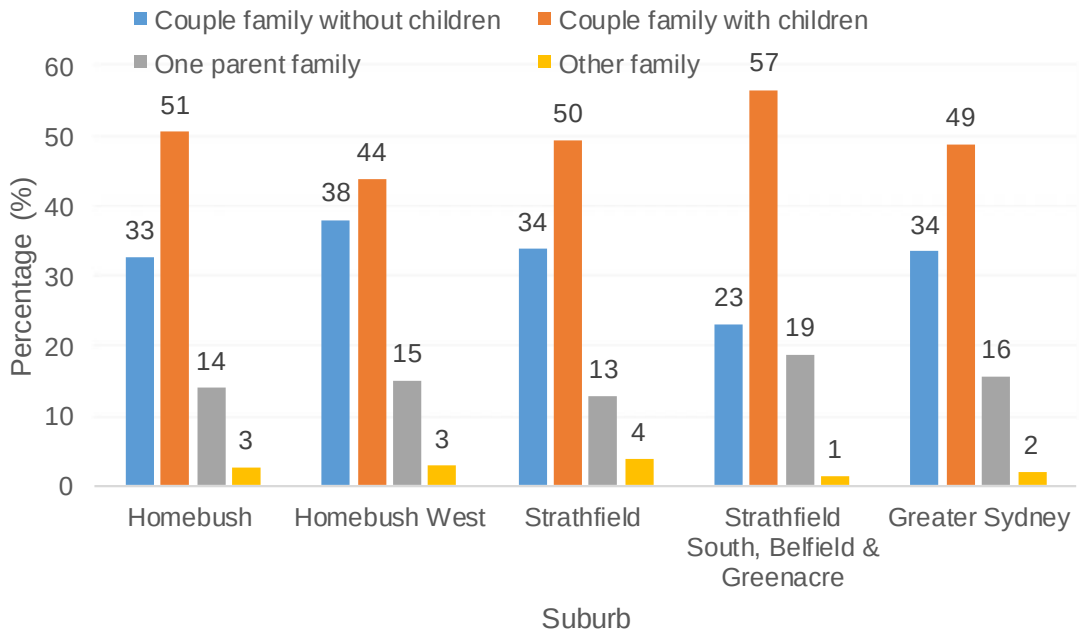
- The proportion of age groups between 20 and 34 years old is higher in the Strathfield LGA than compared to the Greater Sydney average, with this age group consisting of 29 percent of the population in Strathfield and 22 percent for Greater Sydney.
- The proportion of residents aged between 75 and older in Strathfield is also higher than that of Greater Sydney.
- The proportion of residents in Strathfield aged between 0 and 19 is lower than that of Greater Sydney, with this selection of age groups consisting of 21 percent of the population in Strathfield compared to 26 percent in Greater Sydney.
- The proportion of residents aged between 35 to 69 is lower the Strathfield LGA compared to Greater Sydney, with this selection of age groups consisting of 40 percent in Strathfield compared to 43 in Greater Sydney.

The age profile information shows that approximately 35 percent of the population is between 15 and 39. Teenagers above 14 who can be independent, but are too young to drive can achieve some independence through the use of walking, bicycle riding and public transport. Singles and couples in their twenties and thirties can build active transport into their daily

regimes, reducing the need to dedicate time to exercise before travel with children impacts on their mobility choices.

A review of the 2011 census data from the Australian Bureau of Statistics has been undertaken to review the family status of residents within the Strathfield LGA and is shown in Figure 4-3.

Figure 4-3 Family Status in Strathfield LGA - by Suburb



Source: Australian Bureau of Statistics, Census of Population and Housing 2011

The family status profile statistics indicate the following:

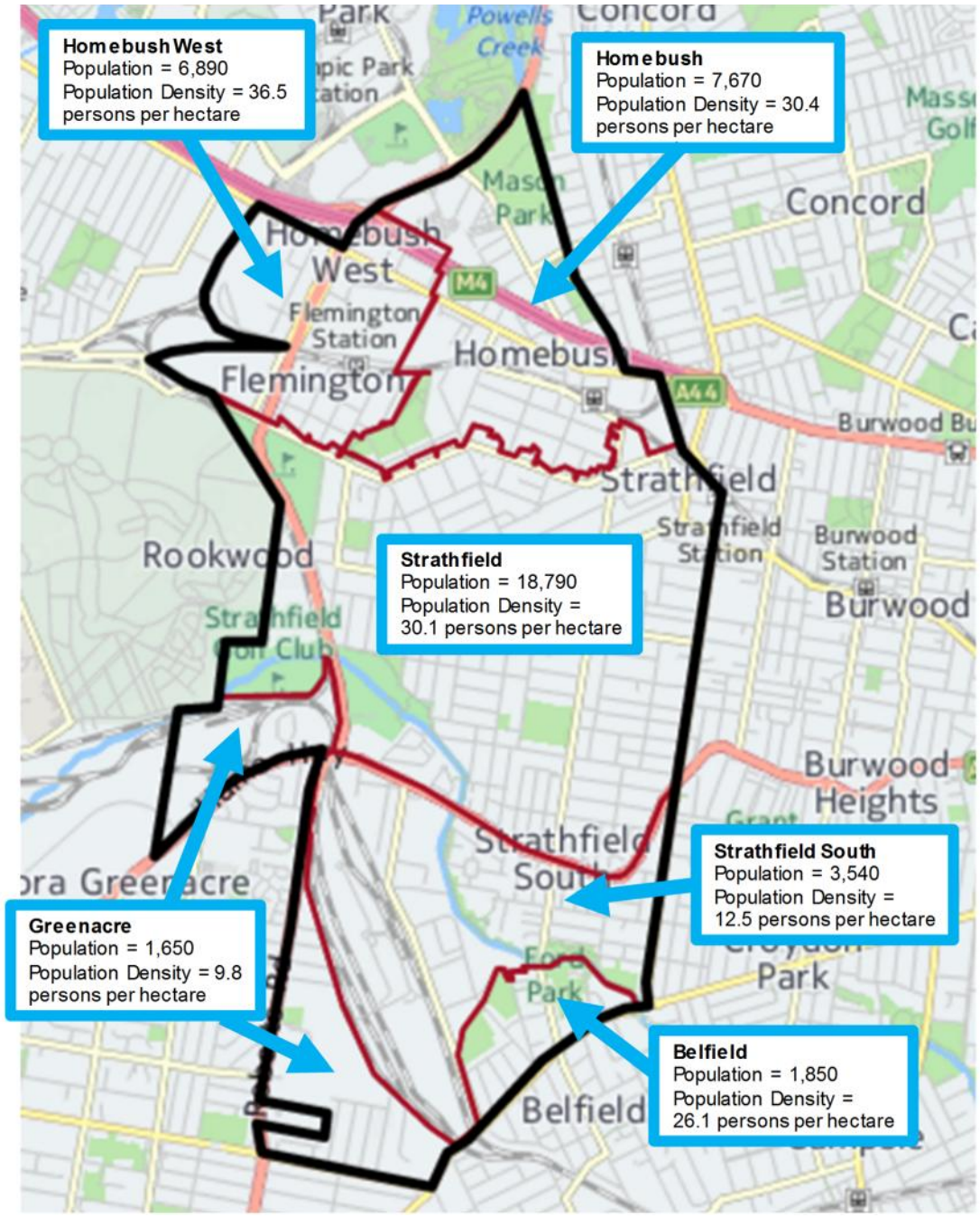
- The southernmost suburbs in the LGA have the highest proportion of families with children, with the “couple family with children” category with 57 percent and the “one parent family” category with 19 percent
- Homebush West has the highest proportion of the “couple family without children” category, with 38 percent.
- The highest category for all suburbs is “couple family with children”, which ranges between 44 percent (Homebush West) and 57 percent (Strathfield South, and Greenacre). The proportion of “couple family with children” for the Strathfield and Homebush suburbs is similar to the Greater Sydney average, at around 50 percent.

Population Density

The population of the Strathfield Council LGA is around 40,000 people. The Council area has a land area of 1,389 hectares, with a population density of 25.3 persons per hectare.

A summary of the population densities within the different suburbs is shown in , which indicates that there are higher population densities in the northern areas of the LGA. These areas are also ideal for encouraging access by walking and bicycle riding as the areas are located close to the town centres and rail stations.

Figure 4-4 Population Density in Strathfield LGA



Source: http://profile.id.com.au/strathfield/about (modified by GHD)

The denser urban areas around the railway stations support walking and bicycle riding, with facilities, shops and public transport within 5 minutes' walk / cycle of home.

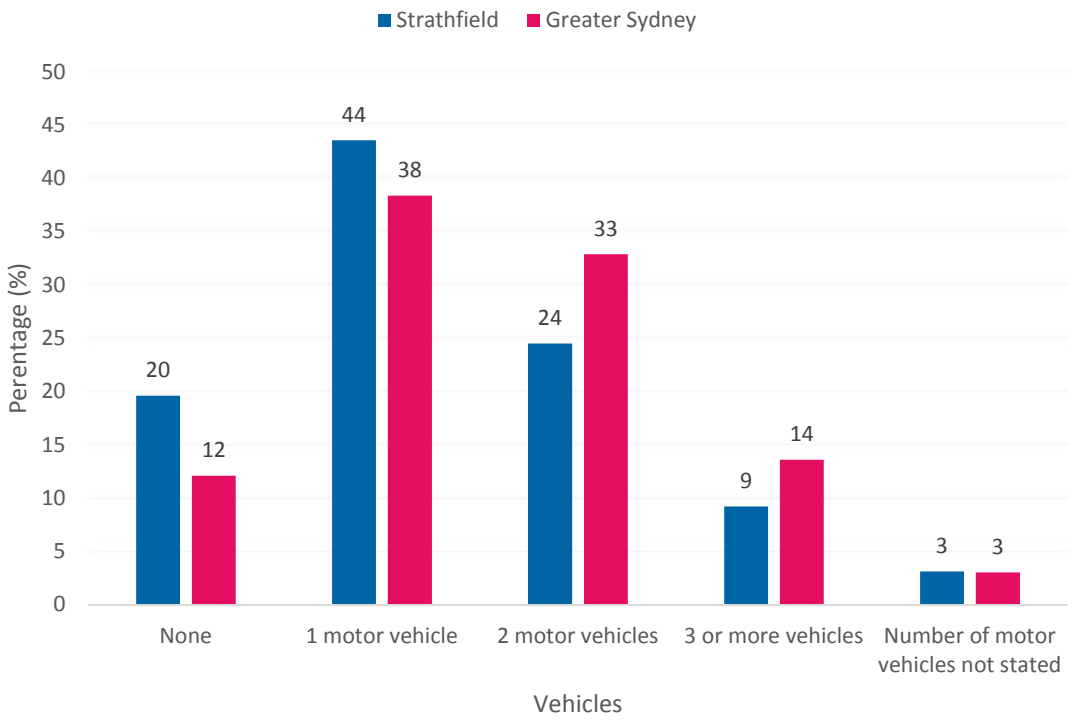
4.1.3 Car ownership

Data for the number of motor vehicles parked at residential addresses in the Strathfield LGA and Greater Sydney is summarised in Table 4-1. This indicates the following:

- 20 percent of households in Strathfield LGA do not have a motor vehicle, compared to 12 percent in Greater Sydney;
- 44 percent of households in Strathfield LGA have one vehicle, compared to 38 percent in Greater Sydney; and

- 37 percent of households in Strathfield LGA have two or more vehicles, compared to 50 percent in Greater Sydney.

Figure 4-5 Motor vehicle ownership



Source: Australian Bureau of Statistics, Census of Population and Housing 2011

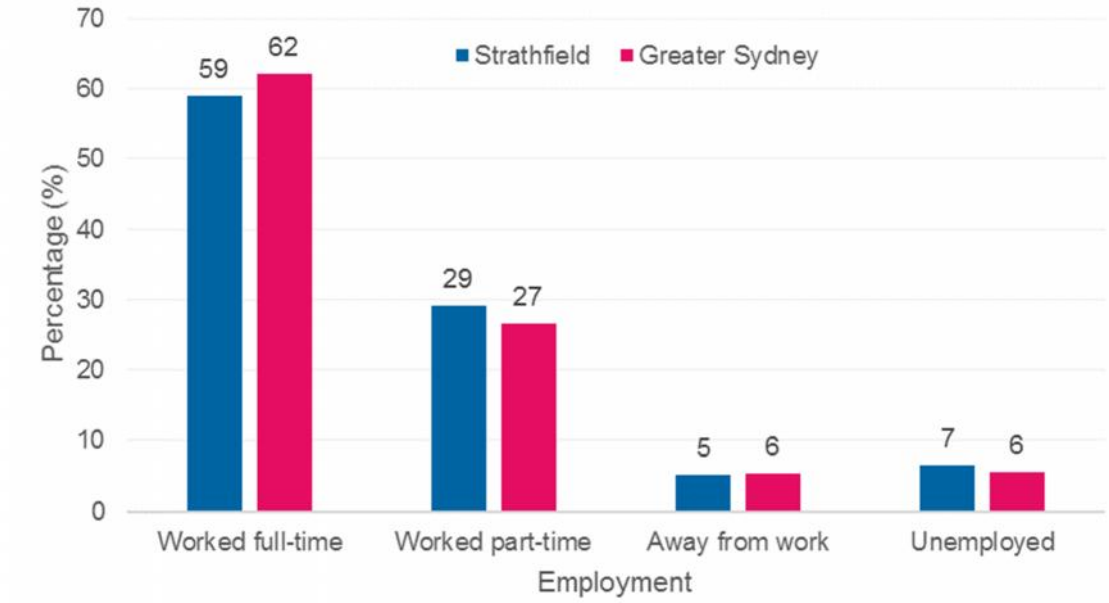
The 64 percent of households with one vehicle currently

4.1.4 Employment

Approximately 25,000 people are currently employed within the Strathfield LGA.

Analysis of current labour force statistics is shown in Figure 4-6. When compared to Greater Sydney, the proportion of Strathfield residents who are employed full time is lower than Greater Sydney. However, the proportion of workers employed part-time is slightly higher. The proportion of people unemployment in the Strathfield LGA is similar to the Greater Sydney average.

Figure 4-6 Labour force statistics



Source: Australian Bureau of Statistics, Census of Population and Housing 2011

4.2 Existing Travel Characteristics

Travel within the Strathfield LGA is currently dominated by the use of private cars. However, a high proportion of journeys to work are also undertaken by train, with Strathfield, Strathfield North, Homebush and Flemington Stations located in the northern section of the LGA.

4.2.1 Transport usage statistics

Household Travel Survey

Data from the *2012/2013 Household Travel Survey* (HTS) was obtained from the Bureau of Transport Statistics (BTS) and was assessed for Strathfield LGA. This data provides estimates for trips made on an average weekday. Table 4-1 provides a summary of the travel mode shares in Strathfield.

The data indicates that 23 percent of all trips are undertaken by walking only, supporting the case for improved facilities for pedestrians. Journeys made by bicycle are included within the 'Other modes' category which accounts for one percent the travel mode share in Strathfield.

Table 4-1 HTS Data for Strathfield

Means of transport	Mode Share (%)	Trips	Total Distance Travelled (km)	Average Distance Travelled (km)
Driver	45%	59,000	473,000	8.0
Walk Only	23%	29,000	21,000	8.2
Passenger	15%	19,000	155,000	11.4
Train	12%	16,000	183,000	4.3
Bus	4%	6,000	26,000	0.7
Other Modes	1%	1,000	4,000	4.0

Source: 2012/13 five-year pooled Household Travel Survey (HTS)

Journey to Work Data

Journey to Work (JTW) data from the *2011 TDC JTW Summary Tables by LGA* from BTS (2011) has been assessed for the different suburbs in Strathfield LGA. A summary of the mode share data for each suburb is shown Figure 4-7 to Figure 4-10.

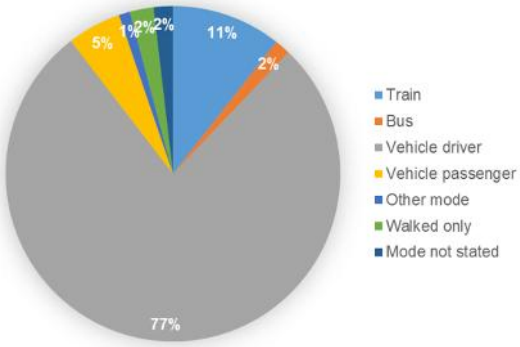
Data for Strathfield indicates a high mode share for private vehicle travel, particularly in the southernmost suburbs of the LGA.

Travel by public transport has a higher mode share in the northern suburbs with 41 percent of residents travelling by public transport in Homebush. However, travel by public transport for people working within each area is much lower than residents of each suburb.

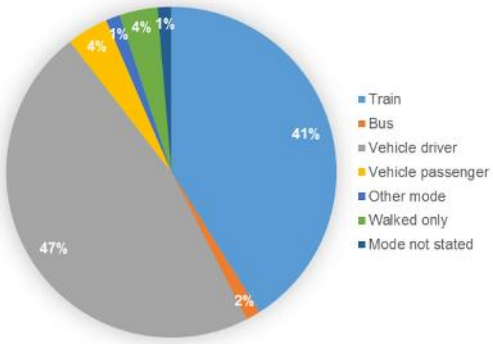
Bicycle riding journeys accounted for around one or two percent for each suburb. Walk only journeys accounted for up to four percent for residents and up to seven percent for people employed (in the Strathfield suburb). This is similar to the Greater Metropolitan Area of Sydney (GMA) averages of two percent for bicycle journey and four percent for walk only.

Figure 4-7 JTW Data - Homebush

Employees in Homebush



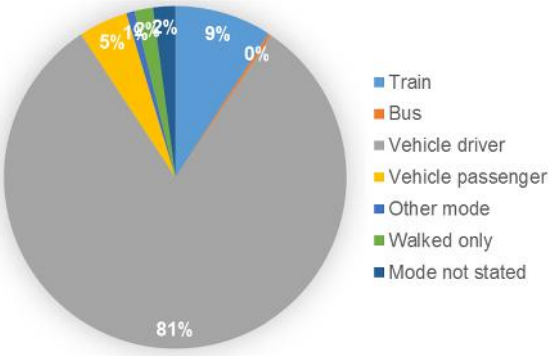
Residents in Homebush



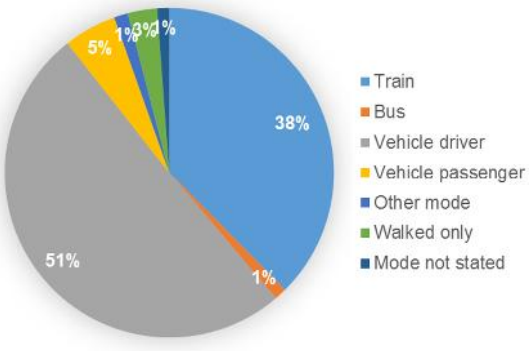
Source: *http://visual.bts.nsw.gov.au/tz/#963,966,958,965*

Figure 4-8 JTW Data – Homebush West

Employees in Homebush West



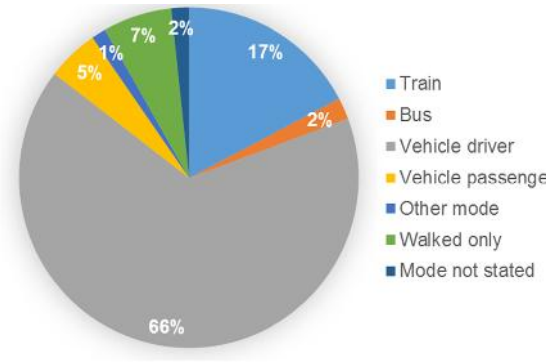
Residents in Homebush West



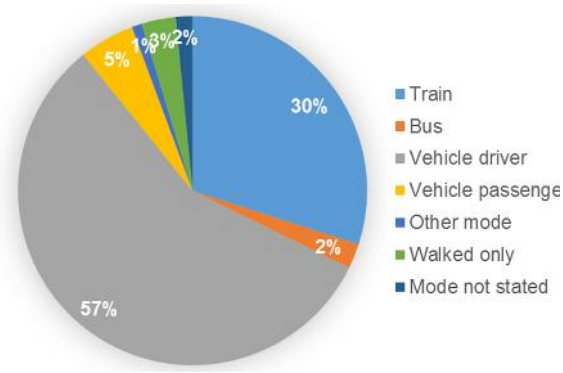
Source: *http://visual.bts.nsw.gov.au/tz/#962,959,960,961,964*

Figure 4-9 JTW Data - Strathfield

Employees in Strathfield



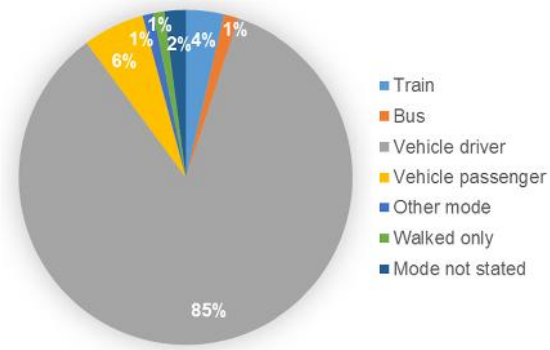
Residents in Strathfield



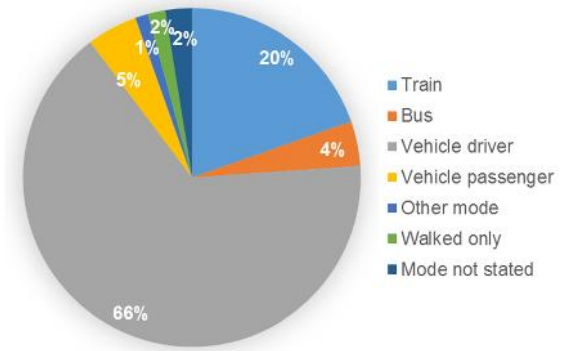
Source: http://visual.bts.nsw.gov.au/tz/#981,982,979,977,973,974,972,978

Figure 4-10 JTW Data – Strathfield South, Belfield and Greenacre

Employees in Strathfield South, Belfield and Greenacre



Residents in Strathfield South, Belfield and Greenacre

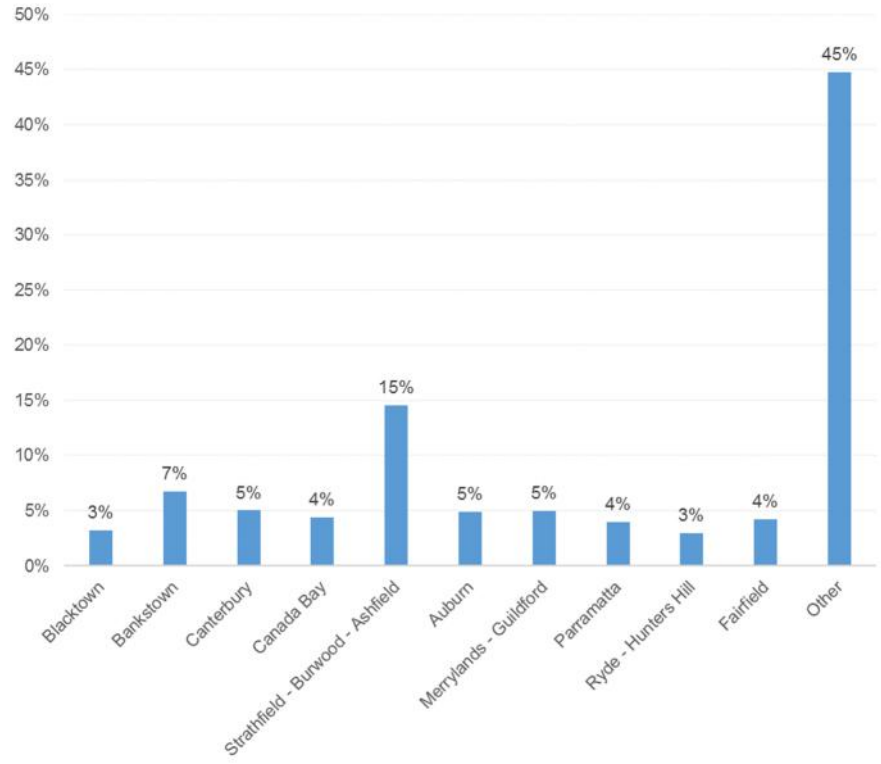


Source: http://visual.bts.nsw.gov.au/tz/#984,2500,983,976

Residential Locations of Employees

Locations of where peopled employed in Strathfield LGA live are shown at Figure 4-11. This indicates that 36 percent live within the Strathfield LGA and the surrounding LGAs (Burwood, Canterbury Bankstown, Canada Bay and City of Cumberland), within a walking or bicycle riding distance.

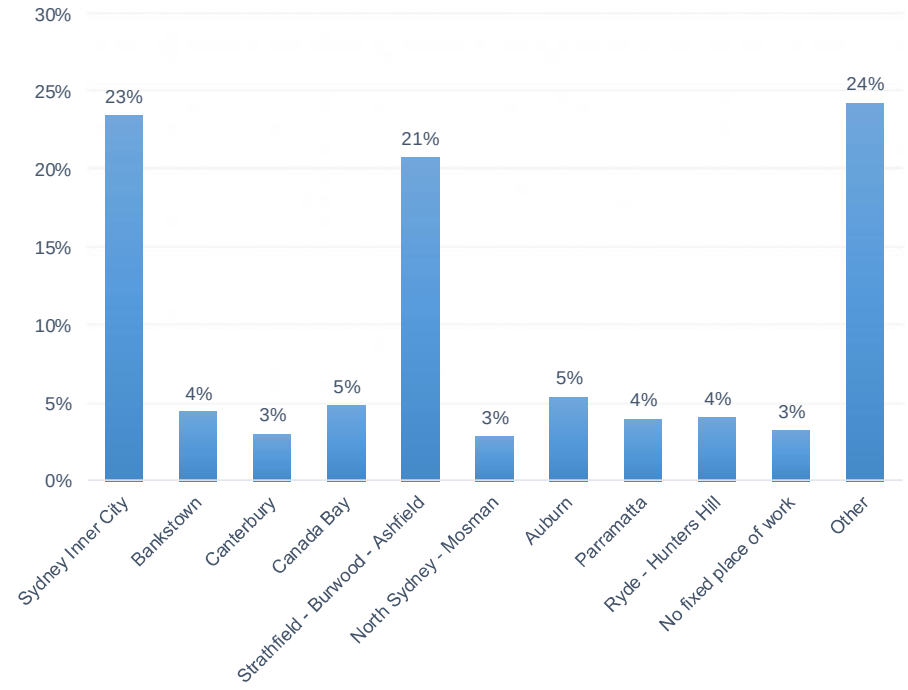
Figure 4-11 Locations where Employees in Strathfield LGA are Travelling from



Source: http://visual.bts.nsw.gov.au/tz

Locations of where resident of the Strathfield LGA are travelling to work are shown at Figure 4-12. This indicates that 38 percent are work within the Strathfield LGA and surrounding LGA (Burwood, Canterbury, Canada Bay, Auburn and Bankstown), within a walking or bicycle riding distance.

Figure 4-12 Locations Where Employed Residents are Travelling to

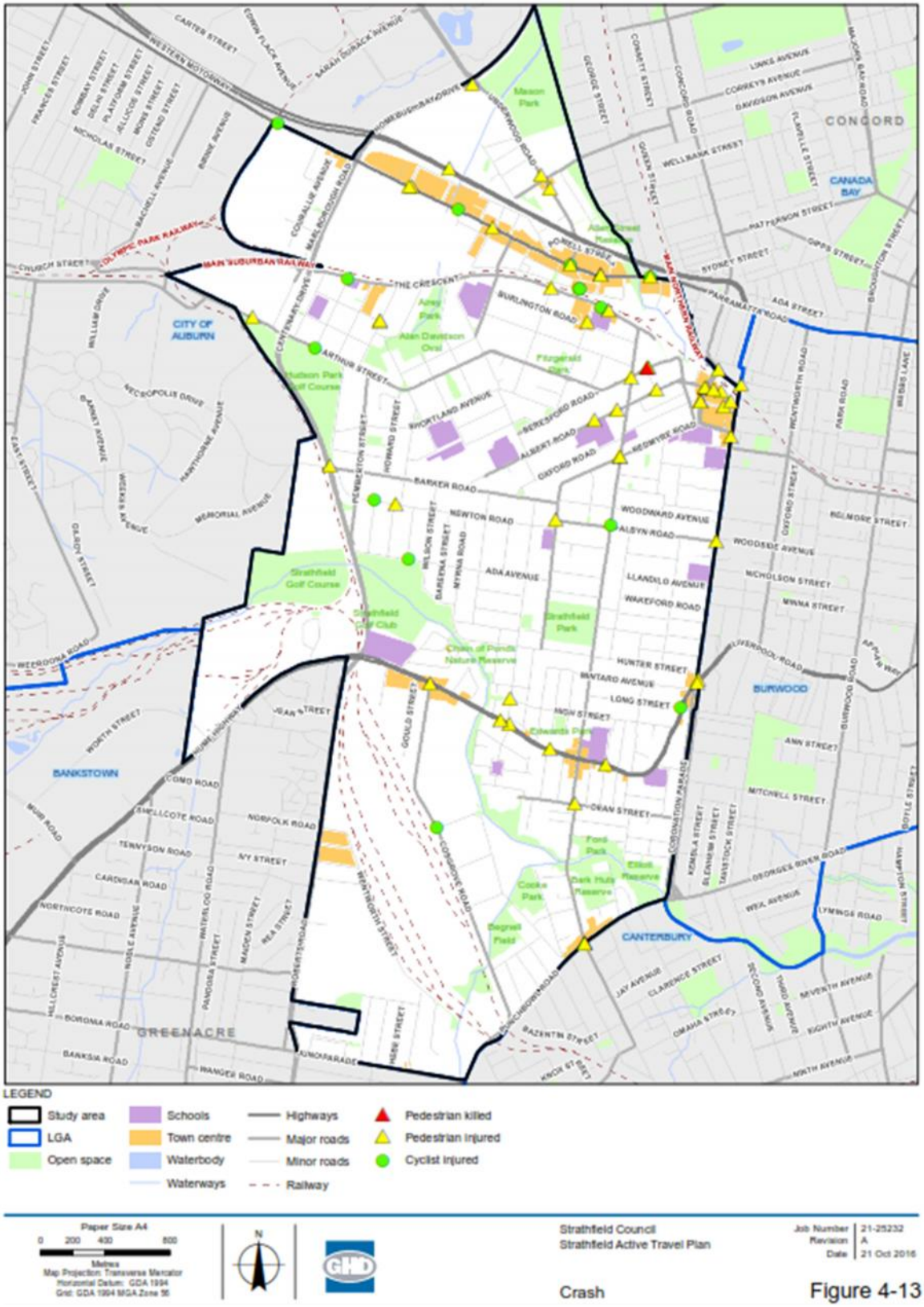


Source: http://visual.bts.nsw.gov.au/tz

4.3 Crash Review

Pedestrian and bicycle crash data was obtained from Strathfield LGA study area for a five-year period between 2010 and 2014. The locations of these crashes is shown in Figure 4-13.

Figure 4-13 Location of Pedestrian and Bike rider Crashes (2010-2014)



Bicycle Riders

A summary of the crashes involving bicycle riders is provided in Table 4-2, with the locations of these crashes shown at Figure 4-13. The data shows that there have been 18 crashes causing injuries. Of these crashes, there was a result of 18 injuries with the crash at North Strathfield on the Great Western Highway resulting in two injuries. All other crashes involving cyclists resulted in one injury. No fatalities were recorded during this period.

The suburbs with the highest number of bicycle crashes include:

- Homebush, with seven bicycle crashes; and
- Strathfield, with five bicycle crashes.

Table 4-2 shows that 13 of the 18 reported bicycle crashes were of type that would be eliminated through the provision of separated bicycle paths for bicycle riders. This indicates that separation of bicycles from the general traffic for key bicycle links is likely to improve safety for bicycle riders.

Table 4-2 Bicycle Crash Statistics for the period between 2010 – 2014

Suburb	Street	Location	Location / Nearest Intersecting Street	Time of day	Type	Injuries
Homebush	Underwood Road	Midblock	Homebush Bay Road	AM	Leaving parking*	1
Homebush	Great Western Highway	Intersection	Underwood Road	PM	Left turn sideswipe*	1
Homebush	Subway Lane	Intersection	Loftus Lane	AM	Left turn sideswipe*	1
Homebush	Hornsey Road	Intersection	The Crescent	AM	Rear end*	1
Homebush	Potts Street	Intersection	Great Western Highway	PM	Left turn* sideswipe	1
Homebush	Loftus Crescent	Intersection	Subway Lane	AM	Right through*	1
Homebush	The Crescent	Midblock	Rochester Street	AM	Right rear*	1
Homebush West	Arthur Street	Intersection	Hornsey Road	PM	Right through*	1
Homebush West	Great Western Highway	Midblock	Driveway at property number 378	PM	Emerging from driveway	1
North Strathfield	Great Western Highway	Intersection	George Street	PM	Pedestrian nearside	2
Strathfield	Centenary Drive	Intersection	Arthur Street	PM	Rear end*	1
Strathfield	Hume Highway	Intersection	Long Street	PM	From footpath	1
Strathfield	Ada Avenue	Midblock	Myee Avenue	PM	Other same direction*	1
Strathfield	Homebush Road	Intersection	Albyn Road	PM	Cross traffic	1
Strathfield	Melville Avenue	Intersection	Newton Road	AM	Right rear*	1
Strathfield South	Centenary Drive	Midblock	Hume Highway	PM	Rear end*	1
Strathfield South	Cosgrove Road	Intersection	Cleveland Street	AM	Left near*	1
Total						**18**

**indicates type of crash eliminated through the use of separated cycleways.*

Pedestrians

A summary of the crashes involving pedestrians is provided in Table 4-3, with the locations of these crashes shown at Figure 4-13. The data indicates that over the five-year period there were 52 crashes involving pedestrians which resulted in injuries and one crash resulting in a fatality.

The majority of crashes resulted in one injury with the exception of two incidents, including one crash at Punchbowl Road and another crash which occurred in at Beresford Road resulting in one fatality. This crash type involved the pedestrian walking across the carriageway where the vehicle was proceeding.

The data also indicates that there have been a cluster of crashes involving pedestrians around the Strathfield Plaza and Strathfield Station area, where 15 crashes were recorded over the five-year period.

Further investigation of pedestrian safety and review of pedestrian infrastructure and conditions should be undertaken for the Strathfield and Homebush suburbs. This could be done through the development of a detailed Pedestrian Access and Mobility Plan (PAMP) for key pedestrian activity precincts within these suburbs.

Table 4-3 Summary of Pedestrian Crash Locations by Suburb

Suburb	Injuries	Fatalities
Belfield	4	0
Flemington	1	0
Homebush	11	0
Homebush West	1	0
Strathfield South	4	0
Strathfield	29	1
Homebush West	3	0
Total	**53**	**1**

The types of crashes involving pedestrians over the five years is summarised in Table 4-4. The data shows that a significant amount of crashes occurred when pedestrians were crossing the road or carriageway, with 31 crashes resulting in an injury and one fatality crash recorded over the five-year period.

This indicates that consideration should be given to improving pedestrian crossings facilities at a number of key locations in the study area, including at:

- Liverpool Road, where six crashes involving pedestrians along this road;
- Parramatta Road, where five crashes involving pedestrians along this road; and
- Strathfield Town Centre, where around ten crashes involving pedestrians; and
- Homebush, where there were nine crashes involving pedestrians.

Table 4-4 Summary of Crash Types involving Pedestrians

Type	Injuries	Fatalities
Car reversed parked into pedestrian across carriageway	1	0
Car reversed into pedestrian across carriageway	1	0
Car reversed into pedestrian near driveway	2	0
Pedestrian emerging	4	0
Pedestrian running across carriageway	4	0
Pedestrian standing on carriageway	3	0
Pedestrian stepping off/onto kerb	2	0
Pedestrian stepping off/onto median	1	0
Pedestrian walking across carriageway	31	1
Pedestrian walking with traffic	2	0
Pedestrian working on carriageway	3	0
Total	**53**	**1**

4.4 Strathfield Council Plans, Strategies and reports

Strathfield Council Annual Report 2014-2015

The *Strathfield Council Annual Report 2014-15* is a report which details the Council's performance against targets set out in its Delivery Program for the year. Targets are based off of goals and strategic directions that Council aims to reach in order to benefit the local community.

One of the goals that were put forward in the report is the improvement of Recreation and Open Spaces. Council identified that one of the strategic directions that it will focus on to achieve this goal is to maintain and improve opportunities for non-structured recreation in the form of walking and bicycle riding.

Council ran programs regarding pedestrian safety and safe walking workshops, these being *Slow Down in Strathfield, Pedestrian Safety, Child Restraint and GLS Workshop and Safety Outside Schools.* As a component of the school holiday program council ran a bicycle safety day along with a safe bicycle riding program during bike week.

Strathfield Development Contribution Plans Section 94 and 94A

The Strathfield Development Contribution Plans: Direct Development Contributions Plan 2010-2030 and Indirect Development Contributions Plan fall under Section 94 and Section 94A of the Environmental Planning and Assessments Act 1979 (EP&A Act) respectively.

The Direct Development Contributions Plan 2010-2030 provides the administrative framework that enables councils to levy contributions to fund additional or upgraded public facilities and infrastructure such as traffic and community facilities required as a result of development and the increased demand this generates.

The Indirect Development Contributions Plan provides the administrative framework that enables councils to levy on particular development to cater for the increased demand on public facilities.

Cooks River Pedestrian and Cycle Path: Improvement Study - Pathway Development Strategy

The Cooks River Path is generally an off-road shared path, which extends from Homebush Bay in the west to Botany Bay in the east. The pathway development strategy investigates and identifies safety, access and other issues in order to determine ways of improving the walking and bicycle riding environment.

Some of the main issues brought up within the study include:

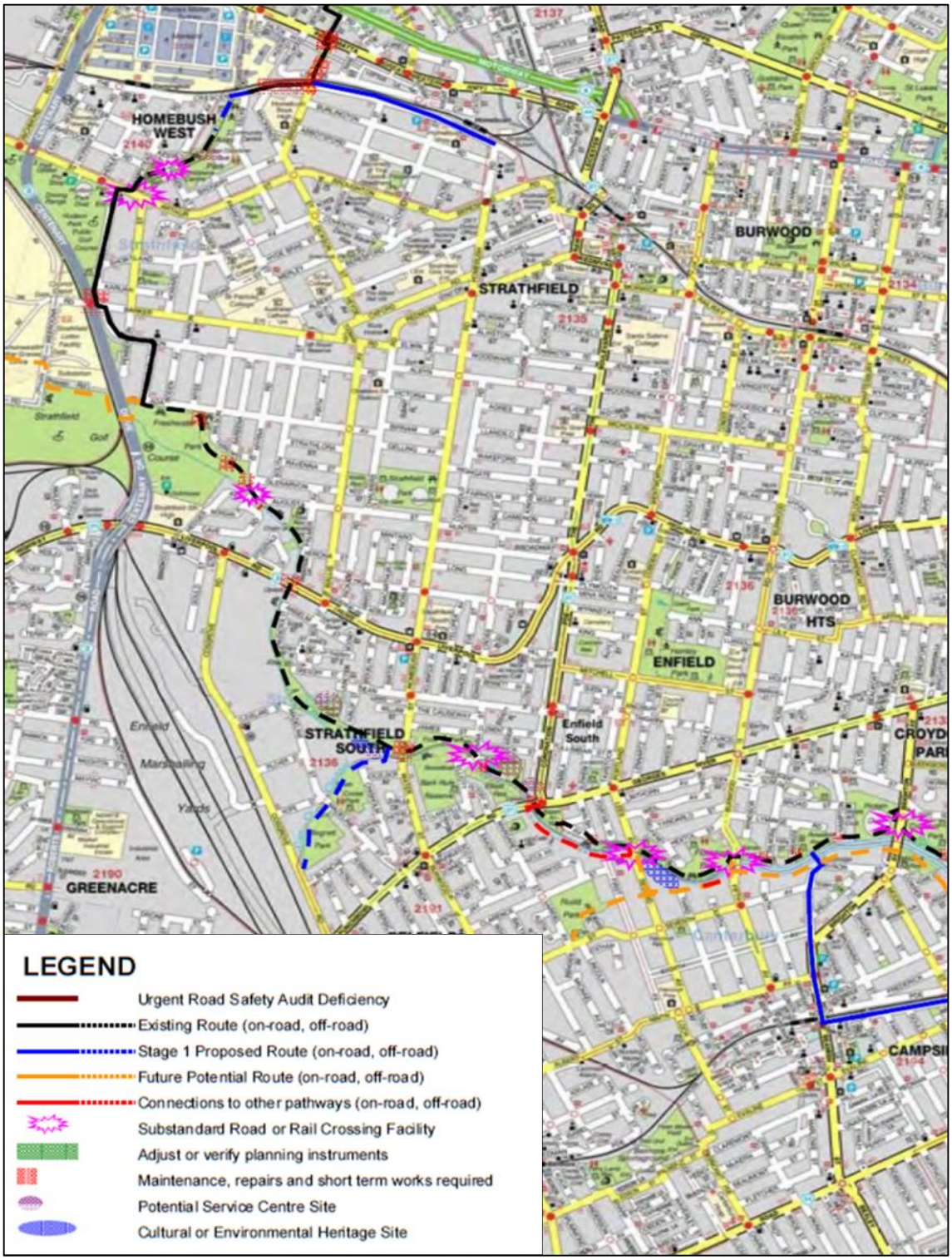
- Multiple user groups and shared pathways;
- Sub-standard and unsuitable road and rail crossings;
- Cultural and environmental heritage features which could both enhance or constrict future developments; and
- Further developments required for improvements with accessibility.

The Pathway development strategy is summarised in Figure 4-14, which shows both the existing network and proposed future networks for the western side of the Cooks River pathway. The plan includes the following elements:

- High priority works to address urgent road safety audit findings;
- Improvements to the Existing Route;

- Stage one of Proposed Routes and Improvements; and
- Future Routes and Improvements.

Figure 4-14 Cooks River Foreshore Pathway – Strathfield and Homebush



The report provides a detailed description of recommended route improvements for each section of the pathway. The following are specific for Strathfield:

Bicentennial Park to Parramatta Road

- Repair pavement adjacent to Homebush Bay Substation;
- Sign and mark western footpath along Pomeroy Street for shared use from Powells Creek Bridge to M4 Overbridge;
- Improve lighting and signal phasing on Underwood Road / Pomeroy Street;
- Remove bollards / U-rails and improve refuges and kerb extensions on the M4 Overbridge; and
- Improve signalling and lighting along footpaths on Pomeroy Street and George Street respectively near North Strathfield Station.

Parramatta Road to Ada Avenue

- Improve lighting and signal phasing on Parramatta Road / Bridge Road;
- Bridge Road - bicycle shoulder lanes, shared footpath (dual facility to cater for multiple user groups);
- The Crescent – bicycle shoulder lanes from Airey Park to Bridge Road and from Bridge Road to Homebush Road, green bicycle lanes at Bates Road, wide kerb extension with dual kerb ramps at Airey Park;
- Airey Park – short section of new path on east side of the channel to link with The Crescent;
- Fraser Street - widen existing refuge;
- Hampstead Road and Arthur Street – improve bicycle shoulder lanes and shared footpath;
- Kerb extensions on Hampstead Road at Melville Reserve, Arthur Street / Hampstead Road and Arthur Street / Mitchell Road; and
- Centenary Drive / Weeroona Road - gap in noise wall difficult to negotiate, widen gap and path on both approaches.

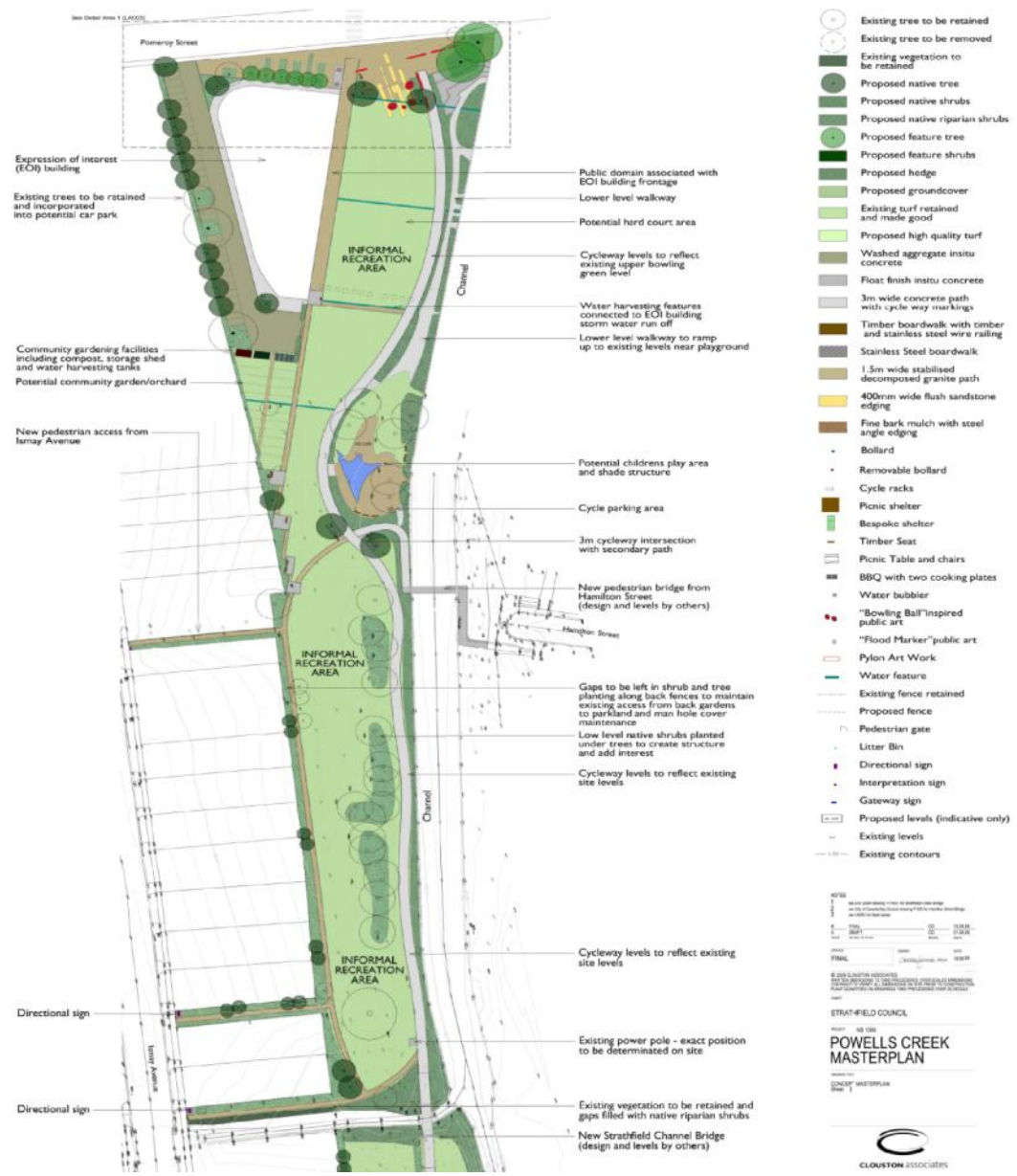
Ada Avenue to Georges River Road

- Improve sightlines along Freshwater Park (3 locations through curves);
- Morgan Place at Augusta Street - raised platform crossing;
- Hume Highway - improve lighting in underpass;
- Improve sightlines and lighting at underpass Water Street;
- Maria Street – at grade crossing with speed humps on both approaches;
- Maria Street carpark – realign path clear off carpark, including a retaining wall and a section of new pathway;
- Coxs Creek to Georges River Road (in conjunction with a pathway along Coxs Creek (Section 5.4.2) – Planning controls for a low key pathway; and
- Maria Street and Water Street - kerb extensions and zebras at both roads.

Powell Creek Masterplan

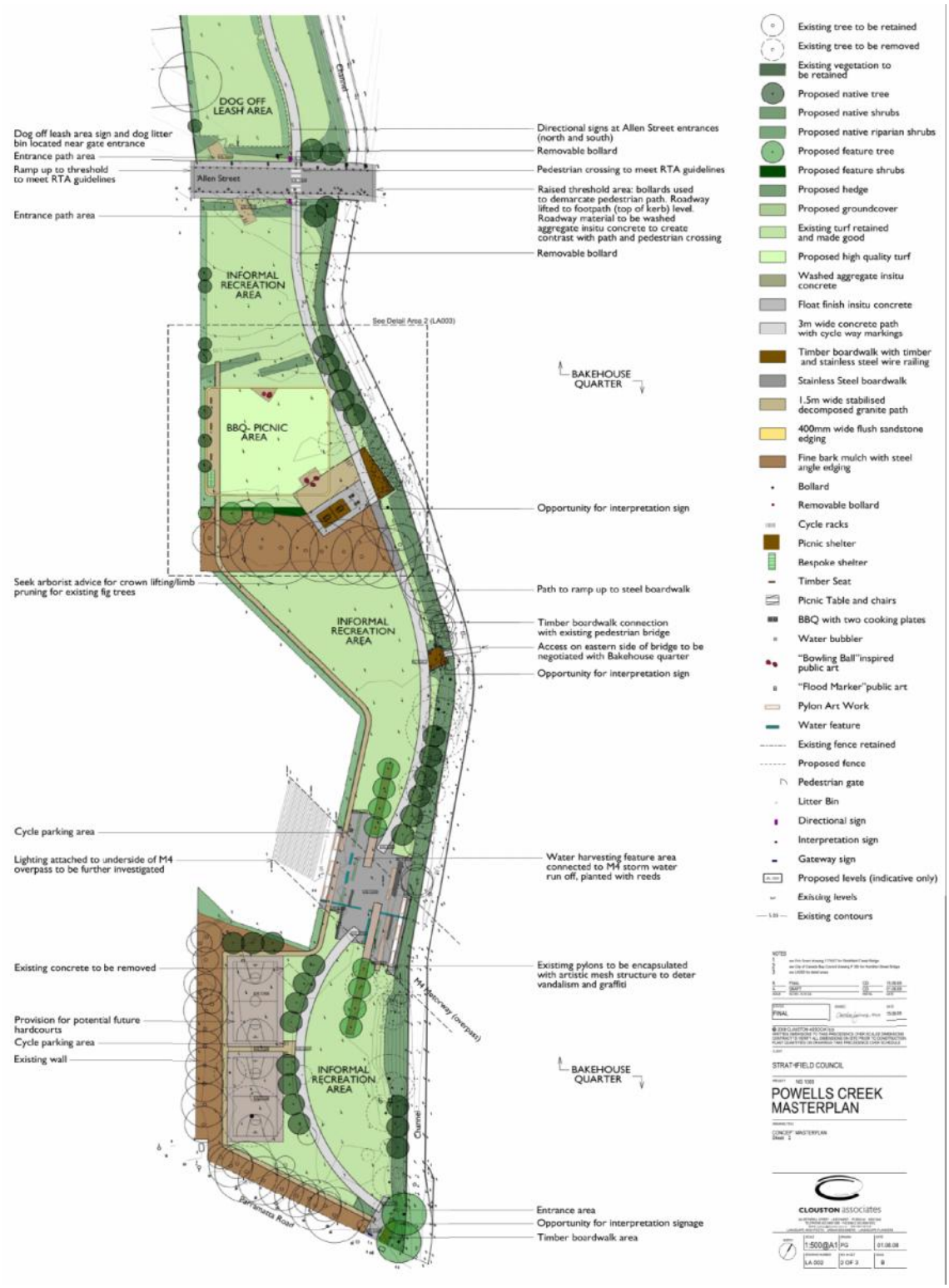
An extract of the Powell Creek Masterplan is shown at Figure 4-15 and Figure 4-16. It will provide improved public amenities along the Powell creek corridor. The cycleway extends the length of the parkway. The council has already installed the Strathfield creek pedestrian / bicycle bridge and a section of shared path.

Figure 4-15 Powell Creek Masterplan – North



Source: Powell Creek Masterplan

Figure 4-16 Powell Creek Master Plan – South



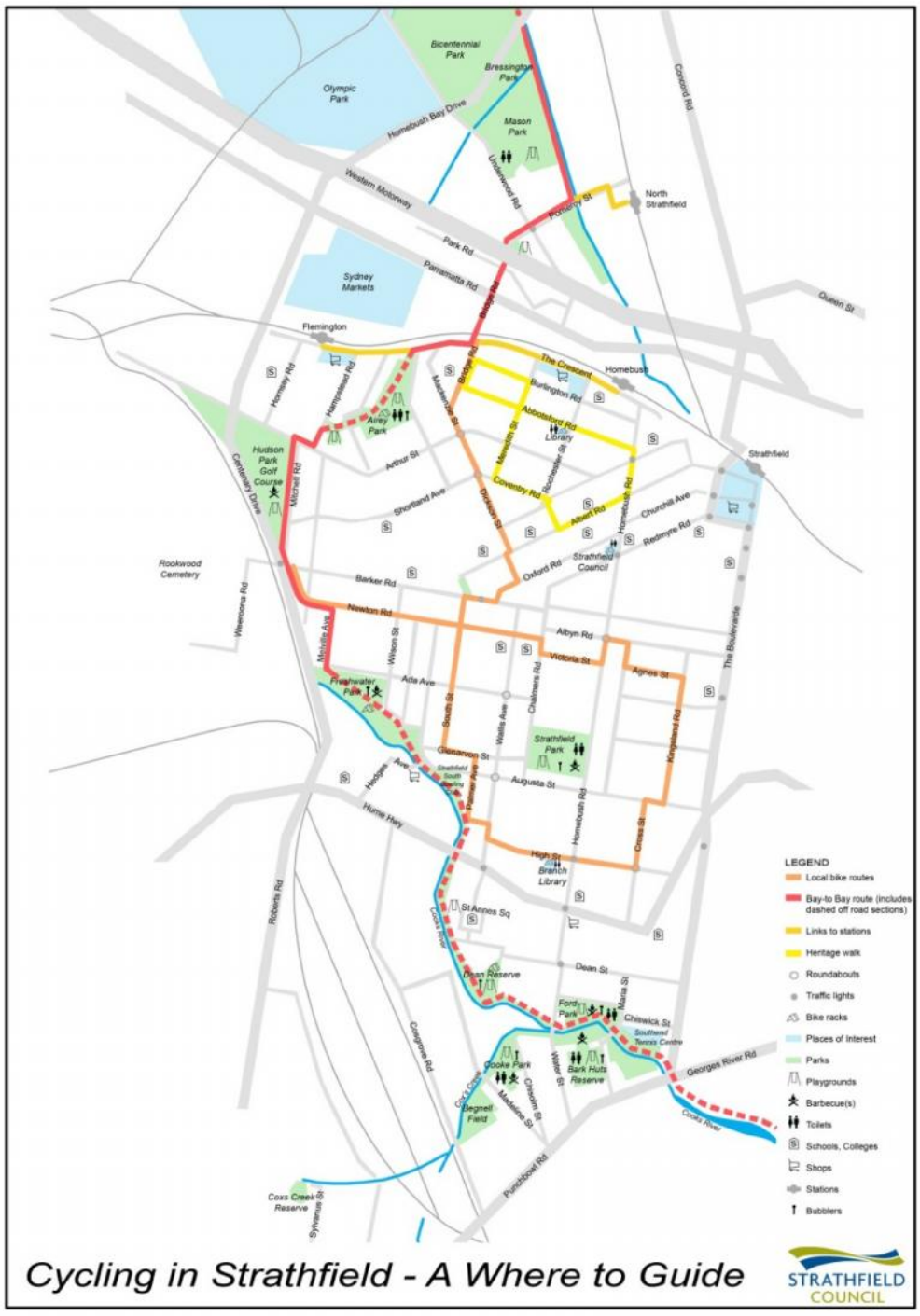
Source: Powell Creek Masterplan

4.5 Existing walking and bicycle riding networks

Bicycle riding in Strathfield – A where to Guide

The *Bicycle riding in Strathfield – A where to Guide* provides the current bicycle riding map and guide in the Strathfield LGA, and is shown at Figure 4-17. The map identifies the Cooks River shared path and a number of on road bicycle routes throughout the LGA. The map does not show any connections to Strathfield Town Centre and Station or to Homebush or Flemington railway stations. It also lacks a connection to Burwood (which is a Major Centre).

Figure 4-17 Strathfield Bicycle riding Network



Source: Bicycle riding in Strathfield – A Where to Guide, Strathfield Council

5. Growing Strathfield

This section provides a review of relevant background information for the future context of Strathfield. This includes a review of state planning policy documents, population and employment forecasts and bicycle plans for the surrounding Council LGAs.

5.1 NSW Government Strategies

Two key strategic transport documents were released by the NSW State Government in December 2013 to promote and improve the safe, convenient and efficient movement of bicycle riding in Sydney, namely *Sydney's Walking Future* and *Sydney's Cycling Future*. These are complementary strategies, as both walking and bicycle riding are active and sustainable forms of transport that do not require fossil fuel and promote healthy living.

The *NSW 2021 State Plan* and *NSW Long Term Transport Master Plan* also set out State Government's objectives for increasing bicycle riding to achieve improved environmental outcomes, health benefits, to reduce traffic congestion and free up capacity on public transport.

5.1.1 NSW 2021 State Plan

NSW 2021 State Plan is State Government's ten-year plan to guide policy and budget decision making and, to deliver on community priorities. It sets long-term goals and targets, and outlines actions that will help achieve these goals.

The key goals for transport outlined in *NSW 2021* are to:

- Reduce travel times;
- Grow patronage on public transport by making it a more attractive choice;
- Improve customer experience with transport services; and
- Improve road safety.

Other aligned goals are:

- Build liveable communities;
- Protect our natural environment;
- Make it easier for people to be involved in their communities; and
- Keep people healthy.

In order to achieve targets for increasing mode share for walking and bicycle riding, the State Government will work with local Councils to complete local walking and cycle networks as part of an integrated transport network.

5.1.2 A Plan for Growing Sydney

A Plan for Growing Sydney, released in December 2014, is the NSW Government's plan for the future of the Sydney Metropolitan Area over the next 20 years. The Plan provides key directions and actions to guide Sydney's productivity, environmental management, and liveability – including the delivery of housing, employment, infrastructure and open space.

The Plan identifies the Parramatta Road as an Urban Renewal Corridor, a location where the NSW Government will focus urban renewal activities to provide additional housing.

5.1.3 NSW Long Term Transport Master Plan

The *NSW Long Term Transport Master Plan* (the Master Plan) was released by Transport for NSW in 2012 and provides a framework to address and support the State's transport needs over the next 20 years, including bicycle riding. The Master Plan will guide the NSW Government's transport funding priorities over the next 20 years, providing the overall framework for the future development of the State's transport system.

A key focus of the Master Plan is to increase bicycle riding and support its integration with public transport, including extensions and improvements to the State's bicycle riding network, better storage facilities and signs, and new interchanges that are attractive activity hubs for local communities.

- Short term:
  - Design new links in off-road pathway networks to provide walkers and bicycle riders with separated space where feasible;
  - Build a connected bicycle riding network within a 5 kilometre catchment of local centres;
  - Provide bike parking at transport interchanges; and
  - Continue to invest in the bicycle riding network with a focus on dedicated bicycle riding paths and pinch point improvements.
- Medium to long term:
  - Continue to extend the catchment of connected bicycle riding networks around local centres in the long term.

The Master Plan states that bicycle trips account for about one percent of all Great Metropolitan Area trips, and about 1.9 percent of all Greater Metropolitan trips under 10 kilometres. Around 90 percent of bicycle trips made each day in Sydney are less than 10 kilometres long, with the average distance being 3.2 kilometres.

Sydney's Walking Future

The actions set out in *Sydney's Walking Future* aim to encourage people to walk by making walking a safer, more convenient and better connected mode of transport. The key objective of the walking strategy is for walking to be the primary transport choice for trips under 2 km and to improve pedestrian access and amenity at interchanges to encourage walking as part of the public transport journey.

Sydney's Walking Future aims to support the integration of walking into the transport system through three pillars of activity:

- Promote the benefits of walking and provide quality information to customers;
- Connect communities by delivering safe walking infrastructure and completing networks; and,
- Engage with partners across the NSW Government, with local government, non-government organisations and the private sector to develop initiatives and policies.

Sydney's Cycling Future

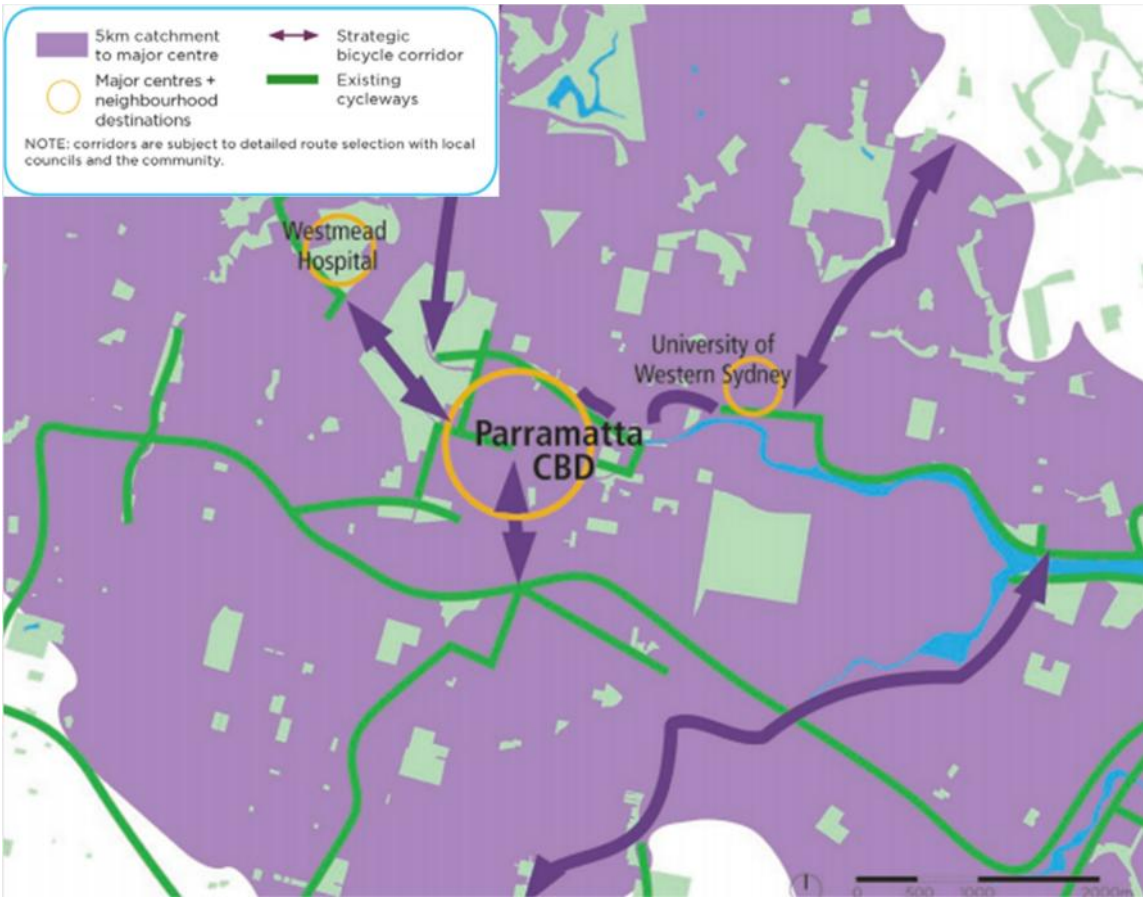
Sydney's Cycling Future committed the NSW Government to work with Local Councils to identify and co-fund bicycle infrastructure to connect local bicycle networks to key destinations. This would focus on completing links within a 5 kilometre catchment of centres and interchanges in the short term and expand to a 10 kilometre catchment in the longer term.

The three pillars of *Sydney's Cycling Future* strategy are:

- Safe, connected networks (which includes but not limited to):
  - Creating connected cycle networks within 5 kilometres of activity centres and public transport interchanges. This could be extended to 10 kilometres in the longer term; and
  - Improve bike parking facilities at public transport interchanges.
- Better use of existing infrastructure, which includes, but is not limited to:
  - Promotion activities;
  - Skills training; and
  - Trip planning.
- Policy and partnerships, which includes but is not limited to:
  - Integration in major urban developments and transport projects; and
  - Partner with local councils and interest groups.

Sydney's Cycling Future shows proposed Strategic bicycle corridors in the vicinity of Parramatta, as shown at Figure 5-1, including a link to the east towards the Strathfield LGA, linking to Sydney Olympic Park.

Figure 5-1 Sydney's Cycling Future – Parramatta



Source: http://www.transport.nsw.gov.au/sites/default/files/b2b/publications/sydneys-cycling-future-web.pdf

Planning Guidelines for Walking and Cycling

The *Planning Guidelines for Walking and Cycling* was jointly developed by the Roads and Maritime and the Department of Infrastructure, Planning and Natural Resources (DIPNR). The guidelines were developed to assist planners and related professionals to consider and incorporate pedestrians' and bicycle riders' requirements in their work.

In terms of related plans, they were developed to provide a detailed focus on walking and bicycle riding for the NSW Government's *Integrating Land Use and Transport Planning Policy Package*, and to provide a plan that complements the Roads and Maritime's *NSW Bicycle Guidelines* as well as the Roads and Maritime's *How to Prepare a Pedestrian Access and Mobility Plan*.

NSW Bicycle Guidelines

The *NSW Bicycle Guidelines* is a set of guiding principles that are designed to assist road designers, engineers and planners to design and construct high-quality bicycle transport infrastructure. The guidelines are provided as a guide to practitioners on how bicycle network facilities should be developed to incorporate with the greater NSW transportation network.

How to Prepare a Bike Plan

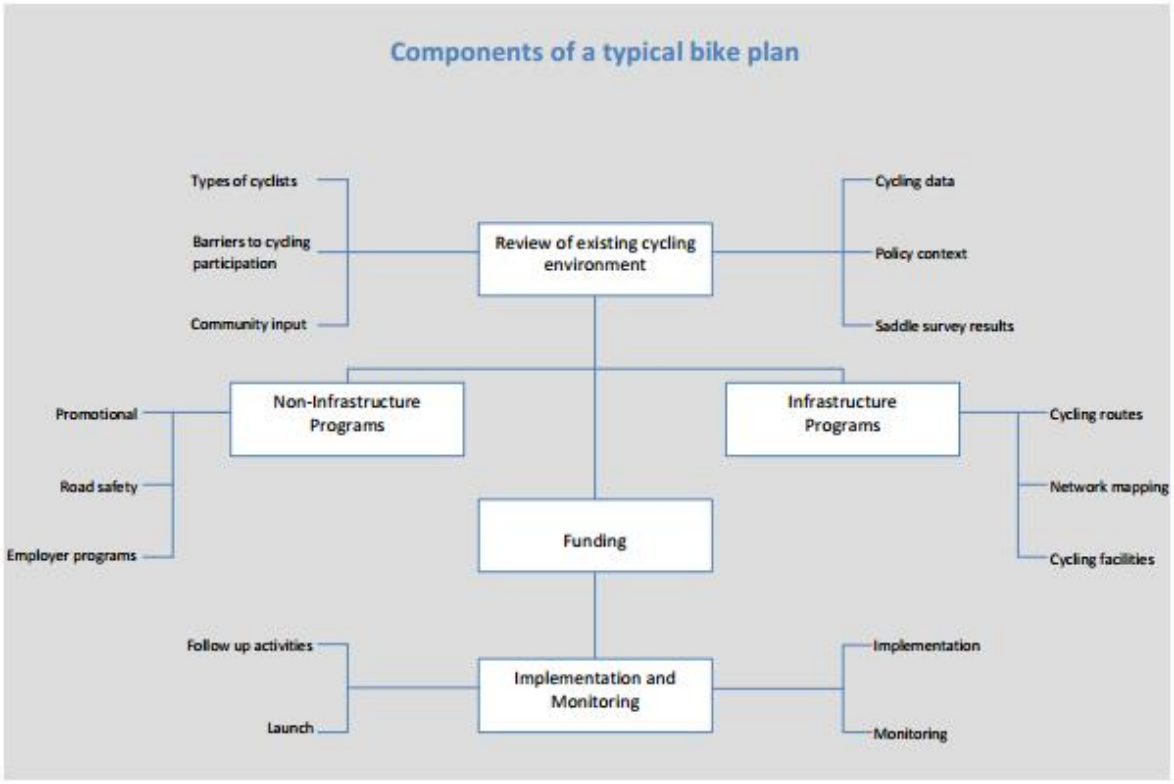
The *How to Prepare a Bike Plan* is a guide set out by Roads and Maritime for local councils to aid them in the process of developing a bike plan. One of the primary reasons to develop a bike plan is so a coordinated and strategic approach to delivering bicycle riding infrastructure and promotional programs can be taken.

It state that a properly implemented bike plan should:

- Contribute to a healthy, active and liveable community;
- Help reduce greenhouse gas emissions;
- Improve bicycle and pedestrian infrastructure;
- Reduce dependency on private motor vehicle usage;
- Reduce road congestion;
- Reduce parking congestion;
- Increase mobility and independence for those without cars;
- Increase capacity for local public transport networks; and
- Reduce health costs, travel times, noise and vehicle operating costs.

The guideline outlines the details that are used to influence the decisions that make up the bike plan. The spine of the guidelines relate to the following; reference to background studies, stakeholder engagement, the existing bicycle riding environment, proposed bicycle strategy and recommended works. The components of a typical bike plan and the way that they supplement one another can be seen in the extract below in Figure 5-2.

Figure 5-2 Components of a Typical Bike Plan



Source: NSW BikePlan

5.2 Strathfield's Future

5.2.1 Strathfield Council Planning

The following planning documents provide the planning context for the pedestrian and bicycle riding access and networks in Strathfield and are summarised in the following sections.

Strathfield 2025 Community Strategic Plan

The *Strathfield 2025 Community Strategic Plan* outlines the community's long-term vision for Strathfield's future in achieving wellbeing and prosperity. The document is based on five broader inter-related themes, as shown at Figure 5-3, including:

- Connectivity - address the issue of ongoing maintenance, upgrades and renewal of local transport infrastructure, including new cycleways.
- Community Wellbeing – making the community healthy, active and inclusive. Providing facilities, parks and open spaces to support a range of recreational and community activities such as walking and bicycle riding will enable this goal.
- Prosperity and Opportunities - ensuring development of industrial and commercial areas is sustainable and well planned. This may encompass improvement of road and cycle networks, effective transport integration and infrastructure.
- Liveable Neighbourhoods - to have Strathfield possessing high quality sustainable urban design that blends innovative development with existing local character. As the population increases, it will be essential that people who reside in the moderately dense units are well serviced by the infrastructure.

Figure 5-3 Strathfield 2025 Community Strategic Plan - Five Broad Themes

1. CONNECTIVITY

1.1 Movement to and from Strathfield is easy and safe
1.2 Infrastructure and development is integrated, planned and sustainable
1.3 Information and digital technologies connect local to global

2. COMMUNITY WELLBEING

2.1 Strathfield is a safe and healthy place
2.2 Strathfield community is healthy, active and inclusive
2.3 Strathfield is a harmonious community with a strong sense of community cohesion

3. PROSPERITY AND OPPORTUNITIES

3.1 Strathfield supports innovative business development
3.2 Development of industrial and commercial areas is sustainable and well planned
3.3 Strathfield is a highly desirable place

4. LIVEABLE NEIGHBOURHOODS

4.1 Strathfield has high quality sustainable urban design that mixes well designed and innovative development with existing local character
4.2 Strathfield's neighbourhoods are clean, attractive and well maintained
4.3 Strathfield's natural environment is protected and enhanced

5. RESPONSIBLE LEADERSHIP

5.1 The Strathfield community trusts Council and is informed, valued and heard
5.2 Council is ethically and responsibly managed
5.3 Council is efficient, sustainable and delivers value for money services

Source: Strathfield 2025 Community Strategic Plan

Strathfield Local Environmental Plan 2012

The *Strathfield Local Environmental Plan 2012* (LEP) sets out standards for how land in Strathfield may be developed and additional provisions relate to the conservation of Strathfield's heritage and the protection of environmentally sensitive areas over the next decade. The aims of the plans include:

- Promote the efficient and spatially appropriate use of land, the sustainable revitalisation of centres, the improved integration of transport and land use, and an appropriate mix of uses by regulating land use and development;
- Promote land uses that provide a wide range of employment, recreation, retail, cultural, service, educational and other facilities for the local community;
- Provide opportunities for economic growth that will enhance the local community; and
- Promote future development that integrates land use and transport planning, encourages public transport use, and reduces the traffic and environmental impacts of private vehicle use.

Strathfield at the Crossroads of Sydney

The *Strathfield at the Crossroads of Sydney* is a document that presents the strategy for Economic Land Use and Employment Study. The plan aims to improve the knowledge of the Local Government Association's economic base and investigate the economic issues. The document states that Council should improve local transport infrastructure such as pedestrian connections and cycle paths. Linkages to Sydney Olympic Park, centres of Rhodes and Burwood are forecasted to become increasingly important.

Strathfield at the Crossroads of Sydney identifies that there should be further investigation to enhance walking and bicycle riding connections to employment areas.

Strathfield Residential Land Use Strategy

The Strathfield Residential Land Use Strategy advises Council how forecast residential growth in the Strathfield LGA should be implemented over the next 25 years. An important criteria identified, in respect to the accessibility and connectivity, is to have good walking and bicycle riding connections.

The report identifies that the key locations that proposed for residential growth are currently deficient in public infrastructure and community facilities. To address this, the report identifies facilities that could be funded through development contributions include improvements to the pedestrian and bicycle network, including at Courallie Avenue to Homebush West, Homebush North to the Bakehouse Quarter (Canada Bay Local Government Area), and the High Street Library to Liverpool Road.

Strathfield Comprehensive LEP Parramatta Road Corridor Urban Design

The *Strathfield Comprehensive LEP Parramatta Road Corridor Urban Design* was a study which involved the spatial analysis of the Parramatta Road corridor and its relationship with land uses, public transport, traffic and pedestrian movements. The study identified the following opportunities:

- Develop good quality cycleways from study area to Olympic Park;
- Develop good quality cycleways to key schools within the wider area;
- Develop good quality cycleways to Strathfield Town Centre;
- Develop good quality cycleways to Burwood and Rhodes;
- Upgrade existing footpaths; and
- Develop key linkages designed to encourage walking within the area.

Parramatta Road Corridor – Transport and Mobility Study

The *Parramatta Road Corridor Transport and Mobility Study* outlines key issues associated with the forecast increase in residential development along Parramatta Road corridor in terms of how this would affect transport and mobility throughout Strathfield. Some of the issues identified in this report include:

- The railway bridge crossing on Bridge Road, Homebush is a narrow carriageway shared by both bicycle riders and vehicles;
- There is currently no bike crossing on Parramatta Road;
- There is lack of direct connections to Strathfield Town Centre and Strathfield Station; and
- No bicycle parking provided on the north side of Homebush Station.

There are also several issues, which arose concerning pedestrian safety, access and mobility:

- The pedestrian route through Sydney Markets, including the hazardous crossing of Marlborough Road;
- Parramatta Road forms a barrier for pedestrians with limited pedestrian crossings;
- Limited pedestrian connections to Strathfield Town Centre and access to the “Bakehouse Quarter”; and
- No ramp or lift access is provided to Homebush Station. Flemington Station is currently being upgraded to provide a DDA compliant access to the station platform from The Crescent and the Sydney Markets.

The study considers three scenarios to assess different residential and business growth rates on transport throughout the Parramatta Road corridor:

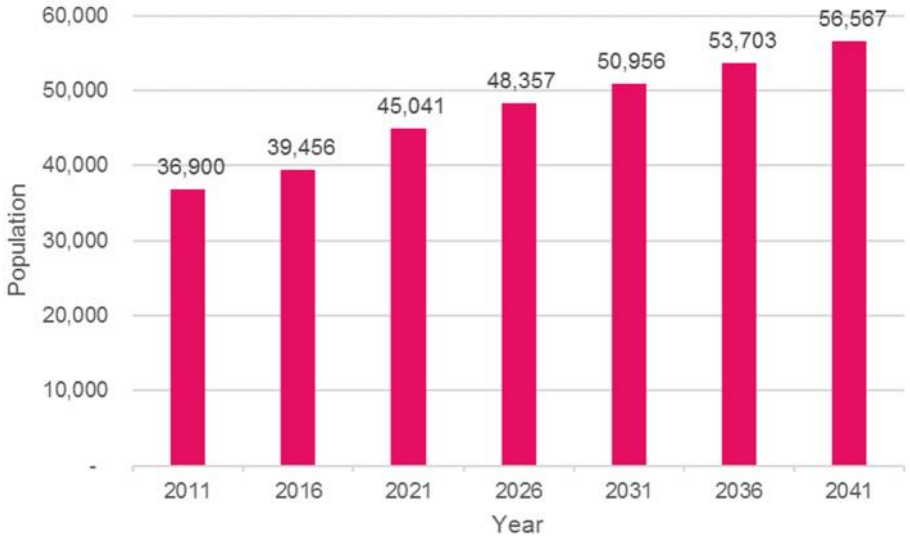
- Development scenario 1 is the base case, with the number of dwellings in the study area maintained at its current level. The following recommendations are proposed:
  - Shared path along the western side of Bridge Road and provide a bicycle crossing across Parramatta Road; and
  - Improve the lighting of the footpath beside the railway line and investigate improvements to the footpath for the pedestrian access to Flemington Station from the Courallie Avenue Precinct.
- Development scenario 2 includes development for the LEP potential, in which case the total number of dwellings in the study area would be more than triple the amount in the base case. The following recommendations are proposed:
  - Shared path from Allen Street Reserve to the Strathfield Bicycle Route;
  - Signalised Pedestrian crossing of Parramatta Road;
  - Grade-Separated crossing of Parramatta Road; and
  - Widening Subway Lane underpass Footpath to enable wheelchair access.
- Development scenario 3 assumes development of the full LEP potential, plus an added 25% increase in additional dwellings. The number of dwellings would be more than four times that of the base case. The following recommendations are proposed:
  - Developments to provide additional width of Parramatta Road to allow for footpath widening, on-street parking, bus priority lanes or light rail.

5.2.2 Future Population and Employment

Forecast Population

Approximately 40,000 people currently live within the Strathfield LGA. This is forecast to grow to around 57,000 people by 2041, as shown in . This is an increase of around 38 percent from the current population.

Figure 5-4 Forecast population in Strathfield LGA

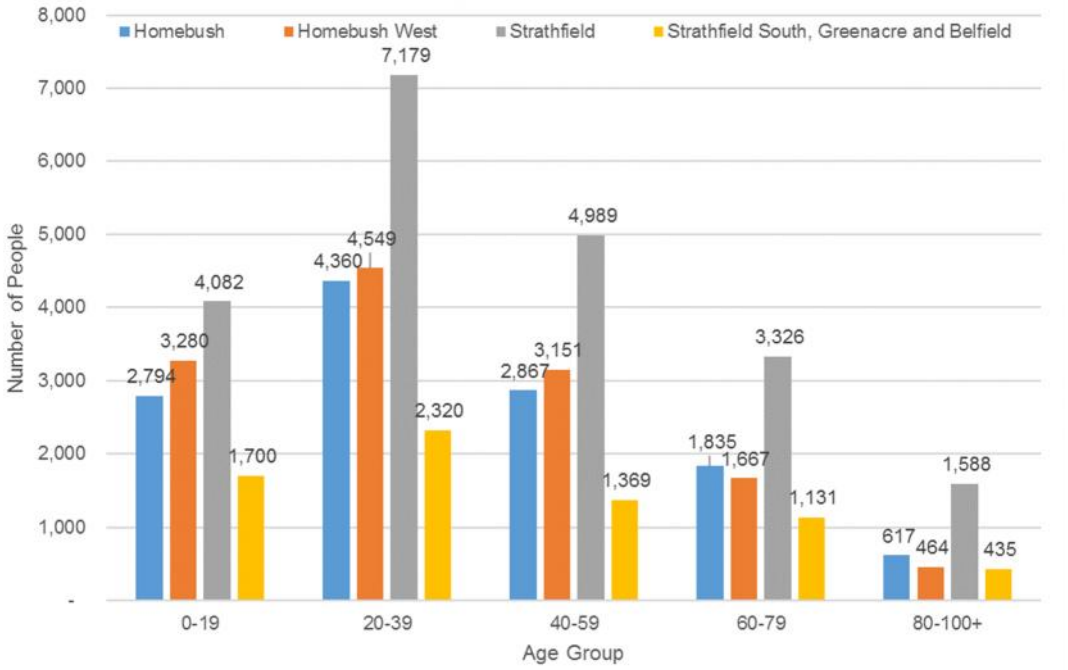


Source:
http://visual.bts.nsw.gov.au/tz/#973,972,978,977,981,984,983,2500,982,979,974,966,965,964,961,958,963,971,960,959,962,976,2349

Forecast Age Profile

The forecast age profile for by suburb in the Strathfield LGA in 2036 is shown in Figure 5-5. This shows that the 20 – 39 year age group has the highest number people for each suburb location in the LGA. This indicates that there is good potential for increasing travel mode share by walking and bicycle, with a younger age demographic expected in the future, particularly in the Strathfield suburb.

Figure 5-5 Forecast Age Profile by Suburb - 2036

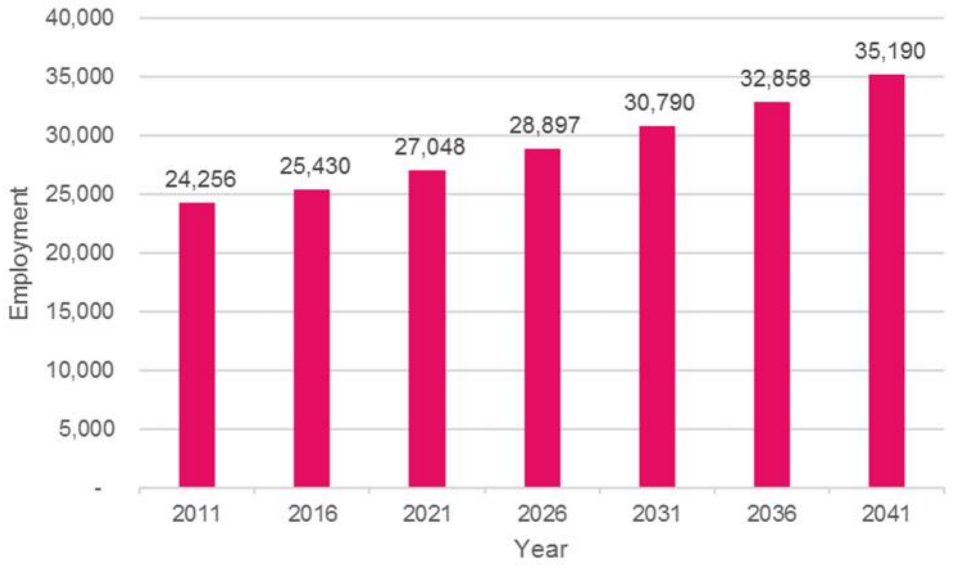


Source: NSW Bureau of Transport Statistics population forecasts

Forecast Employment and Workforce

The NSW Department of Planning and Environment has forecast that the number of people employed within the Strathfield LGA will grow from around 25,400 employees in 2016 to 35,190 employees in 2041. This is shown at Figure 5-6.

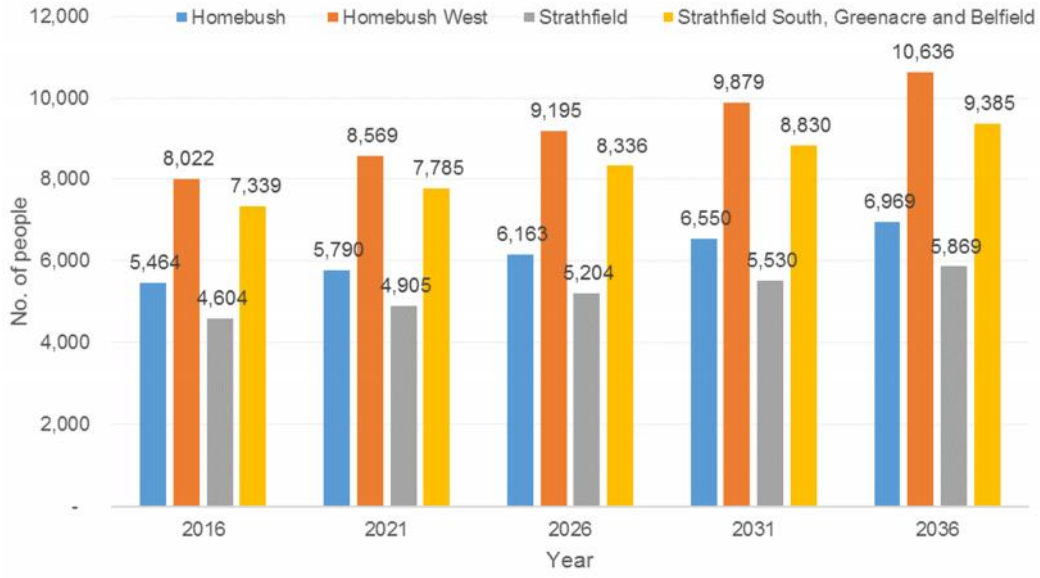
Figure 5-6 Forecast Employment in Strathfield LGA



Source: NSW Bureau of Transport Statistics employment forecasts

Walking and bicycle riding connections should be provided to locations of employment to support active travel as a mode of access to employment areas. The forecast number of people to be employed in each suburb in Strathfield is shown in Figure 5-7. This shows that the highest number of jobs would be provided in the Homebush West and the southernmost suburbs in the Strathfield LGA.

Figure 5-7 Forecast Employment in Strathfield LGA - by Suburb

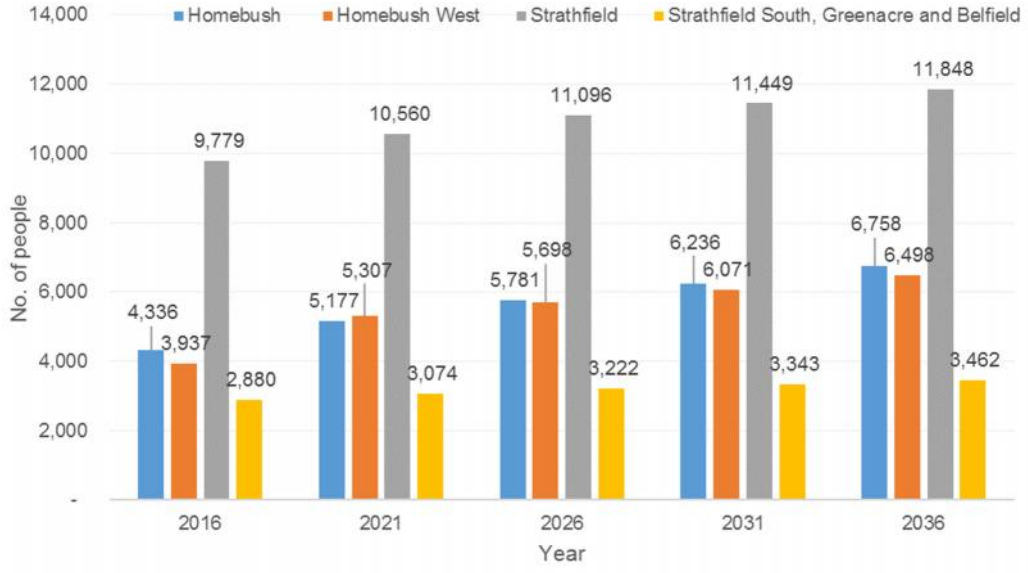


Source: NSW Bureau of Transport Statistics employment forecasts

Similarly, walking and bicycle riding links should be provided to areas where the workforce lives to encourage access to jobs by walking and bicycle riding, including linking trips with public transport. The forecast number or people in the workface by suburb in the Strathfield LGA is shown in Figure 5-8. This indicates that the Strathfield suburb would have the highest workforce population, with around 11,850 people in 2036.

Figure 5-8 Forecast Workforce in Strathfield LGA - by Suburb

Source: Australian Bureau of Statistics, Census of Population and Housing 2011



Source: NSW Bureau of Transport Statistics workforce forecasts

5.3 Planning for walking and bicycle riding in surrounding areas

In developing the walking and bicycle networks for Strathfield, it is important to consider walking and bicycle planning and connections to the neighbouring LGAs. This is considered in the following sections.

5.3.1 City of Greater Cumberland

Former Auburn LGA

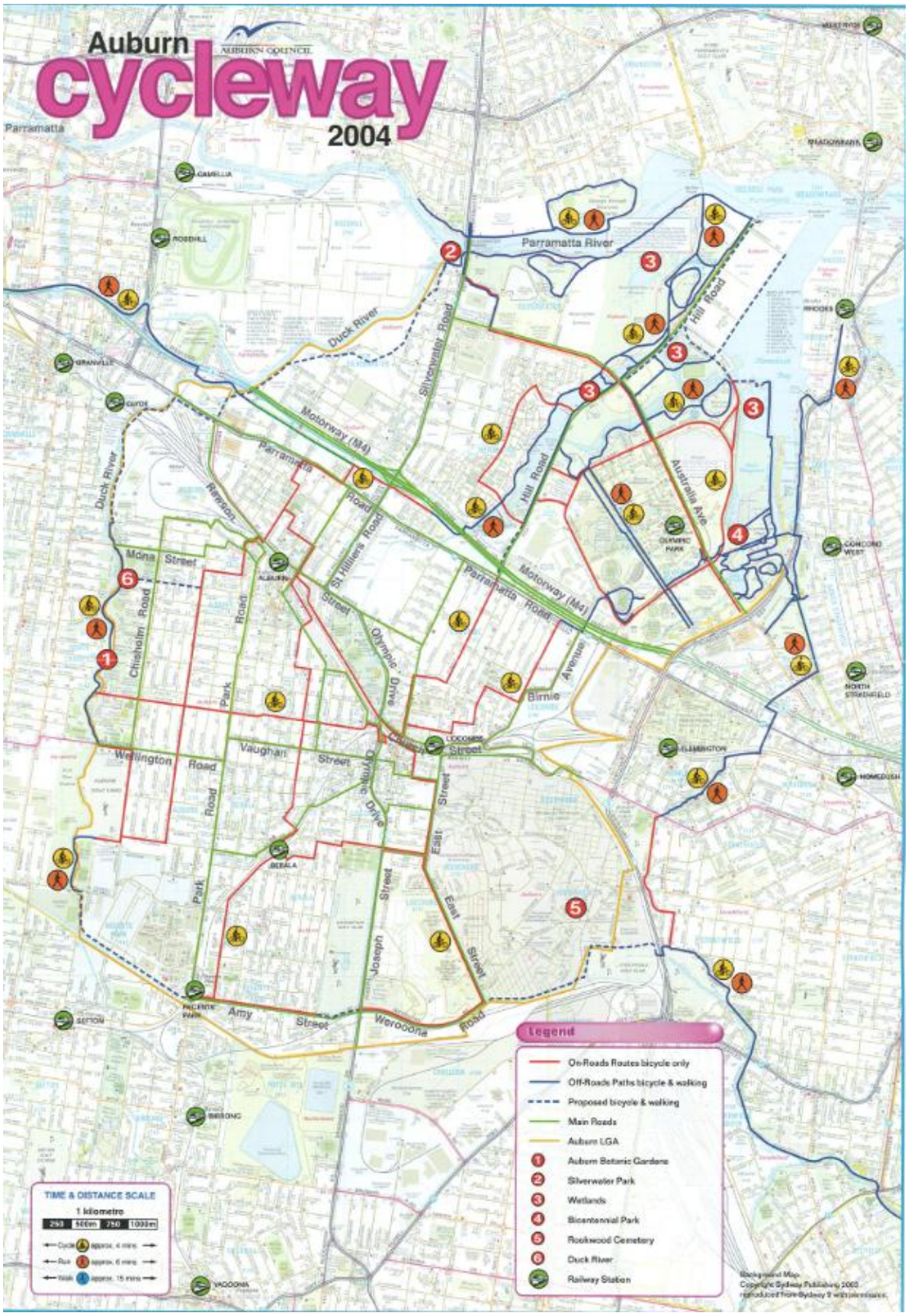
Auburn LGA was located on the north west side of Strathfield, bordering with Homebush Drive, Parramatta Road, Olympic Park Railway, Centenary Drive and Weeroona Road. It is now part of the City of Greater Cumberland.

A summary of the existing and future bike network links to Strathfield LGA are summarised in Table 5-1. The proposed walking and bicycle links developed as part of *AT-Strathfield* should consider links to City of Greater Cumberland LGA at Powells Creek Reserve, Weeroona Road, Wilson Street, with a bicycle link provided at Australia Avenue.

Table 5-1 Auburn LGA Bicycle Route Facilities

Street Link	Current Cycleway Type	Status / treatment	Bicycle Route Facilities
Powells Creek Reserve	Continuous off-road shared path	Existing	Off- road
Weeroona Road	Proposed bicycle and walking path	Proposed	Off Road / On-Road
Wilson Street	Shared bicycle/pedestrian pathway	Existing	Off Road
Australia Avenue	Sealed Shoulder	Existing	On-road

Figure 5-9 Auburn Cycleway 2004



Source: Auburn Council, Alive and Active in Auburn (2003)

5.3.2 Canterbury Bankstown LGA

Former Bankstown LGA

The former Bankstown LGA is located to the southwest of the Strathfield LGA. As shown in Figure 5-10, the Bankstown Bike Plan indicates that there are no direct bicycle links between Bankstown and Strathfield. The major road routes linking Strathfield and Bankstown that may have potential for bike routes include:

- Hume Highway;
- Roberts Road;
- Juno Parade; and
- Punchbowl Road.

Figure 5-10 Bankstown Bicycle Route Map

Source: Bicycle riding around the Bankstown Local Government Area (2014)

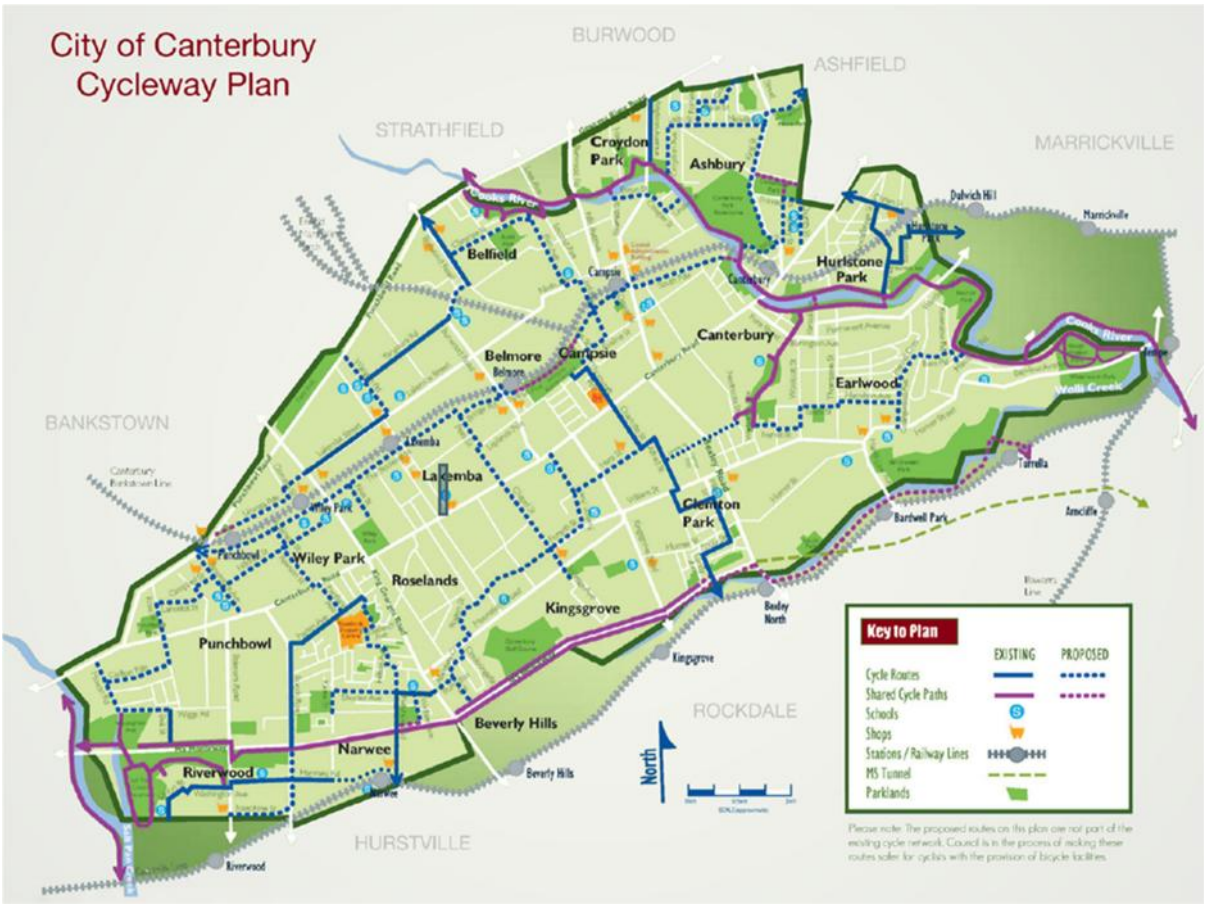
Former Canterbury Council Bike Plan

The former Canterbury LGA is located to the southeast of the Strathfield LGA, bordering the LGA along Punchbowl Road, Cooks River and the M5 Motorway. There are two bicycle routes which connect to the Strathfield LGA, including via Burwood Road and the Cooks River. These routes are summarised in Table 5-2, with an extract of the Bike Plan shown at Figure 5-11.

Table 5-2 Canterbury LGA Bicycle Route Facilities

Street Link	Speed Limit (km/h)	Current Cycleway Type	Status / treatment	Bicycle Route Facilities
Cooks River	N/A	Off Road shared path	Existing	Off-road
Burwood Road	50	on road shoulder lane	Existing	On-road

Figure 5-11 City of Canterbury Cycleway Plan



Source: City of Canterbury Cycleway Plan (2008)

5.3.3 Canada Bay

The City of Canada Bay LGA is located to the north east of Strathfield. An extract of the Canada Bay Bike Strategic Bike Plan is shown at Figure 5-12, with a summary of the existing and proposed bicycle links to the Strathfield LGA provided in Table 5-3.

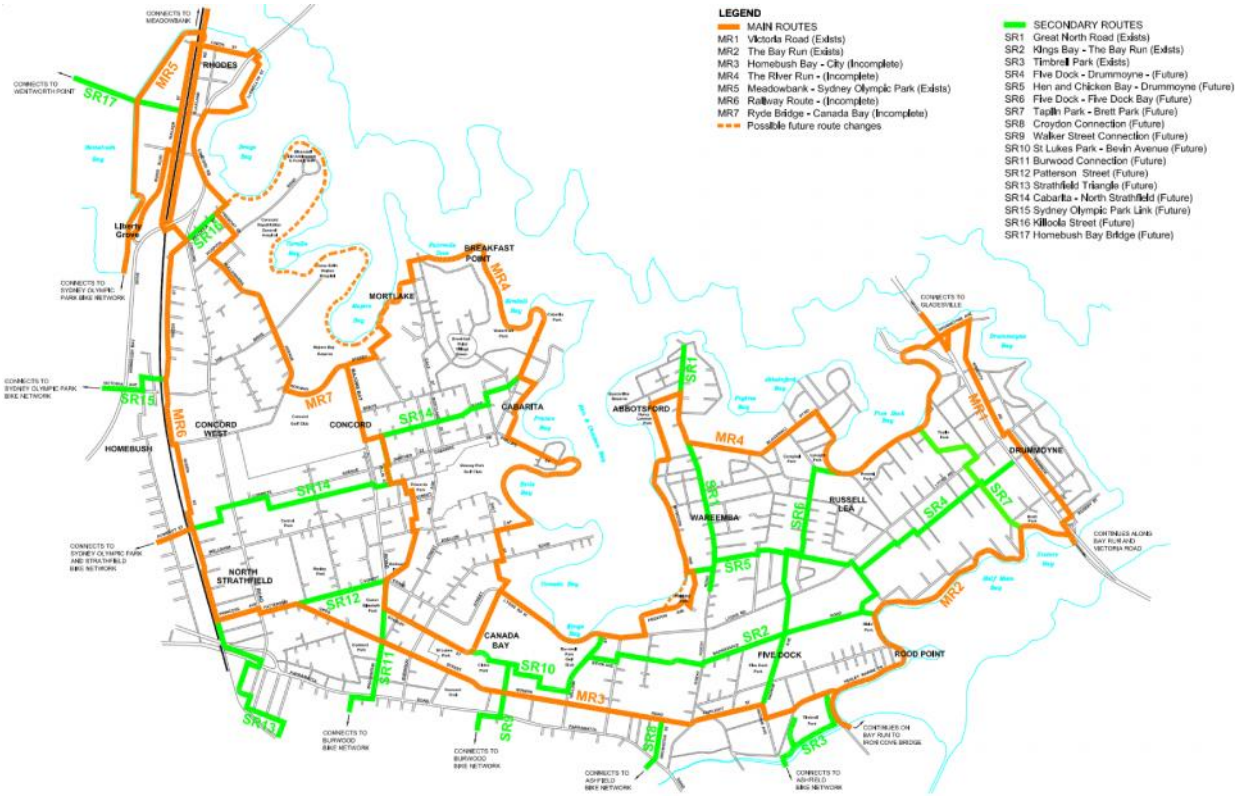
Main Route 6 identified in the Plan comprises of a connection along Harrison Avenue, Killoola Street and Queen Street to Pomeroy Street using on road bicycle logos and a shared footpath near the Harrison Avenue/Killoola Street intersection.

An on-road bicycle link towards Strathfield is proposed via Moseley Street, Cooper Street, with a shared path proposed along Leicester Avenue, crossing Leicester Avenue at new traffic signals into Cooper Street (west). This route would continue to Parramatta Road.

Table 5-3 City of Canada Bay Bicycle Route Facilities

Street Link	Current Cycleway Type	Status / treatment	Bicycle Route Facilities
Powells Creek Reserve	Continuous off-road shared path	Existing	Off - road
Pomeroy Street	None	Proposed	“Main route” – on-road
Cooper Street	None	Proposed	“Secondary route” – on-road

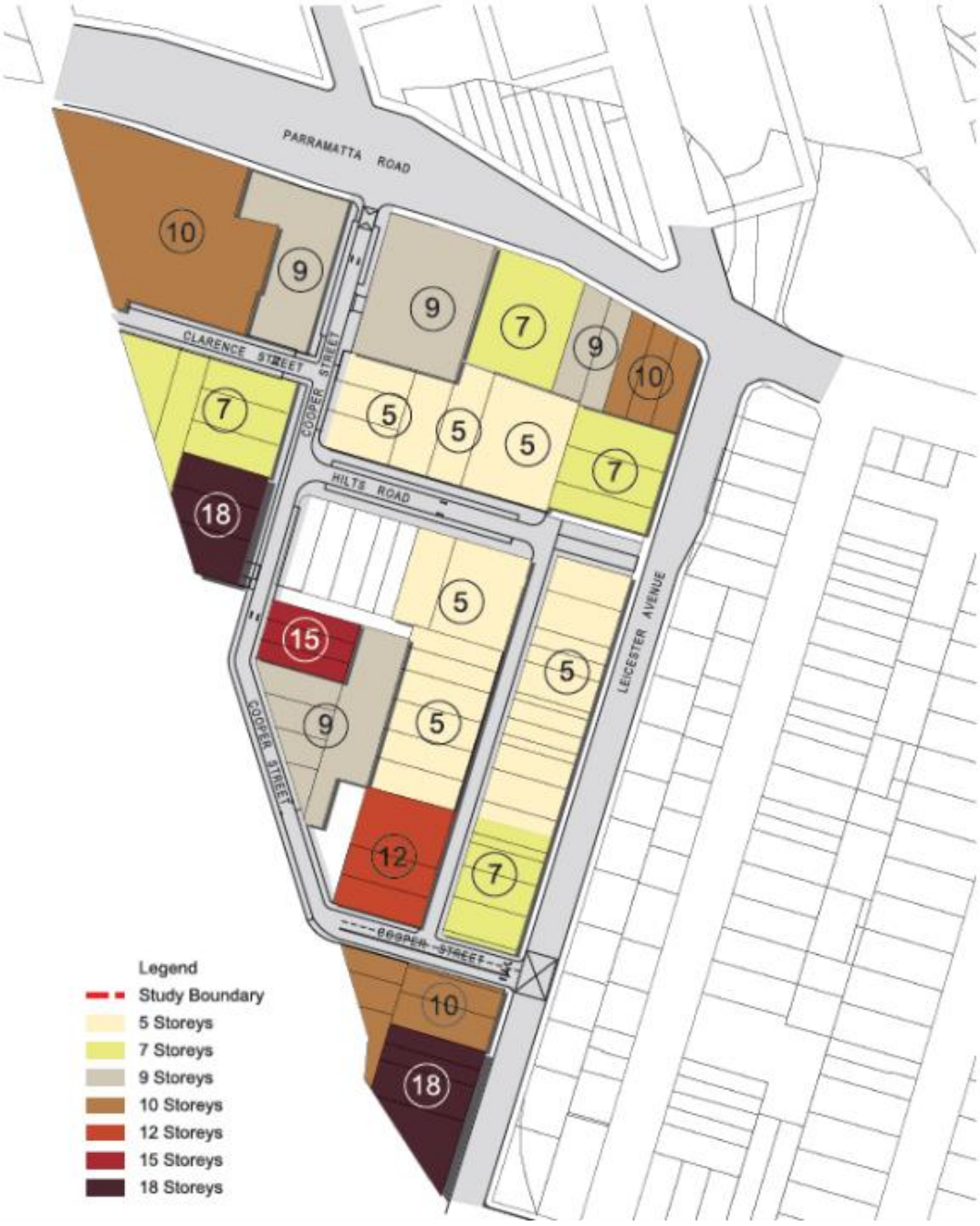
Figure 5-12 City of Canada Bay Strategic Bike Plan



Source: City of Canada Bay’s Strategic Bike Plan Review (2016)

During consultation with City of Canada Bay Council, Council also advised that the road alignment for Copper Street is proposed to be realigned as identified in the Strathfield Triangle DCP. This new link was identified as a possible route for bicycle riders, with footpaths also to be provided. This proposed arrangement for Copper Street is shown at Figure 5-13.

Figure 5-13 Strathfield Triangle DCP



Source: Strathfield Triangle Development Control Plan (Clouston Associates, December 2012)

5.3.4 Burwood

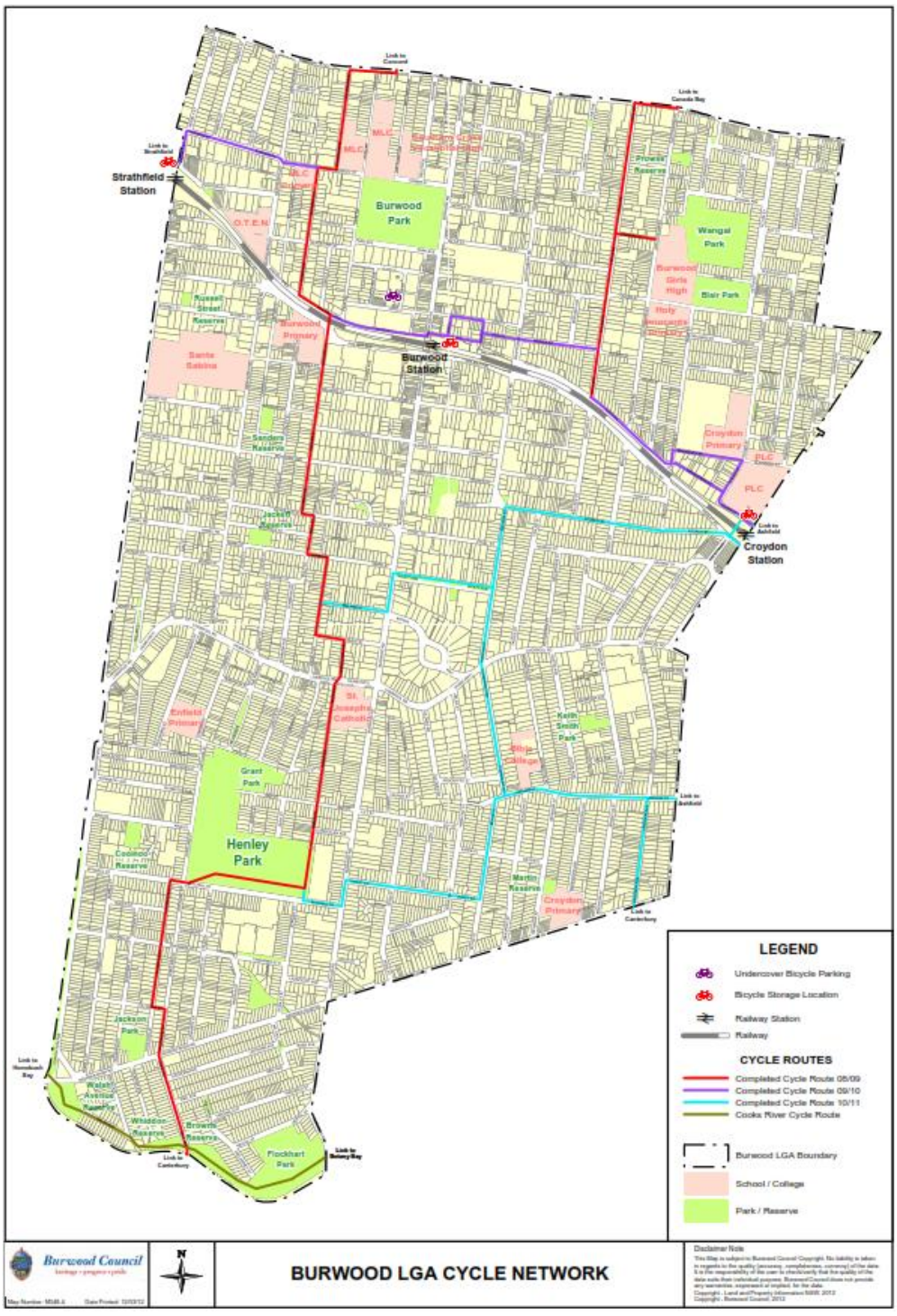
The Burwood LGA is located to the east of the Strathfield LGA, with a border at Coronation Parade, The Boulevarde and Mosley Street.

An extract of the Burwood Bike Plan, showing existing and proposed bicycle routes is shown in Figure 5-14, with a summary of the bicycle connections to the Strathfield LGA shown in Table 5-4. Based on this information, the development of the bicycle network for AT-Strathfield should consider bicycle links to Mosley Street and Coopet Street.

Table 5-4 Burwood LGA Bicycle Route Facilities

Bearing	Street Link	Speed Limit (km/h)	Current Cycleway Type	Status / treatment	Bicycle Route Facilities
East of Strathfield	Mosley Street	50	On-road shoulder lane	Existing	On-road
	Cooper Street	50	On-road shoulder lane	Existing	On-road

Figure 5-14 Burwood Bike Plan



Source: Burwood LGA Cycle Network (2012)

5.3.5 Summary

There are a number of proposed and existing bicycle routes identified in Bike Plans for the neighbouring LGAs surrounding Strathfield. These routes have been considered as part of *AT-Strathfield* to ensure continuity of bicycle routes between Strathfield and surrounding areas.

Proposed bicycle links between Strathfield and surrounding local government areas were discussed with representatives from each of the surrounding Councils during a Stakeholder workshop, as discussed in Section 8.2.1.

6. Planning for Pedestrians

Walking is the simplest form of transportation. It is available to most people, including those who use mobility aids, is free and has insignificant environmental cost. Furthermore, all trips involve some walking component, if only from the car park to the shop. Therefore, planning for safe and convenient pedestrian access is very important in transportation planning.

This section a provides some introductory guidance on planning for walking.

6.1 Creating a Safe and Attractive Environment for Walking

Pedestrians use every part of the public domain, including roads, footpaths, nature strips, shopping centres and other public spaces. Some planners and engineers incorrectly assume that planning for pedestrians will follow the same logic as traffic planning:

- Car → 'trips' → 'routes' → 'traffic network'

The planning scale for pedestrians is detailed to accommodate the local nature of the trips. Pedestrian movement can be better conceptualised in terms of:

- Pedestrian → 'activity' → 'areas of activity' → 'pedestrian environment'

Rather than conforming to traditional traffic engineering concepts like turning radii and design speeds, pedestrians are far more attuned to the environment in which they are moving. Therefore, planners need to consider the needs of pedestrians with regards to design, amenity, and personal security. Pedestrians are particularly vulnerable to cars and other motorised traffic.

Pedestrian Needs

The provision of pedestrian infrastructure should not only aim to fulfil the requirements of existing users or to comply with relevant standards, but should also promote walking for transport, recreation and health and increase the number of trips taken by foot. Such an outcome would result in fewer car trips, healthier residents and a more active (and safe) public domain. A number of elements are required in order to provide a high quality pedestrian environment:

Safety

Perceived and actual safety is very important to pedestrians. Road crossings present the greatest danger to pedestrians. Therefore, safe crossing locations must be provided at regular intervals along major streets or at the location where key desire lines cross major streets. Pedestrians will rarely walk along an indirect route to access safe crossing points, so frequent, direct crossing points must be provided.

Lighting and open space is important for security. Pedestrians of all ages and genders need to feel that it is safe to walk whenever they choose to do so.

Directness

As noted above, pedestrians do not like to walk out of their way to reach a destination. This is a natural response to avoid the extra effort involved in walking extra distance. Pedestrian facilities serving desire lines between major centres of activity need to be direct and legible in order to provide for and encourage walking trips.

Wherever possible, barriers should be overcome with additional crossing points such as grade separated or signalised crossings, although grade separation does not always provide the most direct access.

Engineering solutions to direct pedestrians for safety reasons (such as fencing) should only be used when no other solution is possible.

Amenity

Pedestrians are particularly sensitive to the quality of the urban environment. Areas with high volumes of traffic, excessive noise, and poor pavements will discourage walking. Additionally, urban areas should be maintained at a human scale that provides an attractive walking environment.

While it would be extremely costly to improve the amenity of all pedestrian areas, targeted works can achieve a great improvement in areas of high pedestrian activity (such as shopping streets, areas around commercial, employment and public buildings, and recreation areas). Spot improvement programs can also target localised areas of high need.

Suitable for all users

Quality pedestrian environments must be available to all who choose to use them. This requires compliance with Austroads Guide to Traffic Management and Guide to Road Design and AS1428.1-2001 - Design for access and mobility. Paths must be of a suitable width to accommodate the number of pedestrians (and other users, such as mobility scooters) expected and be of an appropriate gradient, including ramps. The path should be continuous and free of obstructions such as signage and street furniture. The needs of hearing and vision-impaired users must be considered and provided for, especially where user safety is an issue.

Pedestrian Strategies

Council should support and encourage walking in the Strathfield LGA through the following actions:

- Provide an environment where the personal, social and environmental benefits of walking are recognised as paramount and that the needs of pedestrians are considered as a primary element in any projects affecting the urban landscape;
- Ensure that all planning and redevelopment includes walking as a safe, healthy and accessible form of transport; and
- Incorporate the needs of people with a disability into all levels of planning and implementation of the transportation network and public domain improvements.

6.2 Best Practice Standards

This sub-section provides a brief overview of best practice standards that apply to the treatment of pedestrian facilities.

Minimum Footpath Widths

The *Austroads Guide to Road Design Part 6A 2009 – Pedestrians and Cyclist Paths* states that:

"As a guide, the desirable minimum width of a footpath that has a very low demand is 1.2 m with an absolute minimum of 1.0 m. These widths should be increased at locations where:

- *high pedestrian volumes are anticipated*
- *a footpath is adjacent to a traffic or parking lane*
- *a footpath is combined with bicycle facilities*
- *the footpath is to cater for people with disabilities".*

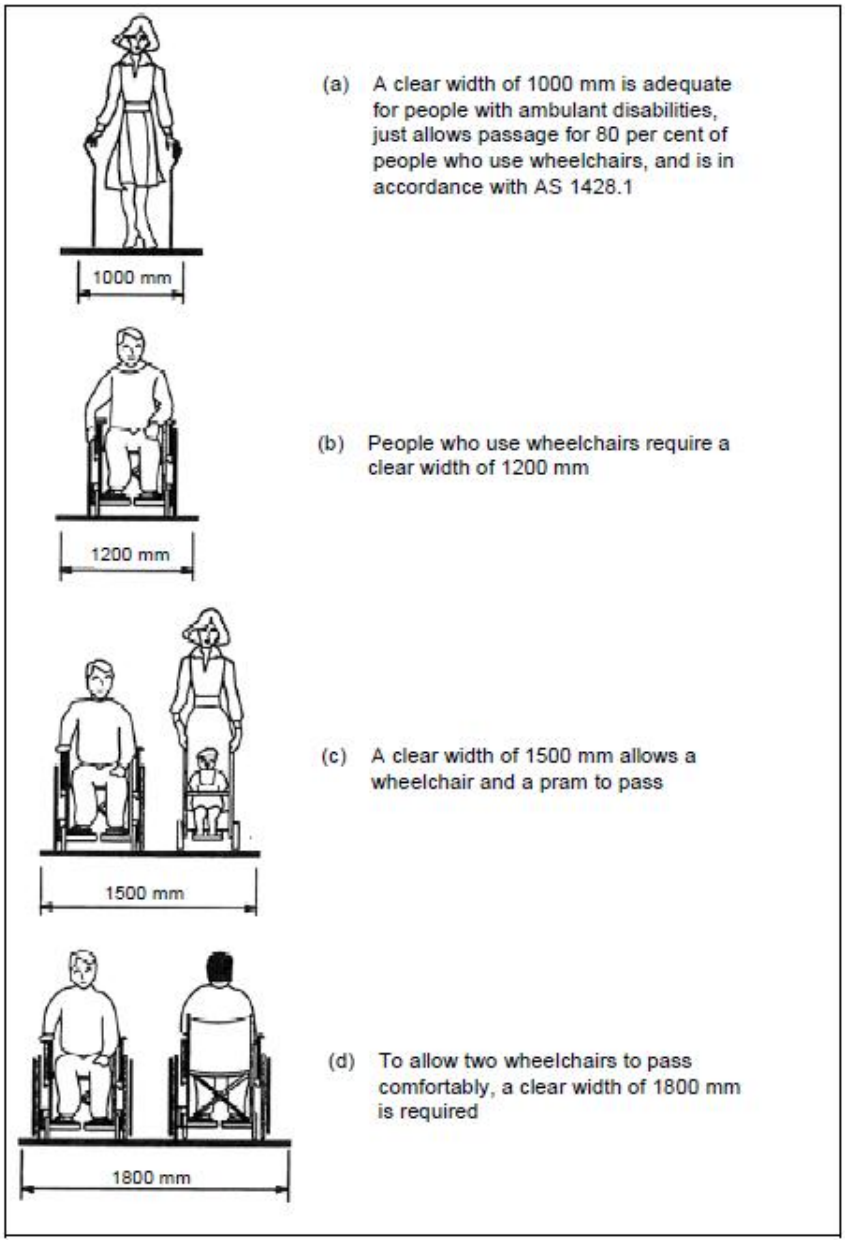
Figure 6-1 and Table 6-1 show the minimum widths for various types of footpath users.

Table 6-1 Minimum Footpath Widths

Situation	Desired width (m)	Comments
General low demand	1.2 to 1.0 (absolute minimum)	General minimum is 1.2 m for most roads and streets. Clear width required for one wheelchair. Not adequate for commercial or shopping environments.
High pedestrian volumes	2.4 m (or higher based on demand)	Generally commercial and shopping areas.
For wheelchairs to pass	1.8 to 1.5 (desired minimum)	Allow for two wheelchairs to pass (1.8 m comfortable, 1.5 m minimum) Narrower width (1.2 m) can be tolerated for short distances.
For people with other disabilities	1.8 to 1.0	

Source: *Austroads Guide to Road Design Part 6A 2009 – Pedestrians and Cyclist Paths*

Figure 6-1 Path Width Requirements for Various Users



Austroads Guide to Road Design Part 6A 2009 – Pedestrians and Cyclist Paths Minimum Grades

Grades of footpaths and drop kerbs are important as they affect the usability and safety of pedestrian facilities. Long sections of high grade footpath can be extremely difficult for mobility impaired users to negotiate.

High grade kerb ramps can also cause safety issues for mobility impaired users. Users can become vulnerable to general traffic as they attempt leave the carriageway and proceed up steep ramps.

It is noted that AS 1428.1 – 1993, specifies that any footpath should not exceed a gradient of 1:8 as wheelchairs may tip backwards. This is considered as an absolute maximum ramp gradient and should only be used in extenuating circumstances.

Table 6-2 shows the maximum grades for footpaths and kerb ramp treatments.

Table 6-2 Maximum Grades

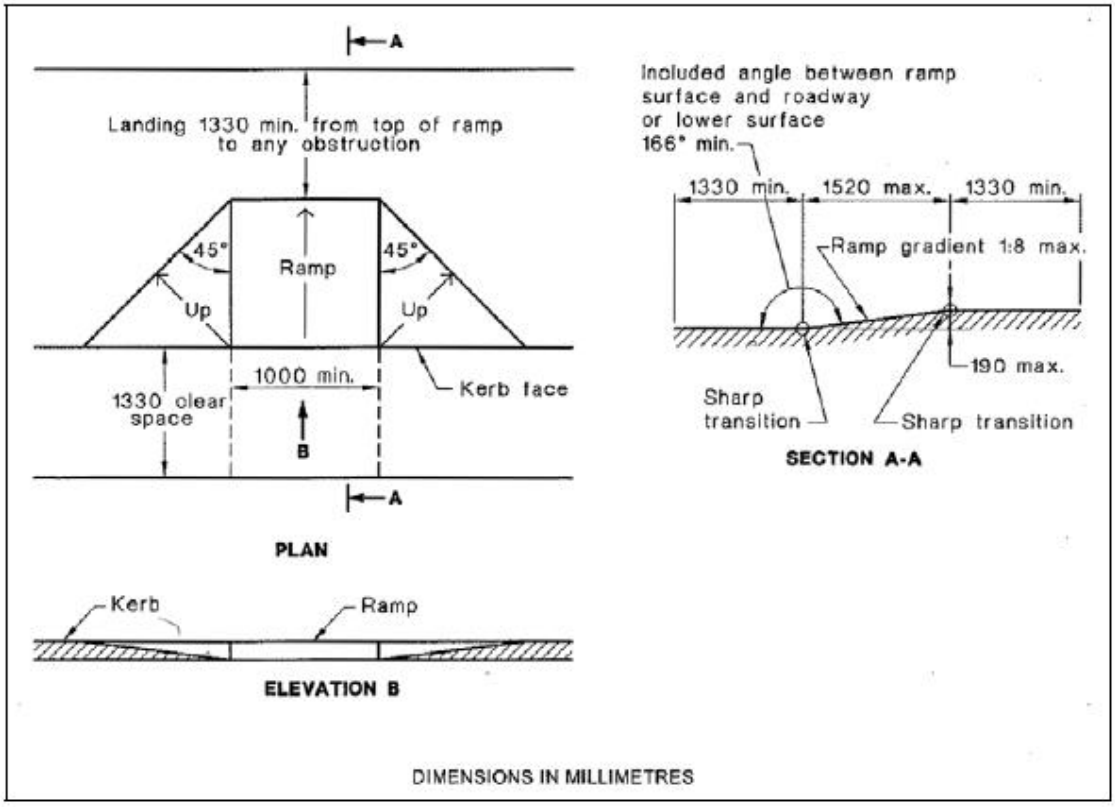
Footpaths	Grade
Recommended maximum grade (footpaths)	1:10 (2.5% cross fall)
Absolute maximum grade (kerb ramps)	1:8

Austroads Guide to Road Design Part 6A 2009 – Pedestrians and Cyclist Paths Kerb ramps

The difference in the level between the footpath and the roadway is a common situation that poses difficulties for pedestrians, particularly with mobility and vision impairments. A drop kerb or kerb ramp provides a smooth change in the level between the footpath and the roadway (maximum grade of 1:8).

The general dimensions of a drop kerb are illustrated in Figure 6-2. The *Austroads Guide to Road Design Part 4 – Intersections and Crossings* states that: “A minimum footway width of 1330 mm should be provided beyond the top of the ramp, to ensure that users of the footway along the street are not inconvenienced by the ramp.”

Figure 6-2 Kerb Ramp Design



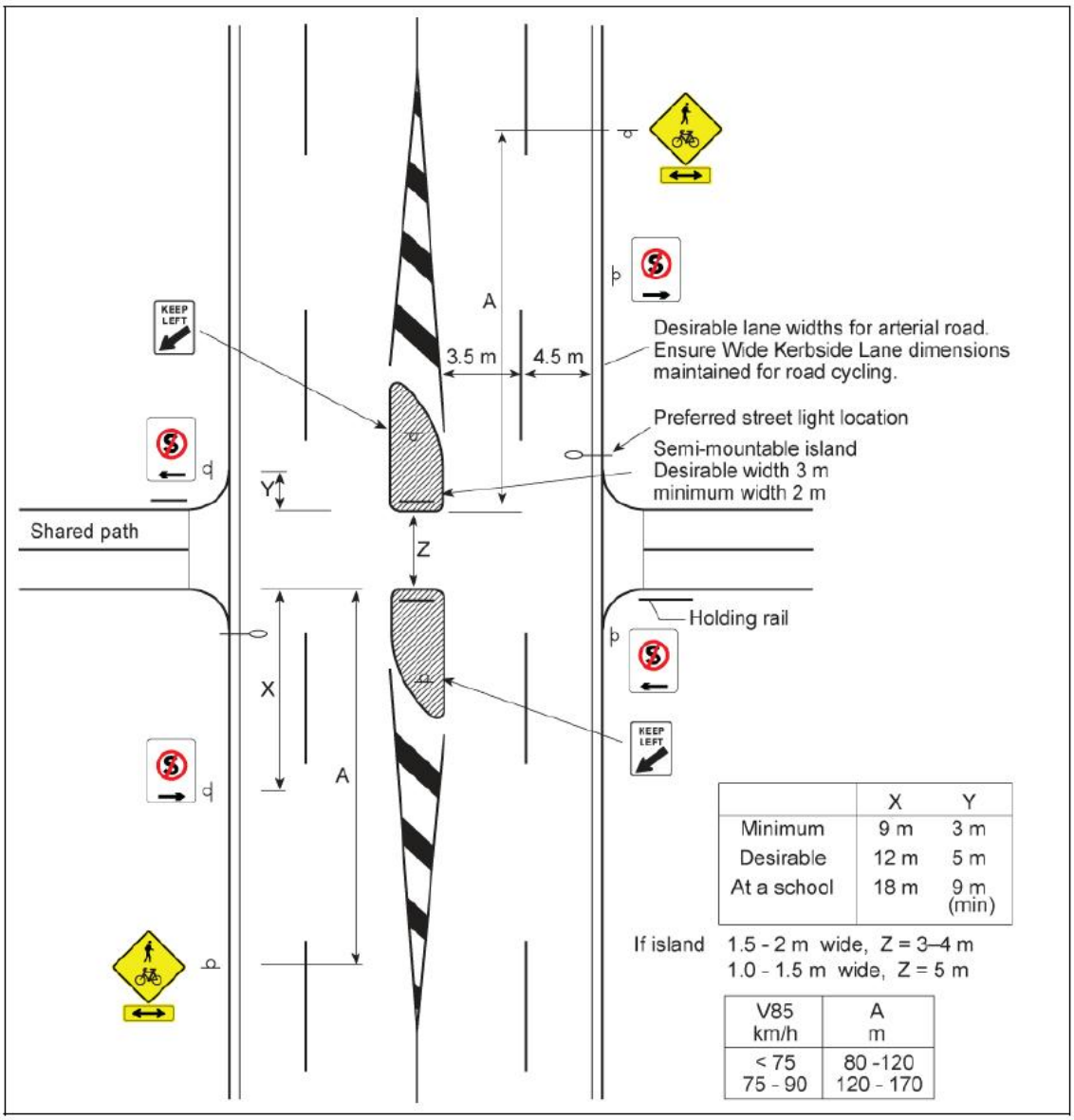
Source: *Austroads Guide to Road Design Part 4 – Intersections and Crossings.*

Pedestrian Refuges

Pedestrian refuges allow a safe point for pedestrian store safe across wide or busy roads. It is noted that many people to not feel safe when using refuges and should the funds be available kerb extensions should be considered to reduce the width of the road at the crossing points rather than using refuges.

The general dimensions of a kerb ramps are illustrated in Figure 6-3. Pedestrian refuges should in all cases be adequately illuminated in accordance with AS/NZS 1158 – 2007 and careful positioning of street lights should be considered in accordance with AS 1158.4: 2007. *Austroads Guide to Road Design Part 4 – Intersections and Crossings* also recommends a refuge width of at least 2 m to allow storage for a person with a pram or bicycle needs.

Figure 6-3 Pedestrian Refuge Design



	X	Y
Minimum	9 m	3 m
Desirable	12 m	5 m
At a school	18 m	9 m (min)

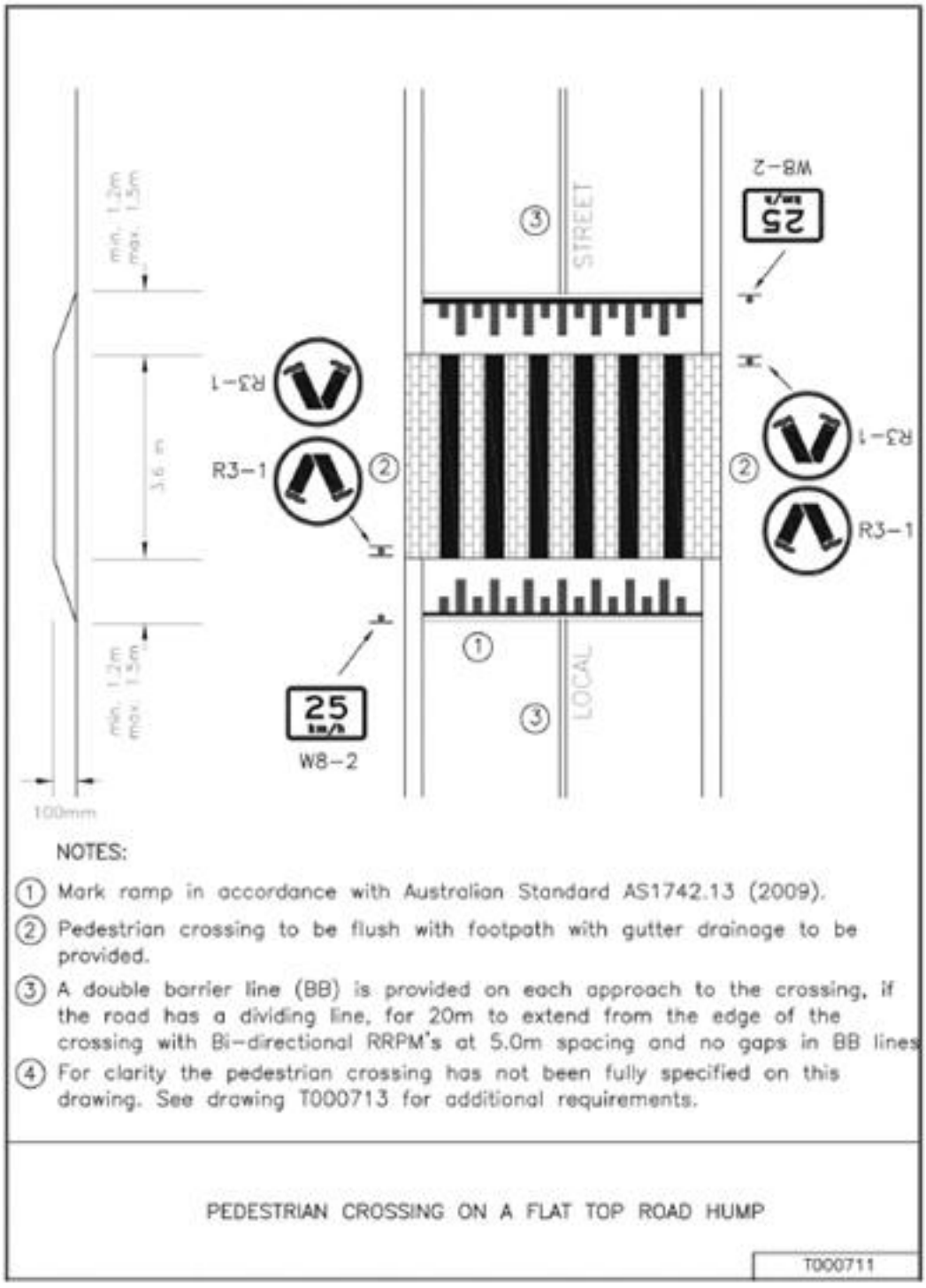
V85 km/h	A m
< 75	80 -120
75 - 90	120 - 170

Source: *Austroads Guide to Road Design Part 4 – Intersections and Crossings.*

Wombat Crossings

Wombat crossings are generally the same dimensions as flat top road humps (with pedestrian priority provided with the use of 'zebra' style line markings) as shown in Figure 6-4. It provides priority to pedestrians as well as acting as a traffic calming measure. The minimum length of the device including ramps is 6 metres and the desirable minimum height of the platform is 100 mm. Wombat crossings generally have ramp gradients of 1:15 to 1:20 to be bicycle and/or bus friendly. Wombat crossings can be used when the warrant for such a traffic control is met as required in AS 1742.10

Figure 6-4 Typical details of a wombat crossing



Source: RMS Australian Standards Supplement AS1742 Manual of Uniform Traffic Control Devices Parts 1-16 (RMS, July, 2013)

Tactile Ground Surface Indicators (TGSI's)

TGSI's should also be provided at all pedestrian crossing locations to indicate the edge of the roadway to sight impaired pedestrians.

Roads and Maritime Services Requirements for Pedestrian (Zebra) Crossings

The *RMS Australian Standard Supplements 2013, section 6.3*, provides practice for numerical warrants for a pedestrian (zebra) crossing. It is warranted where in each of three separate one hour periods in a typical day where:

- The pedestrian flow per hour (P) crossing the road is greater than or equal to 30 and;
- The vehicular flow per hour (V) through the site is greater than or equal to 500 and;
- The product PV is greater than or equal to 60,000.

Special Warrants may also be considered where consideration can be given to a potential pedestrian crossing site. In such circumstances, council should justify why this location is in need of special consideration. The special warrant conditions state that:

- PV ≥ 45,000;
- P ≥ 30; and
- V ≥ 500.

6.3 Methodology for Identifying Pedestrian Needs

6.3.1 Identification of Activity Generators and Primary Routes

The following approach was adopted in developing a hierarchy of pedestrian needs:

Primary Pedestrian Activity Zone

This is typically the main commercial street i.e. Strathfield Square and The Boulevarde in Strathfield and The Crescent in Homebush in this case. Throughout the day, pedestrians are attracted to this zone from surrounding residential areas: Therefore, it is an important trip attractor. Also, there are high levels of pedestrian activity occurring within this zone, making it an important area for internal pedestrian movements (between shops and to car parking).

Secondary Pedestrian Activity Generators

This includes shops, schools, sporting facilities, clubs, hospitals and community facilities such as churches that are not located within the Primary Pedestrian Activity Zone (such as Strathfield Park). These land uses will attract people, but possibly only at certain times of the day or week.

Tertiary Pedestrian Activity Generators

These include the above land uses from the Secondary Activity Generators, but differentiate them based on a lower level of activity. Again, these are not located within the Primary Pedestrian Activity Zone.

Primary Pedestrian Routes

These are routes from residential areas to the Primary, Secondary and Tertiary Activity Zones and Generators. They are trunk or collector level routes, which do not reach every property but instead form a network of routes that are accessible to a significant catchment of population. These routes take account the existing street network and topographical constraints, aiming to provide a direct and convenient route to the major trip generators. The demographic use of connecting generators is considered when defining the routes (i.e. schools and playing fields, aged care facilities and return service league clubs).

6.3.2 Identification of Infrastructure Provision Goals

The hierarchy above provides a basis for applying standard treatments, ensuring the development of a comprehensive and structured pedestrian network. Specific treatments may be required in some of these areas to accommodate the user needs or where other community suggestions are made.

These treatments form the basis of the proposed improvements. While this standard may not be achievable in the short-term due to the capital investment required, it is nevertheless a useful guide to work towards.

Desirable scenarios for potential infrastructure responses are outlined in Table 6-3.

Table 6-3 Infrastructure Provision Goals for Urban Areas in Strathfield

Hierarchy Feature	Desirable Route Infrastructure	Minimum Route Infrastructure
Primary Pedestrian Activity Zone – including around Strathfield Square	Footpaths of both sides of road adjacent to the generators within the Primary Pedestrian Activity Zone of full width between the property line and kerb line (typically 3-4 m).	Footpaths of both sides of road adjacent to the Primary Pedestrian Activity Zone of 2 m widths.
	Multiple assisted road crossings (pedestrian crossings or refuges).	Assisted road crossings where required by high traffic volumes.
Secondary Pedestrian Activity Generators	Footpath on the side of the road adjacent to the Activity Generator of 2 m widths.	Footpath on the side of the road adjacent to the Activity Generator of 1.2 m widths.
	Assisted road crossings at all Activity Generators.	Assisted road crossings where required by high traffic volumes and/or pedestrian types.
Tertiary Pedestrian Activity Generators	Footpath on the side of the road adjacent to the Activity Generator of 1.2 m widths.	Footpath on the side of the road adjacent to the Activity Generator of 1.0 m widths.
	Assisted road crossings where required by high traffic volumes and/or pedestrian types.	Assisted road crossings where required by high traffic volumes and/or pedestrian types.
Primary Pedestrian Routes	Footpath on one side of the road of 2 m widths, footpath on other side of the road of 1.2 m widths.	Footpath on one side of the road of 1.2 m widths.
	Assisted road crossings at most cross streets.	Assisted road crossings at major cross streets with high traffic volumes.
	Directional signage to Primary Pedestrian Activity Zones, Secondary and Tertiary Activity Generators for pedestrians.	Directional signage to Primary Pedestrian Activity Zones for pedestrians.

6.3.3 Aims in the Development of Infrastructure Recommendations

Major aims of the proposed improvement works, in decreasing order of priority, are:

- Fill any shortcomings in the Primary Pedestrian Activity Zone areas through new footpaths and crossing points, particularly if safety issues have been raised;
- Establish a network of key pedestrian routes in the town centre and between major trip generators including schools. Prioritised routes are those that serve a wide range of community users and can remove pedestrians from unsafe environments;
- Broaden the extent of the network to areas outside of the Primary Pedestrian Activity Zones; and
- Provide additional pedestrian routes for primarily recreational or tourism purposes.

Additionally, crossing points are generally catered for via pedestrian refuges, rather than a zebra crossing or signalised crossing. This is because there are onerous requirements to install marked pedestrian crossings in terms of pedestrian and vehicle warrants, as described by the Australian Standards requirements of AS 1742 Part 10. Refuges are of benefit to pedestrians as

they allow for a staged crossing of a road and provide a visual cue for motorists that pedestrians can be expected in the vicinity of a refuge.

7. Planning for Bicycle riders

Bicycle riding as a normal form of transport for everyday activities is the focus of *AT-Strathfield.* While it is important to ensure a safer network sporting bicycle riders (including some commuters) and recreational riders, the infrastructure and behavioural plans are focused on providing for the mid distance 2 – 5 kilometre trips to jobs, shops, schools and public transport hubs.

This section a provides a summary of guidance on planning for bicycle riding.

7.1 Trip Purpose

Bicycle riding attracts a large variety of participants, a selection of which is outlined in 7.2, many of which have very different motivations for participating. It is particularly important to recognise the needs of each user type to ensure facilities cater and encourage use of current, new and proposed routes.

There is a substantial body of evidence which reveals that there is a difference in what non-bicycle riders and bicycle riders consider as the necessary “enablers” for bicycle riders, particularly for were infrastructure is concerned. For example, non- bicycle riders place more importance on segregated bicycle lanes, whereas regular bicycle riders, particularly males, are more willing to share the road with motorists (even if motorists do not share the same view).

Figure 7-1 Different Bicycle Trip Purposes

The proposed bicycle network will be informed by the data review and consultation activities. *AT-Strathfield* has a 15-year planning horizon so that facilities can be planned and integrated efficiently into future land use and infrastructure development.

7.2 Matching facilities to users

A summary of the bicycle facility types with various comfort levels for different user types if shown in Table 7-1.

Table 7-1 Bicycle Facility Type and User Groups

Facility Type	User Group			
	Vulnerable	Occasional	Regular	Confident
Bicycle Rider User Type	Recreational	Recreational	Local trips / Commuter	Commuter Sport / Cyclist
Full separation, off-road	X	X		
Full separation, on-road		X	X	
Shared paths	X	X	X	X
Bicycle Lanes			X	X
Marked route			X	X
Low speed town centres		X	X	X

7.2.1 Recreational trips

Recreational bicycle riders ride mainly for leisure and place a high value on enjoying the experience. They are usually less constrained by time and vary widely in skill and experience.

Popular recreation bicycle riding destinations include routes along rivers, natural corridors and reserves, as well as attractive routes with low traffic volume and speed.

Recreational bicycle riders prefer:

- Comfort;
- Good surfaces;
- Minimal gradients;
- A high degree of safety and personal security;
- Routes that are pleasant, attractive and interesting;
- Routes that do not require street lighting;
- Circuitous routes with multiple route options;
- Screening from weather and wind; and
- Parking facilities where they dismount to use facilities or visit attractions along the journey.

7.2.2 Local trips

Bicycle riders undertaking local trips ride for transport as well as exercise. They may be using bicycles to access shops and facilities, accompanying children to school or to access other modes of transport at an interchange. These bicycle riders are more concerned with safety and comfort rather than speed or directness.

Local bicycle riders prefer:

- Comfort;
- Traffic safety and separation from cars;
- Parking facilities where they dismount to use facilities;
- Well lit routes with passive surveillance for journeys at all hours; and,
- A high degree of safety and personal security;

7.2.3 Commuter trips

Commuter bicycle riders ride mainly for as a mode of transport for journeys to and from a workplace, school or university. They prefer a more direct, but safer route between their origin and destination and are generally more skilled and experienced.

Commuter bicycle riders prefer:

- Directness;
- Minimal delays;
- Good surfaces;
- All-weather routes;
- Well lit routes for after-hours journeys; and
- Parking facilities and end of trip facilities at their destination.

7.2.4 Sport Bicycle Riders / Cyclists

Sport cyclists ride mainly for fitness and leisure, but like recreational bicycle riders also place a value on enjoying the experience. They are also less constrained by time and have a high skill and experience.

Sport bicycle riding destinations include off-road mountain bike trails in addition to areas which provide continuous on or off-road routes.

Sport bicycle riders / cyclists prefer:

- Comfort;
- Good surfaces or off-road trails;
- Minimal conflict with other road users;
- A reasonable degree of safety and personal security;
- Routes that are pleasant, attractive and interesting; and
- Circuitous routes.

7.3 Creating a Safe and Attractive Environment for Bicycle riding

7.3.1 Background

Bicycle riding is a highly efficient, environmentally benign form of transport. As with walking, bicycle riders are improving their health and contributing to an active environment at a human scale.

Bicycle riders move around the public domain in various ways, largely depending on the trip purpose and rider characteristics. For example, children will tend to use the footpath and ride at low speeds, while an adult on the way to work may ride along the fastest and most direct route available (on- or off-road).

Bicycle riders therefore move through an “environment” in a similar way to pedestrians, although the speed and distance which they travel mean that they identify more with the concept of a network. Attention to bicycle riding facilities should not be confined to one or two “routes” or “links” in an area, as trip origins and destinations are diverse. Every street should be a safe route for bicycle riders and be designed in accordance with the function, traffic volume and width of the street. However, governments have limited funds and need to prioritise expending.

Bicycles are vehicles and infrastructure should be with consideration of speed, sight distance, priority at intersections etc. However, bicycles have a degree of manoeuvrability that makes them somewhat unpredictable to motorists and pedestrians. Therefore, the design of both on- and off-road facilities should aim to encourage predictability and clear priority at all conflict points.

To fully integrate bicycles into the transport system, a shift towards bicycle riding needs to be supported with dedicated infrastructure that separates riders from pedestrians and vehicles. Providing a space where their intermediate speeds is accommodated enable bicycle riders to see that they are welcomed and catered for.

7.3.2 Bicycle Rider Needs

As for pedestrians, the provision of bicycle infrastructure should not only aim to fulfil the requirements of existing users, but to increase the number of bicycle riding trips in the area. Such an outcome would likely result in fewer car trips (particularly for shorter travel distances), healthier residents and a more active (and safe) streetscape.

A number of elements are required in order to provide a high quality bicycle riding environment. These include:

Safety

Bicycle riders are particularly vulnerable road users. They are slower and smaller than the dominant vehicles in traffic, making them less likely to be seen. Furthermore, bicycle riders have little protection at times of collisions.

Amenity

People will be more likely to cycle in a pleasant environment. The route should be scenic, quiet, and free of heavy traffic and traffic travelling at high speeds. The best bicycle riding environment is often found in areas that have been traffic calmed.

Coherence

Coherence refers to the extent of coverage and completeness of the bicycle facilities. Within built-up areas, coherence can be characterised by the completeness of the network. Outside built-up areas, it is characterised by the completeness of connecting routes. It also refers to how the bicycle routes and network matches with the need to travel, offering a consistent quality across individual paths, continuity of paths and routes, and the ability to provide users with freedom of route choice.

Directness

Most bicycle riders do not like significant deviations to their route. However, some flexibility can be expected where a better bicycle riding environment is provided on a minor deviation from the most direct route. A careful balance must be found between providing a direct route and also one free of delays or safety concerns.

Suitable for all users

Bicycle riders cover a large range of user skill levels and trip purposes. While skill level often depends on age, other factors such as frequency of bicycle riding and carrying heavy loads can affect a user's actions. Trip purposes often dictate the preferred bicycle riding facility. If one type of bicycle facility is unable to provide for all users of that route, a parallel facility with on and off-road infrastructure could be considered.

End of trip facilities

Bicycle users need secure facilities, such as bike racks and lockers in high visibility areas that are well lit, as well as being protected from the weather. Whenever feasible in the planning, new office buildings and workplaces should be designed to include shower and change rooms.

7.3.3 Bicycle riding strategies

Council should support and encourage bicycle riding through the following actions:

- Actively promote bicycle riding through the provision of quality bicycle riding facilities and the establishment of an attractive and amenable bicycle riding environment;
- Build a network of primary cycle routes within the LGA. These should serve key local and regional bicycle riding demand and provide direct and convenient links between commuting, social and recreational destinations;
- Bicycle access to this network should be promoted through the establishment of an ambient traffic environment that makes local roads bicycle-friendly;
- Provide secure parking and 'end-of-trip' facilities for bicycle riders;
- Utilise traffic calming and reduction of speed limits (to 40 km/h) where necessary to lower the speed environment on local roads; and
- Develop policies, guidelines, training and assessment measures to ensure that the needs of bicycle riders are considered when planning and designing traffic facilities and other elements of the urban environment.

7.4 Methodology for Identifying Bicycle Rider Needs

7.4.1 Identification of Activity Generators and Primary Routes

The following approach was adopted in developing a hierarchy of bicycle rider needs.

Primary Activity Zone

This is typically the main commercial street in the town centre. Throughout the day, pedestrians and bicycle riders are attracted to this zone from surrounding residential areas. It is therefore an important trip attractor. Also, there are high levels of activity occurring within this zone, making it an important area for short trips. The provision of bicycle parking should also be considered in primary activity zones.

Secondary Activity Generators

These include shops, schools, sporting facilities, clubs, hospitals and community facilities such as churches that are not located within the Primary Activity Zone. These land uses will attract people, but possibly only at certain times of the day or week.

Tertiary Activity Generators

These include the above land uses from the Secondary Activity Generators, but differentiate them based on a lower level of activity. Again, these are not located within the Primary Pedestrian Activity Zone.

Strategic Bicycle Routes

These are routes which connect the Major Centres identified in TfNSW's *Sydney's Cycling Future*. These routes are highway / regional level routes providing direct and continuous bicycle routes between the Major Centres. Although these are regional routes, it is the NSW State

Government's preference to provide fully separated cycleways where possible for the strategic routes in order to enable non-confident bicycle riders to travel to work / school by bicycle.

Primary Bicycle Routes

These are routes from residential areas to the Primary, Secondary and Tertiary Activity Zones and Generators. They are trunk or collector level routes, which do not reach every property but instead form a network of routes that are accessible to a significant catchment of population. These routes take account the existing street network and topographical constraints, aiming to provide a direct and convenient route to the major trip generators. The demographic use of connecting generators is considered when defining the routes (i.e. schools and playing fields, aged care facilities and return service league clubs).

7.4.2 Blackspots

Through the analysis of crash data and public and stakeholder consultation undertaken, the following 'Black Spots' have been noted. In general, these locations have been cited as being locations where bicycle riders feel particularly unsafe or vulnerable; or which have been noted from the crash investigation undertaken in Section 1.

There were no accident blackspots for bicycle riders identified as part of the crash data review.

7.4.3 Identification of Infrastructure Provision Goals

The hierarchy above provides a basis for applying standard treatments within town centres, ensuring the development of a comprehensive and structured bicycle network. Specific treatments may be required in some of these areas to accommodate the user needs or where other community suggestions are made.

These treatments form the basis of the proposed improvements. While this standard may not be achievable in the short-term due to the capital investment required, it is nevertheless a useful guide to work towards.

The proposed infrastructure responses are outlined in Table 7-2.

Table 7-2 Infrastructure Provision Goals for Strathfield

Hierarchy Feature	Desirable Route Infrastructure	Minimum Route Infrastructure
Strategic Routes	Fully separated bicycle paths where possible (min 2.4 m two-way width).	Bicycle path constructed between the kerb and car parking.
Primary Activity Zone	Fully separated bicycle paths where possible (min 2.4 m two-way width).	Bicycle riders integrated into general traffic lanes in a traffic calmed environment. Traffic speed limit reduced to 40 km/h. Bike parking provided throughout the Primary Activity Zone.
Local Routes	Fully separated bicycle paths where possible (min 2.4 m two-way width) On-street cycle lane (min 1.5 m width) in both directions in traffic calmed environment.	Bicycle riders integrated into general traffic lanes in a traffic calmed environment. Traffic speed limit reduced to 40 km/h. Bike parking provided throughout the Primary Activity Zone.

Hierarchy Feature	Desirable Route Infrastructure	Minimum Route Infrastructure
Secondary Activity Generators	Low speed bicycle riders to share a 2-2.5 m path with pedestrians adjacent to the Activity Generators, to be marked as two-way with a centreline. Higher speed bicycle riders to use cycle lanes or share general traffic lanes. Cycle parking provided near the entrance of the Activity Generators.	Bicycle riders integrated into general traffic lane.
Tertiary Activity Generators	Bicycle riders integrated into general traffic lane.	Bicycle riders integrated into general traffic lane.
Recreational / Daytime routes	Riders to share a 2-2.5 m path with pedestrians adjacent to the Activity Generators, to be marked as two-way with a centreline.	

7.4.4 Aims in the Development of Infrastructure Recommendations

Major aims of the proposed improvement works, in decreasing order of priority, are:

- Establish a network of key cycle routes in the LGA, connecting neighbouring LGAs and between major trip generators including schools. Prioritised routes are those that serve a wide range of community users and can remove pedestrians from unsafe environments;
- Fill any shortcomings in the Primary Activity Zone areas within town centres and local centres through new cycle paths and footpaths;
- Broaden the extent of the network to areas outside of the Primary Activity Zones; and
- Provide additional cycle routes for primarily recreational or tourism purposes.

7.5 Selecting the Appropriate Path Type

7.5.1 Types of Bicycle Paths

A number of path types have been described in various technical guidelines to assist decision-makers in selecting the appropriate treatment to suit local conditions. Bicycle paths can either be on-road, which are essentially “bicycle lanes” alongside motor vehicle traffic on a roadway within the road corridor, or off-road paths, which are separated from the road corridor.

The selection of the appropriate path type treatment depends on a combination of factors, which may include the level of demand for the bicycle path, the conditions present in the surrounding environment, the availability of space in which to provide the path, and whether path usage is for exclusive cycle use or shared use with pedestrians.

7.5.2 Separation Treatment

Market Research and usage surveys by City of Sydney Council have shown that non-confident bicycle riders prefer full separation from vehicles and pedestrians. Transport for NSW has identified that full separation is the preferred treatment type for bicycle riders on strategic routes and where there is a goal for higher volumes.

While reducing road speeds reduces the injury risk to bicycle riders from higher speed crashes, it does not address they safety concerns that is required to increase bicycle riding among novice bicycle riders.

A key concern with separation is the impact on car parking and / or trees. Separation can be achieved in the following ways with minimal impact on access, parking and trees.

- Narrowing parking and traffic lanes to provide space for separated paths.
- Relocating street furniture or wider footways to provide a clear space for bicycles on separated paths.

Figure 7-2 shows a separation treatment applied in the City of Sydney that integrates an urban amenity upgrade and is suitable for a Primary Activity Zone.

Figure 7-2 Separated Path Treatment 1

Figure 7-3 shows a basic separation treatment that can be applied in residential or industrial areas – also applied in the City of Sydney.

Figure 7-3 Separated Path Treatment 2

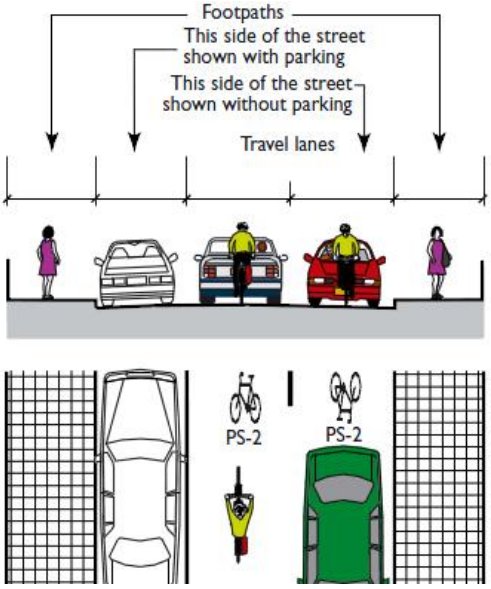
Source: City of Sydney

7.5.3 On-Road bicycle facilities

A number of different path treatments can be applied for on-road bicycle facilities. These are presented and discussed in the *NSW Bicycle Guidelines* (NSW Roads and Transport Authority (RTA), now the RMS), 2005). The different on-road path types may provide physical or visual separation from the adjacent roadway, or allow for mixed bicycle-motor vehicle traffic.

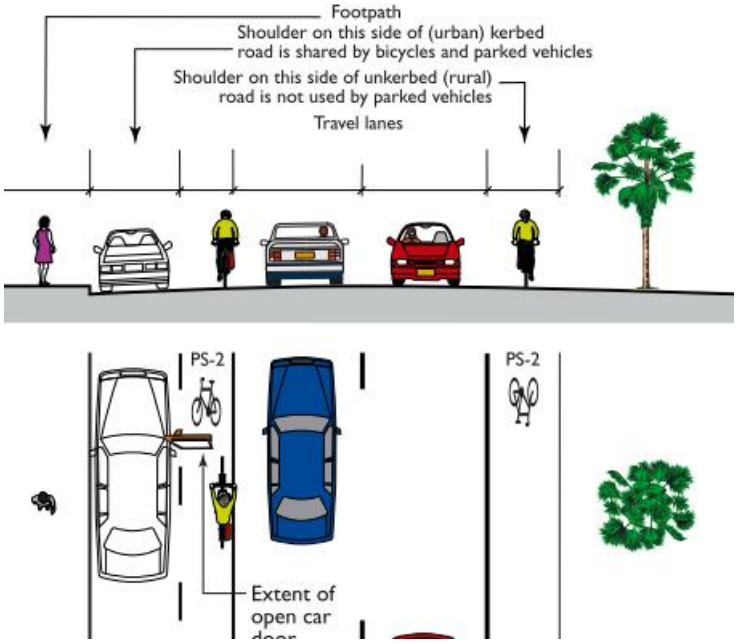
In the context of *AT-Strathfield*, on-road bicycle paths would typically be provided with some form of physical or visual separation from the adjacent traffic lane or by providing mixed traffic routes where bicycles and traffic share the road space. The on-road paths considered in this Plan are typically of the layout and cross section as shown in Figure 7-4 and Figure 7-5.

Figure 7-4 Typical Plan and Cross-Section for On-Road Mixed Traffic Bicycle Routes



Source: *NSW Bicycle Guidelines*, Roads and Maritime 2005.

Figure 7-5 Typical Plan and Cross-Section for On-Road Bicycle Paths



Source: *NSW Bicycle Guidelines*, Roads and Maritime 2005.

On-Road Bicycle Lane Widths

The width for bicycle lanes will vary depending on the number of bicycle riders, the speed of motor vehicles, the volume of large vehicles and the space available given the needs of other road user groups, physical constraints and budgetary constraints (AUSTROADS, *Part 14 – Bicycles*, 1999). Recommended widths are summarised below and shown in Table 7-3.

Overall, the following widths are recommended:

- 3.0 metres is the absolute maximum width and is desirable where the motor traffic is moving at high speeds (100 km/h);
- At least 2.0 metres is desirable where the motor traffic is moving at high speeds (100 km/h) or where speeds are moderate (80 km/h);
- 1.5 metres is the desirable width to be used in 60 km/h speed zones; and
- 1.2 metres is the absolute minimum width to be used along the length of the lane and should only be used where the provision of a wider lane is impractical.

Table 7-3 Recommended On-Road Bicycle Lane Widths

	Lane Width (m)		
Road Speed	60 km/h	80 km/h	100 km/h
Desirable	1.5 m	2.0 m	2.5 m
Accepted Range	1.2 – 2.5 m	1.8 – 2.7 m	2.0 – 3.0 m

Source: *Guide to Traffic Engineering Practice*, *Part 14 – Bicycles* (AUSTROADS, 1999).

A 1.0 metre width may also be acceptable where the speed environment is less than 60 km/h and space is severely restricted.

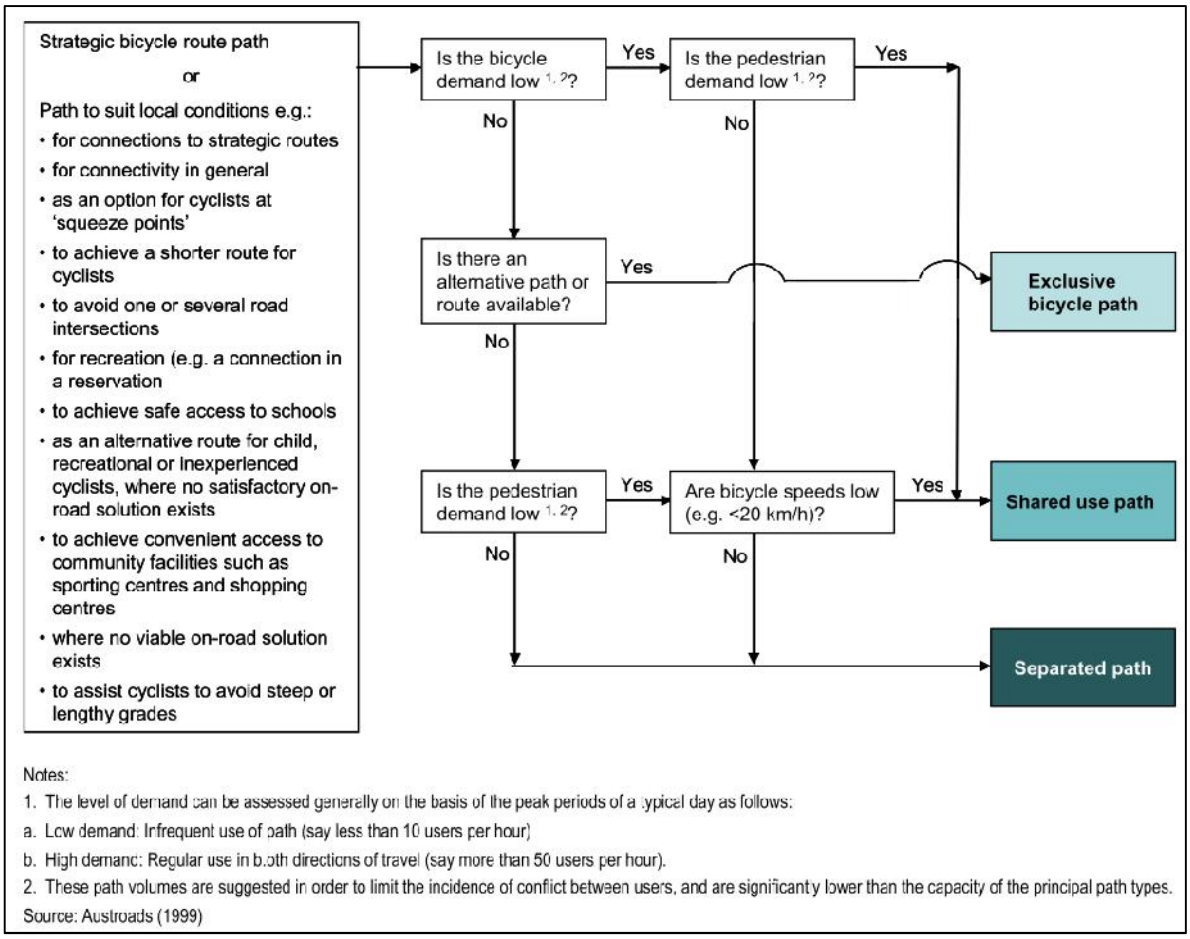
7.5.4 Off-Road Bicycle Paths

Off-road bicycle paths are typically physically separated from adjacent parking or traffic lanes. Off-road paths can be of three basic types:

- Exclusively for bicycle use;
- Shared bicycle rider and pedestrian use; and
- Separate paths provided for bicycle riders and for pedestrians.

The *Guide to Road Design Part 6A: Pedestrian and Cyclist Paths* (AUSTROADS 2009) presents a guide on selecting the treatment type for off-road paths. This is shown in Figure 7-6.

Figure 7-6 Selection Guide for Off-Road Path Types



Source: *Figure 2.1, Guide to Road Design Part 6A: Pedestrian and Cyclist Path (AUSTROADS 2009)*.

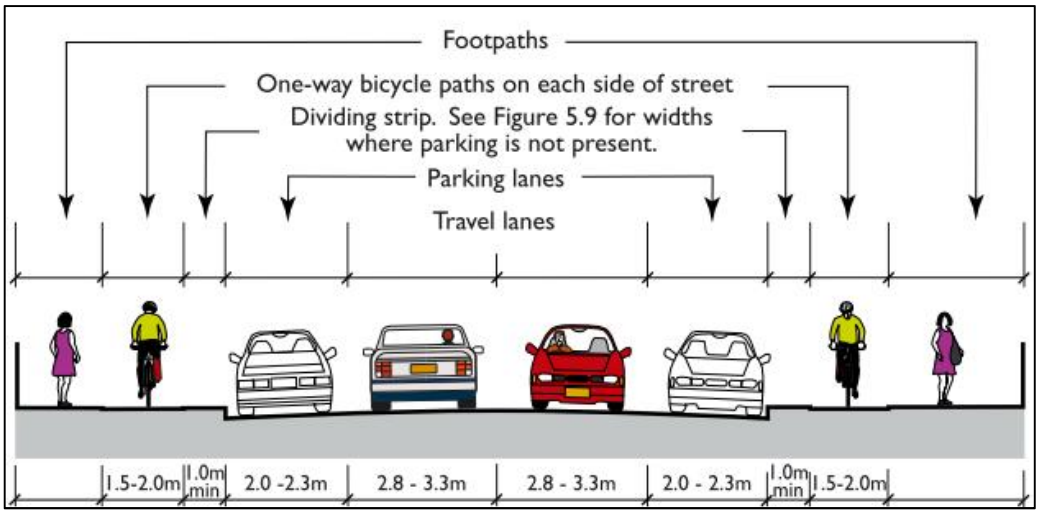
Exclusive Bicycle Paths

According to the AUSTROADS Guide, exclusive bicycle paths are most appropriate under the following conditions:

- There is a significant bicycle riding demand and very few pedestrians desire to use the path or a separate footpath is provided;
- There is very limited motor vehicle access across the path; or
- It is possible to achieve an alignment that generally allows bicycle riders uninterrupted and safe travel at a relatively high constant speed (say 30 km/h).

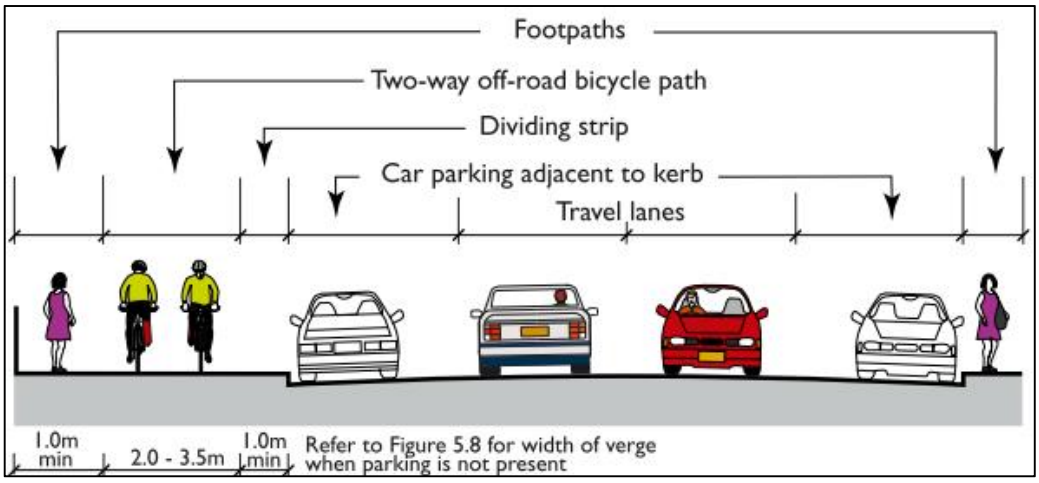
Figure 7-7 presents a typical road cross section for a one-way pair of off-road cycle paths, while Figure 7-8 shows the same for a two-way off-road exclusive cycle path on one side of the road. For local conditions where kerbside parking is not present, the dividing strip or separating verge would not be required.

Figure 7-7 Typical Cross-Section - One-Way Pair of Off-Road Bicycle Paths



Source: *NSW Bicycle Guidelines*, Roads and Maritime 2005.

Figure 7-8 Typical Cross-Section - Two- Way Off -Road Bicycle Path on One Side of Road



Source: *NSW Bicycle Guidelines*, Roads and Maritime 2005.

The AUSTROADS Guide also prescribes the design widths for exclusive cycle paths. These are shown in Table 7-4.

Table 7-4 Path Widths – Exclusive Bicycle Paths

	Path Width	
	Local Access Path	Major Path
Absolute Minimum Width	2.4	4.4
Desirable Minimum Width	2.5 m	3.0 m
Minimum width – typical maximum	2.5 – 3.0 m a	2.5 – 4.0 m b
a: A lesser width should only be adopted where bicycle riders volumes and operations speeds will remain low. b: A greater width may be required where the number of bicycle riders is very high.		

Source: *Guide to Road Design Part 6A: Pedestrian and Cyclist Path (AUSTROADS, 2009)* adapted by GHD

Shared Use Paths

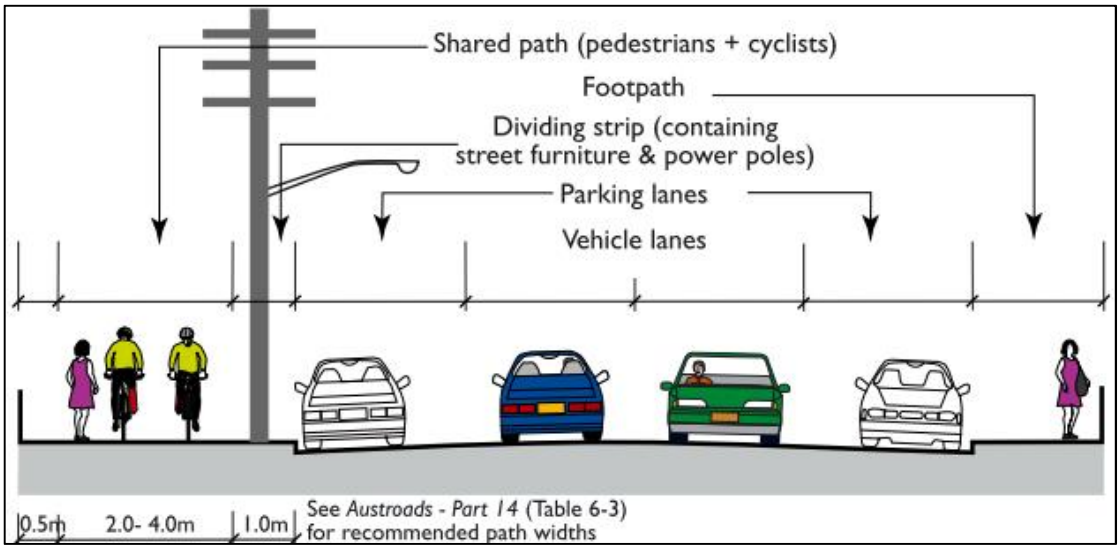
Shared use paths, or shared paths, are a type of off-road facility that allows common use of the facility by both bicycle riders and pedestrians.

According to the AUSTROADS Guide, a shared use path may be appropriate where:

- Demand exists for both a pedestrian path and a bicycle path but where the intensity of use is not expected to be sufficiently great to provide separate facilities;
- An existing low-use footpath can be modified to provide for bicycle riders by satisfying legal requirements and as necessary upgrading the surface, width and kerb ramps; or
- There is an existing road nearby which caters well for faster bicycle riders (e.g. has on-road bicycle lanes), to limit the extent of user conflict on the shared path.

A typical cross section of a shared path (two-way) is shown in Figure 7-9 (left hand portion of drawing).

Figure 7-9 Typical Cross-Section for a Two-Way Off-Road Shared Path



Source: *NSW Bicycle Guidelines*, Roads and Maritime 2005.

An indication of widths for shared paths is provided in Table 7-5.

Table 7-5 Shared Path Widths

	Path Width		
	Local Access Path	Commuter Path	Recreational Path
Desirable Minimum Width	2.5 m	3.0 m	3.5 m
Minimum width – typical maximum	2.5 m (a) – 3.0 m (b)	2.5 m (a) – 4.0 m (b)	3.0 m (a) – 4.0 m (b)
a: A lesser width should only be adopted where bicycle volumes and operations speeds will remain low. *b: A greater width may be required where the number of bicycle riders and pedestrians are very high or there is a high probability of conflict between users.*			

Source: *Guide to Road Design Part 6A: Pedestrian and Cyclist Path (AUSTROADS, 2009)*.

Separate Paths

Where there are significant volumes of both pedestrians and bicycle riders, separate paths for each may need to be provided to minimise conflict issues associated with shared use of paths. Typically, separate paths would require a minimum of 3.0 metres on each side of the road for one-way paths, and 4.5 metre wide off-road paths for separated two-way paths.

The AUSTROADS *Guide to Road Design Part 6A: Pedestrian and Cyclist Paths* notes that such separated paths are rarely provided. Such is the case in Strathfield, where pedestrian and bicycle rider volumes are still at levels which will not require separated paths to be provided.

7.5.5 Intersections

Roundabouts

Bicycle riders often have safety concerns at intersections, primarily at roundabouts. Roundabouts do not provide for a comfortable environment for either pedestrians or bicycle riders as the driver's attention is focused on watching for vehicles entering or on the roundabout. For this reason, roundabouts are not recommended on any primary or local bicycle or walking routes.

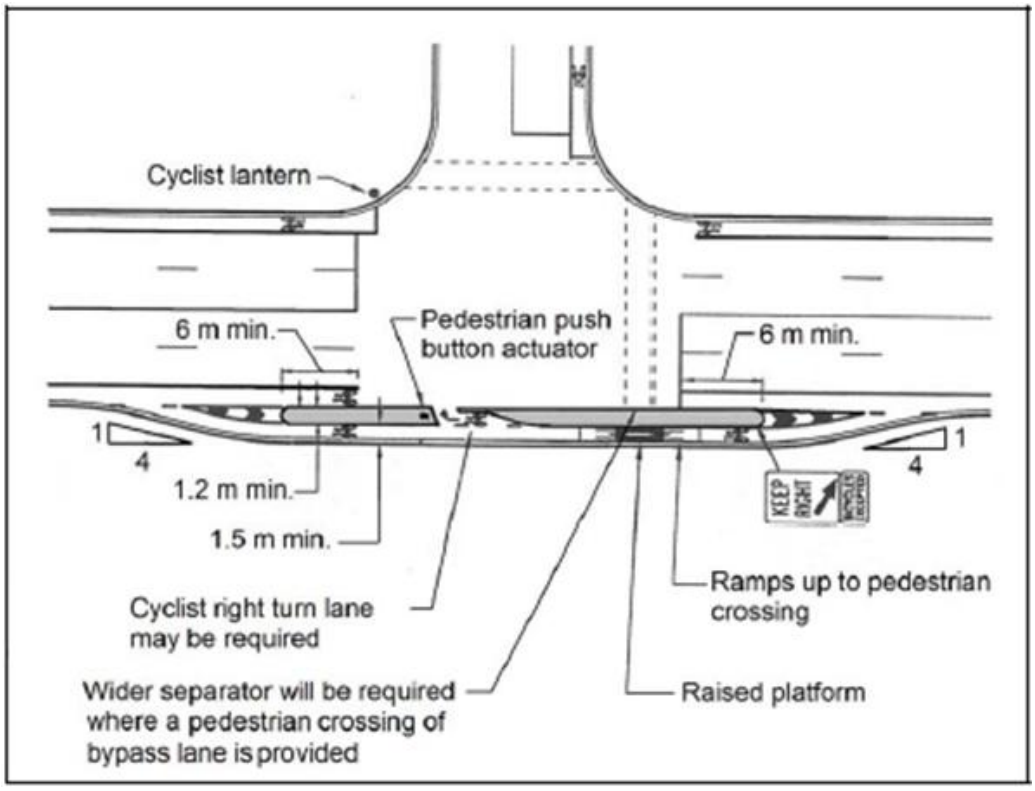
Bike Boxes

Expanded Bicycle Storage Areas (or 'Bike Boxes') assist bicycle riders with both left and right turning movements. These areas continue the preceding bicycle lane to a distance of 4 to 5 metres beyond the motor vehicle stop line and they vary in width to suit the number of traffic lanes that they are to be expanded in front of. A stop line truncates the bicycle lane. Bike boxes are usually only provided at signalised intersections on the minor road.

Bike Hook Turns

Bike hook turns provide improved safety for bicycle riders that want to turn right at signal controlled intersections. These allow bike riders, to safely pull into the side of the road and push the signal button. Bicycle riders are then signalled to turn and clear the intersection before general traffic. An example of a bike hook turn layout is shown in Figure 7-10.

Figure 7-10 Bike Hook Turn Layout



Source: Austroads Guide to Road Design – Part 4A: Unsignalised and Signalised Intersections (2009), Figure 10.3

7.5.6 Bicycle Advisory Marking

Distinctive Coloured Pavement Bicycle Lanes

The purpose of green coloured pavement for on-road bicycle lanes is to enhance the visibility and recognition of bicycle lanes to reduce the chance of conflict between motor vehicles and bicycles. On-road green coloured bicycle lanes can be considered in areas of 'high potential conflict' between motor vehicle and bicycle traffic. Areas of 'high potential conflict' between motor vehicles and bicycle traffic include those segments of on-road bicycle lane where motor vehicle traffic is legally permitted to cross the double continuity lines.

Bicycle Information Pavement Stencils

Pavement stencils are used to advise bicycle riders about a changing road environment. Examples of pavement stencils used in South Australia are shown in Figure 7-11. The pavement stencil is located approximately 5 metres ahead of the platform to warn bicycle riders to merge with traffic before reaching the platform where the traffic lanes narrow.

Figure 7-11 Examples of Pavement Stencils

Advising of a potential conflict between pedestrians and bicycle riders.

A "Cyclists Dismount" marking on the shared bicycle path in Glenelg, Australia

7.5.7 Bicycle Parking

Bicycle Enclosures (Long Term Parking)

Bicycle enclosures as shown in Figure 7-12 may be suitable to be installed when a high demand for commuter bicycle riding occurs, such as at the train stations or town centres. They can also be considered at other high demand locations for bicycle riders, such as at schools/TAFE.

Figure 7-12 Secure Bicycle Enclosures

Bicycle enclosure at Upper Mt. Gravatt busway station in Brisbane

Bicycle enclosure on the Gold Coast, Queensland

7.5.8 Wayfinding and Public Art along Bicycle Corridors

High quality wayfinding signage and public art along bicycle corridors can enhance the bicycle riding experience as shown in Figure 7-13. These types of initiatives may be considered along the major inter-regional bike routes passing through the study areas.

Figure 7-13 Wayfinding Signage and Public Art along Bikeways

High quality wayfinding signage along the Mike Turtur Bikeway in Adelaide, South Australia

Public art and interpretive signage along the Mike Turtur Bikeway in Adelaide, South Australia

8. Consultation

Community and key stakeholder consultation has been a crucial part of the development of the new *AT-Strathfield* for Strathfield to ensure the new Plan meets the needs of the community now and into the future. Consultation was undertaken through workshops and online community surveys, with an overview of this process and the key outcomes provided in the following sections.

8.1 Aims

The overarching aims of the consultation process were to:

- Provide opportunities for the community to have input into the development of the new *AT-Strathfield* including the identification of gaps in the network, priority routes and changes that could be made to improve walking and bicycle riding in Strathfield;
- Allow the project team to better understand the community's walking and bicycle riding behaviours including barriers and enablers to walking and bicycle riding;
- Provide information about the project process to the community; and
- Involve the community in the planning process to increase the sense of ownership of the project outcomes.

8.2 Methodology

GHD conducted the following consultation activities to seek stakeholder and community input into the development of *AT-Strathfield* for Strathfield.

8.2.1 Stakeholder Workshop

Council invited a range of key stakeholders including Roads and Maritime Services, Bicycle NSW and the representatives from the neighbouring Councils to a workshop in June 2016 AT-Strathfield Council Library in Homebush. The purpose of this workshop was to identify the key outcomes for the new *AT-Strathfield* and to identify the opportunities, constraints and priorities for bicycle route connections in Strathfield and to the neighbouring councils. Opportunities and constraints for pedestrian routes and infrastructure were also discussed.

8.2.2 Community Survey

A community survey was developed to capture the views of the broader community about the current bicycle riding conditions in the LGA. Information about walking and bicycle riding behaviours (including barriers and enablers) and feedback on bicycle riding facilities and routes that could be improved in Strathfield. Responses from bicycle riders and non- bicycle riders were sought to ensure the new *AT-Strathfield* addresses the needs of current and potential bicycle riders in the community.

To understand the current needs, GHD developed two surveys, including a:

- Bicycle Riding Survey; and
- Walking Survey.

The surveys were made available online to capture a broader cross-section of stakeholders, including users not local to the Strathfield area. The surveys were advertised on Council's website and also provided to local Bike User Groups via email from Bicycle NSW.

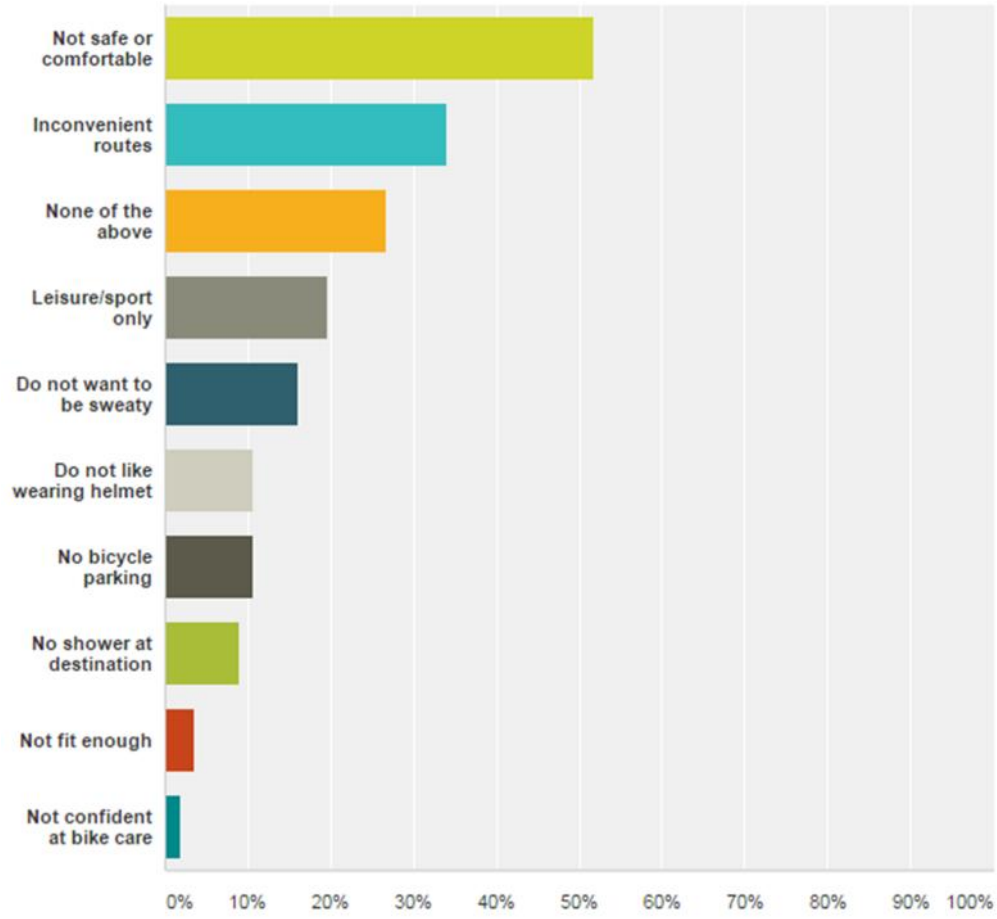
The Bicycle Riding Survey received a total of 59 responses. The Walking Survey did not receive any responses. This report provides an analysis of the Bicycle Riding Survey results only, including the key issues and priorities raised by the community. The complete Community Consultation Report is provided in Appendix A.

Reasons Why People Did Not Ride Bicycles

Respondents were asked why they do not ride more reguarly for everyday local trips or commuting to work or study. The most common responses were:

- Available routes are not safe or comfortable (52 percent);
- Routes are not convenient (34 percent);
- None of the above (27 percent);
- They cycle only for leisure, recreation or sport (20 percent);
- They do not want to be sweaty when they reach their destination (16 percent; and.
- They do not like wearing helmet or there is no bicycle parking at their destination (both 11 percent).

Figure 8-1 Reasons Why People Did Not Ride Bicycles More Regularly



Popular Routes

To identify the most common bicycle routes used by bicycle riders, respondents were asked to list their main journeys. Fifteen respondents did not answer. Similar responses were grouped by location. The most common routes/locations were:

- Olympic Park/Stadium (e.g. roads including Maria, Homebush and Francis) (30 percent);

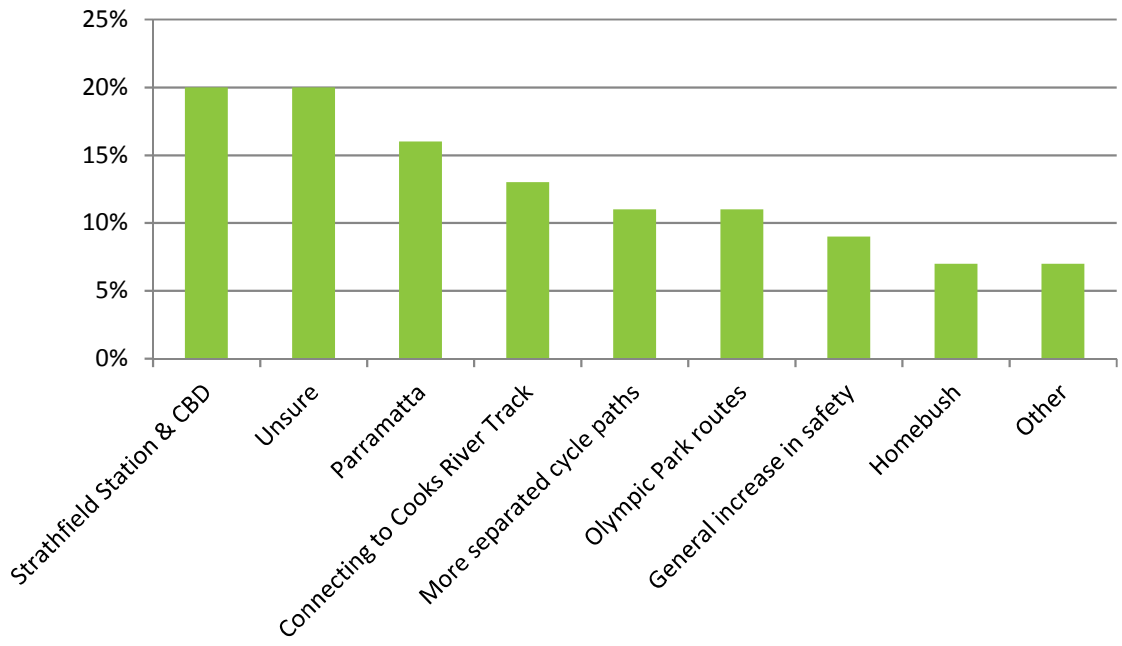
- The Cooks River Track (25 percent);
- Parramatta (including Parramatta Road) (18 percent);
- Strathfield Station (e.g. roads including Barker, Gladstone, Wentworth, Everton, Coronation) and Concord (e.g. roads including Correys, Flavelle) (both 16 percent);
- Park Road, Homebush (nine percent);
- Burwood, North Sydney, Homebush Bay (seven percent for each); and
- Croydon Park and Summer Hill (both five percent).

Gaps and Potential Improvements

Respondents were asked to identify gaps and potential improvements for the Strathfield bicycle network. The biggest concern for respondents were:

- Strathfield Station and Strathfield CBD (20 percent);
- Parramatta Road (16 percent),
- roads and paths connecting to Cooks River Track (14 percent);
- Olympic Park routes (11 percent), and
- Need for more separated cycle paths (11 percent).

Figure 8-2 Gaps and Potential Improvements for the Existing Bicycle Network



Encouraging bicycle riding

Respondents were provided with a list of potential improvements and asked to rank whether or not the change would encourage them to definitely cycle more, maybe cycle more or make no difference. Respondents felt that they would definitely cycle more if:

- There were more separated bicycle paths available, and increased driver awareness of bicycle safety and road sharing (both 80 percent);
- There were more dedicated bicycle lanes on roads (78 percent);
- There were better connections between bicycle paths and public transport (73 percent);

- More bicycle riders were on the road (54 percent);
- Bicycle parking was available at their destination (48 percent); and
- Shower and changing facilities were available at their destination (36 percent).

Improvements which respondents felt would make no difference in bicycle riding behaviour included:

- Increasing knowledge of bicycles and bicycle maintenance, and improved bicycle riding skills (both 63 percent); and
- Improving confidence riding on shared paths with pedestrians (54 percent).

8.2.3 Bicycle User Groups (BUGs)

Bicycle NSW invited a range of stakeholders from bicycle user and community groups to provide feedback on a preliminary version of the proposed bicycle network plan for the Strathfield LGA. The purpose of this consultation was to inform the BUGs to help shape the development of a vision for the plan and to identify gaps in the current network. These stakeholders provided comment via email and also through the online community survey.

Comments provided by the Canada Bay BUG (BayBUG) are provided at Appendix B.

8.3 Outcomes

The consultation activities undertaken have allowed Council and the project team to better understand the bicycle riding behaviours of the Strathfield community, the current enablers and barriers to bicycle riding, gaps in the existing bike network and opportunities for improving bicycle riding conditions, facilities and connectivity.

A community consultation report has been developed to summarise the responses from the community survey, which is provided at Appendix A, with the key outcomes summarised below:

- Main improvements for encouraging bicycle riding include;
  - more separated bicycle paths;
  - increased driver awareness of bicycle safety and road sharing;
  - more dedicated bicycle lanes on roads; and
  - better connections between bicycle paths and public transport.
- Improvements that would enable children to ride or walk more regularly include
  - providing safer routes;
  - implementing walking and bicycle riding programs for the school;
  - providing maps/information on safer routes to the school; and
  - providing safe crossings.
- Biggest concern for bicycle networks are:
  - around Strathfield Station and Strathfield CBD;
  - Parramatta Road;
  - paths connecting to Cooks River Track and Olympic Park; and
  - need for more separated bicycle paths.

9. Existing Facilities Audit

This section provides a review of existing conditions for walking and bicycle riding within the Strathfield LGA. The review is based on a combination of site audits, review of mapping or existing walking and bicycle networks and infrastructure and traffic count data.

9.1 Process

An audit of existing cycle conditions across the LGA was undertaken for the study. The audit focused on identifying existing facilities currently provided in the Strathfield LGA and any shortcomings in relation to walking and bicycle riding facilities and potential safety issues. The audit was undertaken by means of a desktop review of Council provided data, a drive through with a Council Officer and "saddle survey" of the study area, carried out to ascertain the extent of the built pedestrian and bicycle network and the general traffic environment and conditions.

9.2 Primary Roads

Several roads through the Strathfield LGA that provides links to the greater transport network form the boundaries of the study area. These roads include the M4 Western Motorway, Parramatta Road, The Boulevard, Hume Highway (Liverpool Road) and Roberts Road. A brief description of these roads regarding their road hierarchy, average traffic volumes and location with respect to the Strathfield LGA is set out below.

M4 Western Motorway

The M4 Western Motorway is a two-way motorway road with an Average Daily Traffic Count (AADT) of 91,164 according to RMS Traffic Volume Viewer (2015). The road functions as an arterial road that provides two traffic lanes in each direction divided through the Strathfield LGA.

The motorway passes through Homebush between North Strathfield and Strathfield and the northern side of the study area. In terms of the study area, the eastern end of the motorway is located in North Strathfield at Parramatta Road and the next entry/exit point is at Homebush Bay Drive south of Sydney Olympic Park. The M4 Motorway has a variable sign posted speed limit, although is generally 90 km/h through the Strathfield LGA.

Parramatta Road

Parramatta Road is one of the main arterial roads in Sydney, with an AADT of 40,194 according to RMS Traffic Volume Viewer (2015). The road provides a direct link between the Central Business District and Parramatta and has three lanes in each direction through this area.

Parramatta Road runs parallel and to the south of the M4 through the Strathfield LGA. Like the M4, it also separates North Strathfield and Strathfield. Land uses along Parramatta Road includes retail and car dealerships. It has links to streets that connect between North Strathfield and areas to the south. The signposted speed limit is 60 km/h.

Hume Highway (Liverpool Road)

The Hume Highway (Liverpool Road) functions as an arterial road, with an AADT of 53,099, based on data provided from the Roads and Maritime Traffic Volume Viewer website (2015).

Hume Highway generally provides three lanes in each direction during clearway operations, providing a link through Strathfield South and over the Cooks River towards Bankstown. Land uses along the Hume Highway in the Strathfield LGA include residential properties retail, fast food restaurants and service stations. It generally has a sign posted speed limit of 60 km/h.

Roberts Road

Roberts Road functions an arterial road, providing a link between Bankstown and Sydney Olympic Park. Land uses along Roberts Road include residential and retail development including Chullora Marketplace and Bunnings Warehouse. There are several bus stops along Roberts Road. It has a sign posted speed of 70 km/h.

Homebush Road

Homebush Road is a regional road with one traffic lane and one parking lane provided in each direction. Land uses along Homebush Road are predominantly residential and it has a sign posted speed of 50 km/h.

The Boulevarde

The Boulevarde functions as a two lane undivided regional road that connects Strathfield Town Centre in the north to Coronation Parade in the south. The Boulevarde has an AADT volume of 22,250, based on data provided from the Roads and Maritime Traffic Volume Viewer website (2015).

The Boulevarde provides access to residential properties and educational facilities including the Santa Sabina College. it has a general urban speed limit of 50 km/h and a school zone speed limit of 40 km/h during school zone operation.

9.3 Existing Facilities

Based on the desktop review and site assessment of existing facilities within the LGA, there is currently a variety of cycle facility types provided, and in varying conditions. The following section provides an overview of those facilities along with examples of each facility type as observed in the LGA.

9.3.1 On-Street Mixed Traffic Facilities

Existing on-street mixed traffic facilities are provided on streets such as Hillcrest Street. On-street mixed use bicycle routes were designated through the use of bicycle logos on the road surface. An examples of an on-street mixed traffic bicycle route is provided below.

On-street mixed traffic facility provided at Hillcrest Street

9.3.2 On-Street Bicycle Lanes

On-street bicycle lanes are designated through the use of solid white lines with bicycle logos on the road surface. Bicycle lanes are provided along Albyn Road and Australia Avenue.

On-street bicycle path with bicycle logo on Albyn Road

White line marking out shoulder on Australia Avenue

9.3.3 Shared Paths

There are currently a limited number of shared paths are provided across the Strathfield LGA. The Cooks River Cycleway provides a shared path along the western perimeter of the LGA. Other locations with shared paths include the shared pedestrian / bicycle bridge over the M4 Motorway and along Pomeroy Street. The existing shared paths vary in width and designation by way of signage and line marking.

Shared path connecting to pedestrian/bicycle overpass over the M4

Cooks River cycleway shared path.

Off-street shared paths are generally provided at reserves and parkland in the study area, including along the Cooks River and thought Bicentennial Park, Sydney Olympic Park (it is noted that these are not within the Strathfield LGA, but in the Sydney Olympic Park Authority area, which provide a connection to Strathfield LGA)

Off-street shared path through Bicentennial Park, Sydney Olympic Park

Off-street shared path through Bicentennial Park, Sydney Olympic Park

9.3.4 Bicycle Parking and End of Trip Facilities

End of trip facilities are generally provided in the form of bicycle parking. Bicycle parking is typically provided at each of the train stations within the LGA. Several examples were identified at the following Homebush Station, Strathfield Station, Strathfield Station and libraries at South Strathfield and Homebush.

Bike Parking located on The Crescent, Homebush Train Station

Bike parking at High Street Library

9.3.5 Bicycle Lanterns

During the site inspections for this study, no bicycle lanterns were identified at signal controlled intersections within the Strathfield LGA. However, there are shared paths which connect across signal controlled intersections, including at the Pomeroy Street / Underwood Road intersection.

Signalised intersection at intersection of Pomeroy Street and Underwood Road

Bicycle Logo symbol on footpath waiting area at the intersection of Pomeroy Street and Underwood Road

9.3.6 Pedestrian (Zebra) Crossings

Pedestrian crossings are provided across local roads at a number of locations within the Strathfield LGA. The locations of these crossings were noted during the site inspection. Many of these pedestrian crossings do not comply with Austroads standards, including several pedestrian crossings provided in the vicinity of Strathfield Square, adjacent to Strathfield Station.

Pedestrian crossing at Raw Square and Albert Road intersection

Pedestrian crossing at Albert Road, Strathfield Station interchange

9.3.1 Pedestrian Refuge Crossings

During the site inspections, it was noted that many of the existing pedestrian refuge crossings were not to current standard or of poor quality.

9.3.2 Footpath Quality

The majority of streets in the Strathfield LGA generally have footpaths provided along both sides of the road. The quality of the footpath condition in some locations was identified as being poor

9.3.3 Public Seating

Benches are currently provided *AT-Strathfield* Square, near some educational facilities, outside the libraries, train stations and at reserves, including along the Cooks River.

9.4 Existing Issues

Some of the existing issues for bicycle riders in the Strathfield LGA are shown in the following sections.

No Bicycle facilities are provided at intersection of Homebush Bay Drive and Underwood Road

Cycle Hazard Sign alerting bicycle riders of deteriorated pavement condition

Deteriorated surface quality of the shared path through Mason Park

Missing link at Pomeroy Street due to presence of bridge barrier and guardrail

Lack of Bicycle Parking racks to securely lock up their bicycles at Flemington Station

Poor quality footpath surface along both sides of Parramatta Road

No pedestrian refuge crossing at western side of Albyn Road and Homebush Road intersection

Uneven brick footpath, results in trip hazard due to tree roots AT-Strathfield Square

Pedestrian fence The Boulevarde / Parnell Street intersection. Push button for pedestrian signal crossing is located away from crossing/

Faded zebra crossing markings

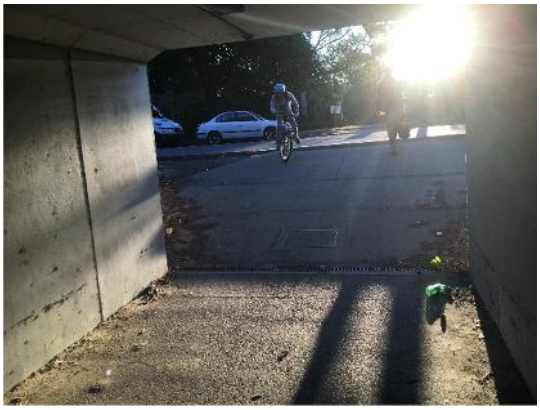
Poor footpath surface quality on the southern side of Redmyre Road

Faded lines at signalised pedestrian crossing at intersection of The Boulevard and Morwick Street

Cracked and uneven footpath on western side of The Boulevard

Cracked and uneven footpath on eastern side of The Boulevard

Underpass beneath Centenary Drive to Sydney Market –no pedestrian crossing facilities are provided across Memorial Drive



Underpass beneath Centenary Drive to Sydney Market - western side of Memorial Drive

Underpass beneath Centenary Drive to Sydney Market. Poor visibility for pedestrians and no crossing provided across two traffic lanes –west side at Memorial Drive

10. Network Development

This section describes the methodology used for identifying user needs and the network development and outlines the assumptions for the strategic cost estimates for proposed infrastructure. The analysis has been undertaken based on mapping walking and bicycle catchments from schools and local / major centres, identifying barriers and opportunities for walking and bike riding, identifying walking and bicycle riding routes and desire lines and a review of on-site conditions.

The method for prioritising proposed walking and bicycle riding routes and infrastructure is also provided in this section.

10.1 Design networks of continuous, convenient connections

The pedestrian and bicycle networks have been developed for *AT-Strathfield* through consideration of the following:

- Guidance provided from the NSW Government;
- Walking and bike riding catchments from schools and local centres;
- Reviewing crash data involving pedestrians and bike riders;
- Reviewing traffic conditions from site inspections and traffic count data;
- Identifying barriers and opportunities for walking and bike riding in Strathfield;
- Identifying direct routes, which would provide convenient connections between residential, education, employment and recreational land uses;
- Development of standard details for pedestrian and bicycle infrastructure that Council can implement to encourage an increase in walking and bike riding as a mode of transport for local trips; and
- Prioritising works for Council to implement the new walking and bike-riding infrastructure.

10.2 Catchment Maps

Walking and bike riding catchment plans have been developed to identify walkable and ridable catchments from key trip attractors/generators in the Strathfield LGA, including schools and local centres. These catchment maps have been used along with other information to develop walking and bike riding networks for *AT-Strathfield*.

Walking and Bike Riding Catchments for Schools

Figure 10-1 shows walking catchments from schools within the Strathfield LGA. These catchments have been established based on the following:

- Five minute, ten minute and 20 minute walking catchments from schools at a child walking speed of 4 km/h.

Figure 10-1 shows that the whole of Strathfield LGA is within a 20 minute radii distance from a school. Many residential areas also within an easy 10 minute walk of a school.

Figure 10-1 5 Minute, 10 Minute and 20 Minute Walking Catchment - Schools

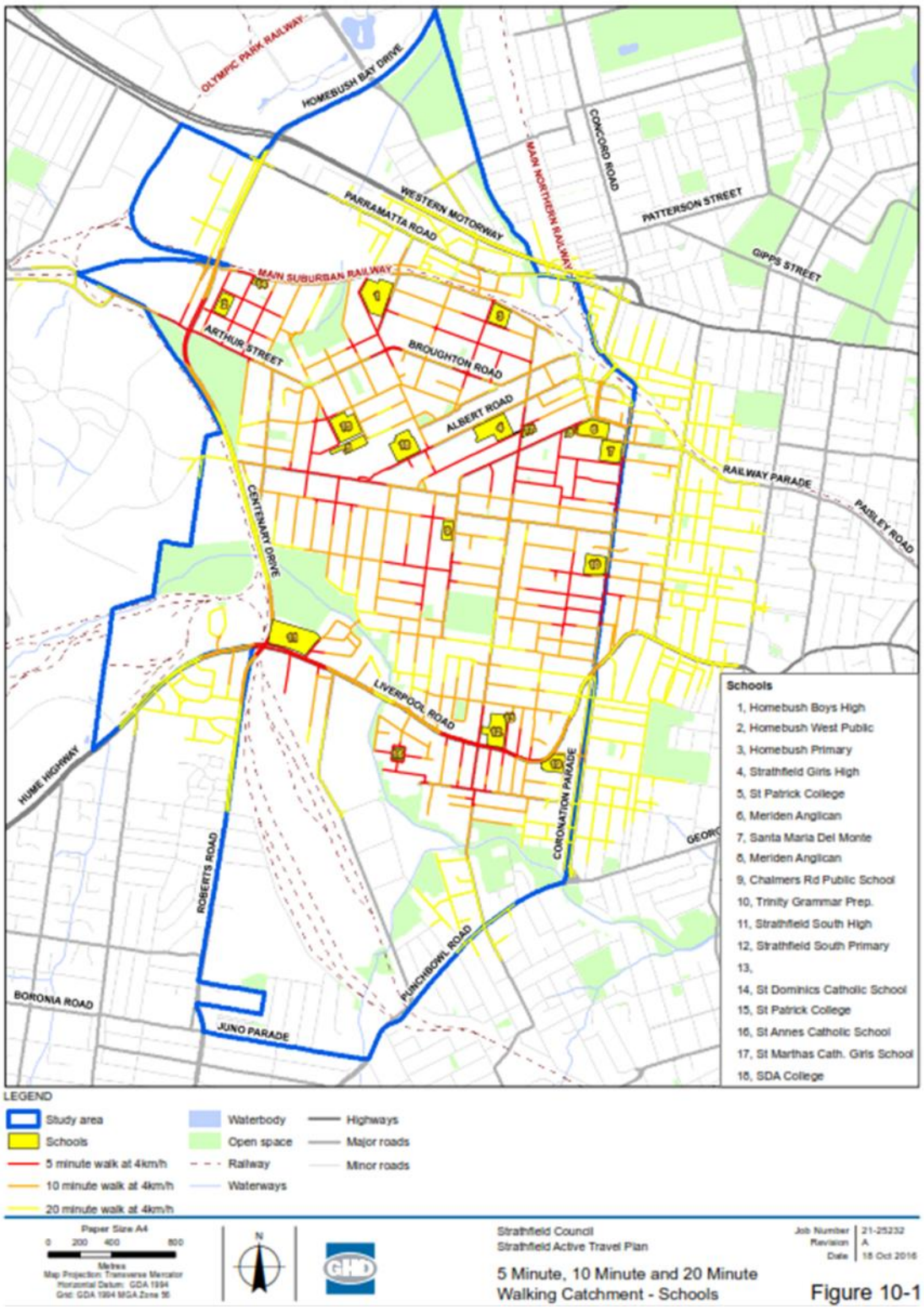
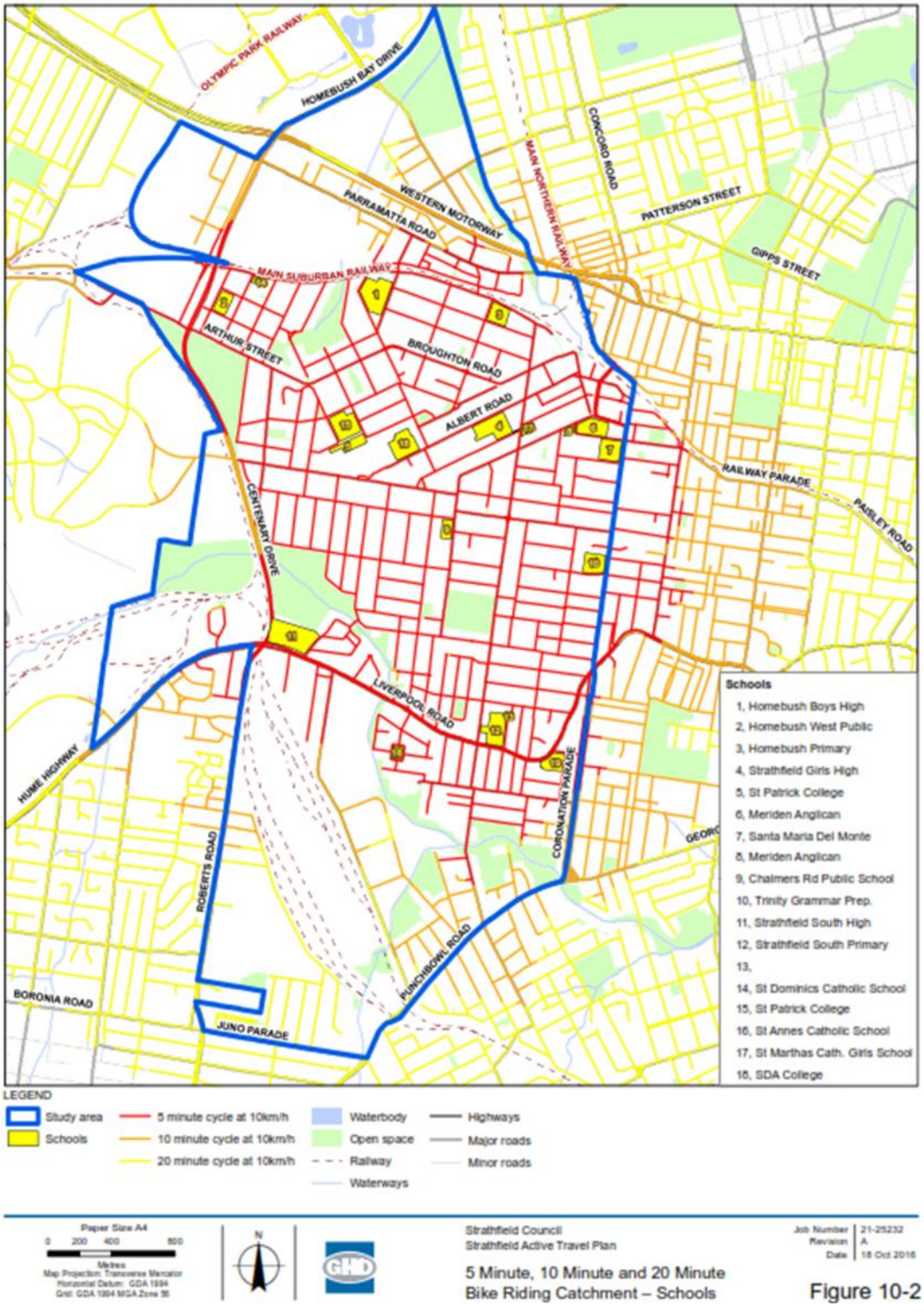


Figure 10-2 shows bike riding catchments for primary schools, high schools and TAFE campus. These catchments have been developed based on the following:

- Five, ten and 20-minute bike riding catchments from schools at a child bike riding average speed of 6 km/h.

Figure 10-2 shows that the whole of the Strathfield LGA is within a 20 minute bike riding distance from a school, with most residential areas also within an easy, ten minute ride of a school.

Figure 10-2 5 Minute, 10 Minute and 20 Minute Bike Riding Catchment – Schools



Walking and Bike Riding Catchments for Local Centres

Figure 10-3 shows walking catchments for local centre, based on the following:

- Five minute, ten minute and 20-minute walking catchments, based on a leisurely walking speed of 4 km/h.

Figure 10-3 indicates that the majority of the Strathfield LGA is within a 20 minute walking distance from a local centre, with many residential areas also within an easy 10 minute walk of a of a local centre.

Figure 10-3 5 Minute, 10 Minute and 20 Minute Walking Catchment – Local Centres

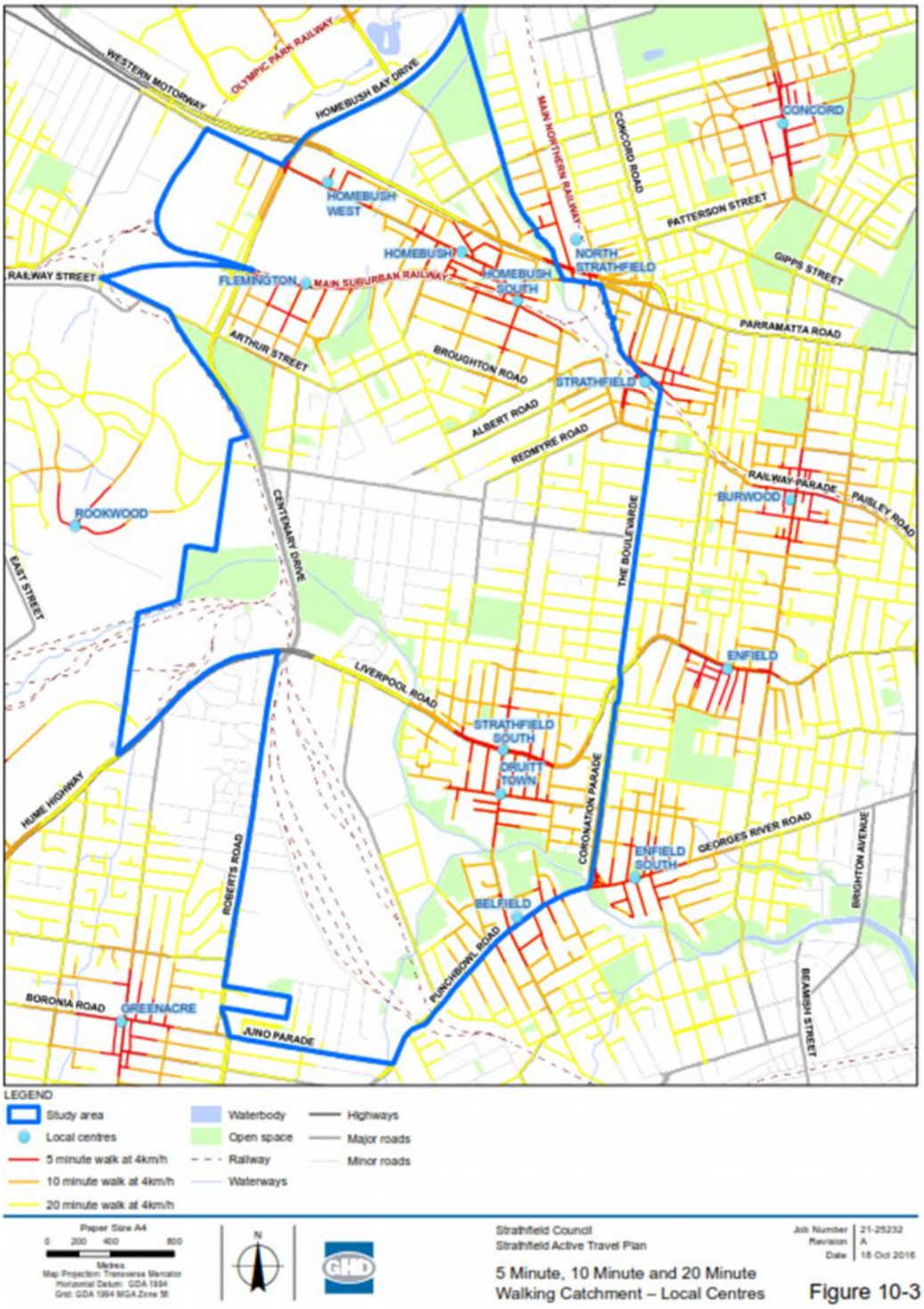
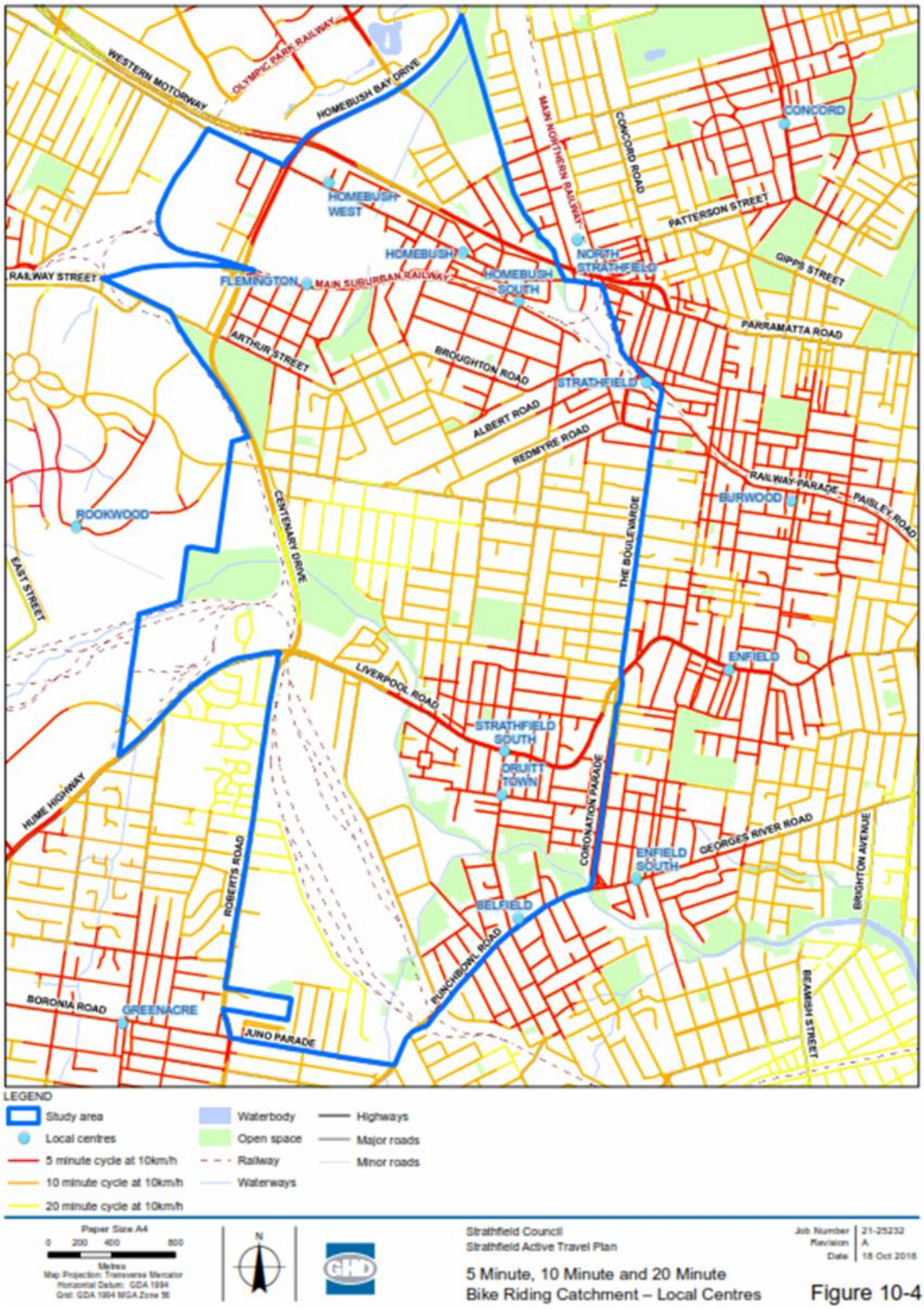


Figure 10-4 shows bike riding catchments from local centres, based on the following:

- Five minute, ten minute and 20-minute bicycle riding catchments based on a leisurely walking speed of 10 km/h.

Figure 10-4 indicates all of Strathfield LGA is within a 20 minute bike riding distance from a local centre, with many residential areas also within an easy 10 minute ride of a of a local centre.

Figure 10-4 5 Minute, 10 Minute and 20 Minute Bike Riding Catchment – Local Centres



Extended Bicycle Riding Catchment Plans

The NSW Government's *Sydney's Cycling Future* report identifies a number of major centres that should be connected via a strategic bicycle network. It states that investments for bicycle facilities will be prioritised within five kilometre catchments of major centres, extending to 10 km in longer term The major centres identified in *Sydney's Cycling Future* the in the vicinity of the Strathfield LGA include:

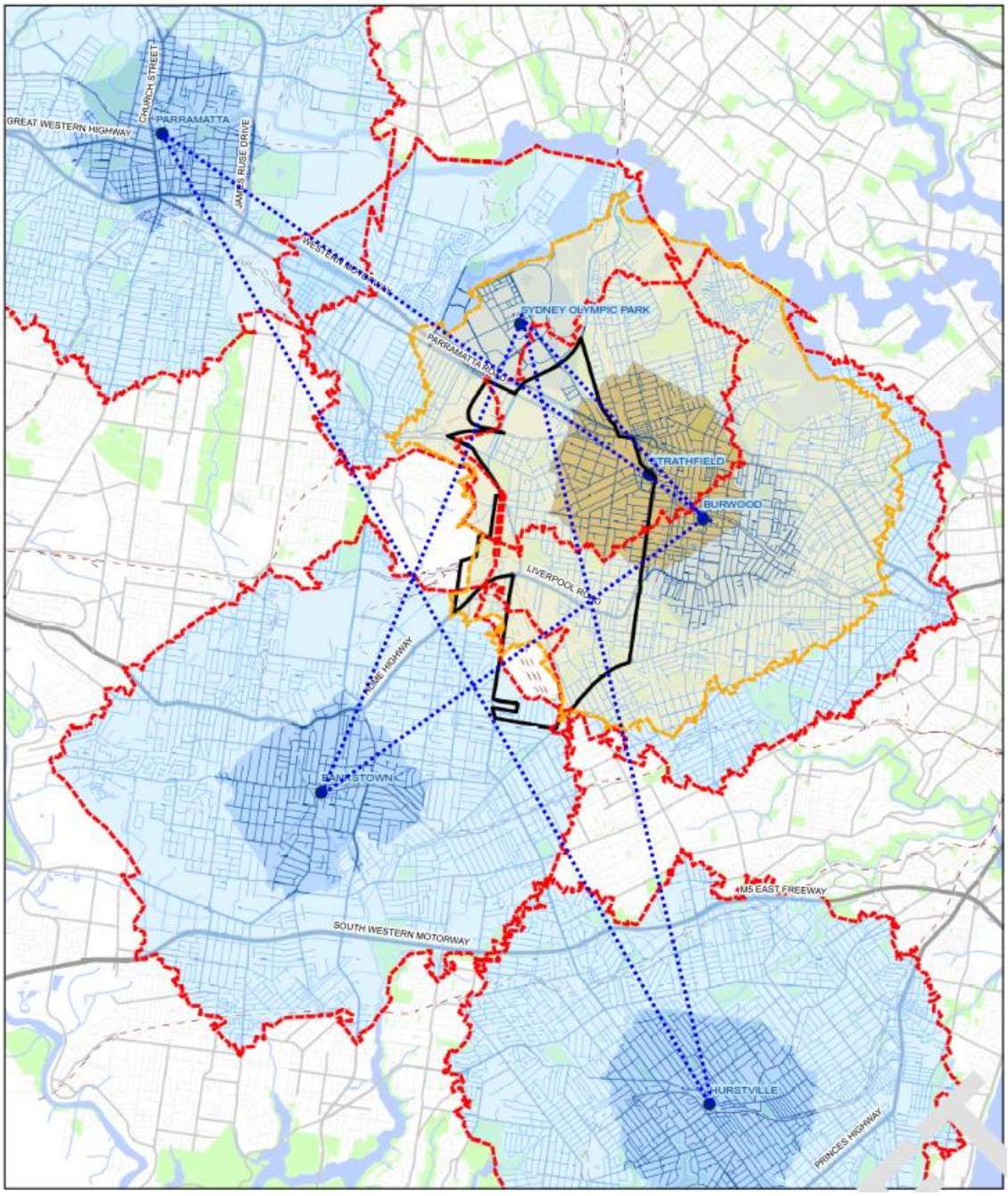
- Burwood;
- Parramatta;
- Bankstown; and
- Sydney Olympic Park and Rhodes.

Consultation with Roads and Maritime, TfNSW and Strathfield Council identified that there is an opportunity to provide strategic bicycle network connections between these major centres through the Strathfield LGA. Catchment maps of the surrounding major centres have been developed to examine where these bike catchments overlap with the Strathfield LGA and the bike catchment for Strathfield Centre.

The five km bicycle catchments for the major centres surrounding the Strathfield LGA are shown at Figure 10-5. In order to develop potential routes for the proposed strategic bicycle routes, "as the crow flies" desire lines for bike riders have been included in the catchment map in order to identify locations where the strategic routes could link into the Strathfield network. This was used as the basis for establishing strategic bicycle routes through the Strathfield LGA.

TfNSW identified that fully separated cycleways are preferred for the strategic bicycle routes.

Figure 10-5 5 km Bicycle Catchments – Major Centres



10.2.1 Barriers to walking and bike riding

Strathfield has a unique character that creates barriers to active transport. At the outset of the project, the goal of making Strathfield accessible for walking and bike riding required a close examination of the following characteristics:

- Network connectivity;
- Street width and character;
- Street speeds;
- Safety perceptions; and
- Traffic volumes.

Network Connectivity

A key perception barrier to bicycle riding is missing links within bicycle networks. If a bike rider rides along a safer section of dedicated facility (bike path, lane etc.) and it ends and “dumps” them in a high traffic or high speed environment, it can result in them not being willing to complete the trip or undertake the trip again.

To support bicycle riding in the Strathfield LGA, a connected bicycle network has been developed to support easy implementation and a consistent approach across the LGA.

Street Width and Character

Strathfield has a varying street width, with parallel parking provided along most streets. The proposed facilities have been designed to minimise any changes to the street character while improving conditions for bike riding.

Street Speeds

Lower roads speeds could be introduced at some roads to improve safety and enable pedestrians and bike riders to feel safe for walking and bike riding. Narrowing the marked lanes without changing parking or traffic capacity can reduce speeds by making the environment *feel* like it is narrower, slowing drivers.

Many of the local roads within the Strathfield LGA have signposted speed limits of 50 km/h which is not suitable for bicycle riding without separation from traffic. A lower, residential speed limit of 30 or 40 km/h is required to support bicycle riding within the traffic network. Even at these speeds, many inexperienced riders will still feel uncomfortable due to the potential for crashes (car doors and turning vehicles).

Safety Perceptions

Roundabouts form a barrier to non-confident bicycle riders. By reducing the size of some roundabouts, speeds can be lowered and safer treatments for walkers and bicycle riders developed. Roundabouts are not preferred in areas of high walking and bicycle riding.

Traffic Volumes

Busy roads with high traffic volumes can be unattractive for bicycle riders. Bicycle routes should generally avoid busy roads, unless additional bike infrastructure can be provided to improve safety and comfort for bike riders through separation.

The roads within the highest traffic volumes include:

- Parramatta Road with around 33,250 vehicles per day;
- Liverpool Road with around and 51,370 vehicles per day;
- Centenary Drive with around and 91,950 vehicles per day; and
- The Boulevarde with around and 22,150 vehicles per day.

No traffic data for other local roads within the study area was available for this study. However, observations during the site inspections and saddle survey identified that many local roads had relatively low traffic volumes, low speeds and heavy vehicle movements. These routes could therefore be suitable for bike riding with minimal additional infrastructure being required.

10.3 Prioritisation Methodology

10.3.1 Bicycle Plan Prioritisation & Methodology

The Roads and Maritime guidelines from *How to Prepare a Bicycle Plan* (2002) indicate that future bicycle routes should be based on a set of priorities, including:

- Safety;
- Community needs and expectations;
- Council commitment;
- Available funding and future planning opportunities; and
- Rectification / maintenance programs.

Overall, this set of priorities is considered to be rather general in nature and does not provide specific guidance on prioritising one route above another. However, specific guidance does exist from the related Roads and Maritime publication *How to Prepare a Pedestrian Access and Mobility Plan* (PAMP) (2002), which can be adopted to suit a prioritisation methodology for bicycle routes.

10.3.2 PAMP Prioritisation & Methodology

As most of the general priorities from the *How to Prepare a Bicycle Plan* (Roads and Maritime, 2002) publication are covered in the PAMP guidelines, *How to Prepare a Pedestrian Access and Mobility Plan* (Roads and Maritime, 2002), GHD has adapted the PAMP Weighted Criteria Scoring System with slight modifications to enable them to be applied in prioritising the proposed bicycle riding improvements.

Scores were derived for each of the recommended improvements for the purpose of prioritising works within the LGA. It should be noted that the prioritisation of works presented in this plan is intended to support decision making, not replace decision making.

Prioritisation of the proposed routes is based on a slight modification to the Weighted Criteria Scoring System.

10.4 Route Prioritisation

A hierarchy of routes has been developed for the provision of walking and bike riding infrastructure for along the primary and secondary routes. The hierarchy has been developed based on a prioritisation scoring tool, shown at .

Each “Criteria” shown at was scored high, medium or low based on the following scoring:

- High = 3
- Medium = 2
- Low = 1

The scores for each Criteria were then ranked based on the weighting for each Category, as shown in Table 10-1.

Table 10-1 Prioritisation of Works Scoring Tool

Category	Weighting	Criteria
Land Use	20%	Proximity to Attractors / Generators
		Future Development with Attractors / Generators
Perception	20%	Road Hierarchy
		Traffic volumes
		Ease of use of existing roads
		Attracts non-regular bicycle riders
		Safety (perception)
Safety	20%	Identified as Hazardous Area (from Site Audit and Consultation)
		Identified Pedestrian/ Bike Rider Crashes
Continuity of Routes	20%	Link existing facilities
		Extension of facilities
		Addition to facilities
User Groups	20%	Children
		Older People
		Shopping
		Social
		Commuting
Total	100%	

10.5 Strategic Cost Estimate Assumptions

This section provides the assumptions on which the following strategic cost estimates have been based, in addition to describing what the strategic costs include for the formalisation of the recommended bicycle routes.

10.5.1 Assumptions

The strategic cost estimates are at a level of detail sufficient to inform and guide Council in securing appropriate funds to take the proposed routes forward to a more detailed level. The strategic cost estimates have been based on guidance from Council in relation to indicative unit rates, and would be subject to further refinement at a later stage.

No unit costs for active transport infrastructure was provided by Strathfield Council for this study. The following assumptions were made as part of the strategic cost estimation process:

- No allowance has been made for any property acquisition;
- No allowance for contingencies are included;
- No allowance has been made for any kerbing works as part of the estimates. It has been assumed that where kerbing is required, the works will be undertaken prior to (or in tandem with) footpath works;
- No allowance has been made for implementation of wearing course across partially sealed carriageways where pedestrian crossings are proposed. It has been assumed that where bitumen is required, the works will be undertaken prior to (or in tandem with) footpath and drop kerb works;
- No allowance has been made for labour costs;
- Cycleway lengths have been measured from GIS information provided by Council and as such their accuracy is dependent on the accuracy of the GIS information provided;

- Where parking is currently permitted across existing and/or proposed pram ramps (or drop kerbs) and crossing points, it has been assumed the signage will be adjusted to ensure these areas are no standing zones. However, there has been no allowance for these works in the estimates;
- No allowance for tactile paving has been included;
- No allowance has been made for pathway lighting;
- Shared paths have been costed as being constructed with concrete, where appropriate; and
- On-road bicycle path costs have been costed based upon line markings on-road shoulders. The costs do not include any allowance for construction of new shoulders for bicycle paths. Many shoulders and streets are very rough and not necessarily suitable for bicycles. There may be opportunities to profile and seal a specific narrow section before line marking a bicycle path. The costs associated with these works, however, were excluded from the strategic cost estimates.

The assumed unit costs for active transport infrastructure is summarised in Table 10-2.

Table 10-2 Assumed Unit Cost for Proposed Infrastructure

Facility	Unit Costs Low	Unit Costs High
Separated bicycle path (per m)	$600	$1,500
Roundabout upgrade for separated bicycle path	$90,000	
Shared path (per m)	$250	
Footpaths (per m)	$120	
Bike lane lines (per m)	$70	
Green cycleway paint at intersection crossings (per m) - assumed 10% of bike route	$175	
Signage (number of signs) - assumed every 500 m along route	$350	
Arrows (on road symbols) - assumed every 400 m along route	$40	
Bike symbols (on road symbols) - assumed every 100 m along route	$30	
Bike / pedestrian refuge	$50,000	
Midblock signal crossing	$1,000,000	
Shared Crossing Lanterns (each)	$5,000	
Signal Plan Upgrade	$150,000	$500,000
Kerb ramps (each)	$900	
Bike parking (per rack)	$200	

10.5.2 Cost Inclusions

For comparison purposes, a low-end and a high-end unit cost have been developed and used in the strategic cost estimates for separated bicycle paths and signal plan upgrades. These ranges in costs reflect relative construction difficulties and the inclusion of additional infrastructure components for the different cycle facility types. The infrastructure components included in the low-end and high-end cost estimates are described further below.

On Road Mixed Traffic Routes

For on-road mixed traffic routes, the low-end cost principally incorporates pavement symbols and signage, while the high-end cost allows for additional auxiliary pavement marking which may be required.

On Road Cycle Path Routes

For on-road cycle paths, the low-end cost principally incorporates line-marking, pavement symbols and signage, while the high-end cost allows for additional pavement surface upgrade works on the road shoulders.

Off Road Cycle Path or Shared Path Routes

For off-road cycle paths, the low-end cost principally incorporates concrete surfacing, line-marking, pavement symbols and signage, while the high-end cost allows for a wider path width with greater provision of line-marking, pavement symbols and signage.

PART B – AT Strathfield

11. Introduction

Based on the information outlined in Part a of *AT-Strathfield*, Part B identifies proposed walking and bicycle improvements, including proposed networks and infrastructure. The walking and bicycle routes and proposed infrastructure have been costed and prioritised to provide direction to Council on how to deliver the proposed initiatives developed as part of *AT-Strathfield*.

Part B is structured as follows:

- **Section 12 Proposed Improvements** - provides details of the proposed improvements to pedestrian and bicycle facilities;
- **Section 13 Prioritisation and Funding** - prioritises the identified works and investigates funding sources for pedestrian and bicycle improvements;
- **Section 14 Supporting a Culture of Active Transport –** provides recommended walking bicycle riding promotion and behaviour change programmes to encourage walking and riding in Strathfield;
- **Section 15 Evaluating Success -** describes how the success of the Plan can be evaluated;
- **Section 16 Additional Considerations** - outlines further considerations for bicycle users, such as maintenance, potential monitoring criteria, bicycle parking and other measures to increase walking and bicycle use in Strathfield; and
- **Section 17 Summary** - provides a short summary of *AT-Strathfield*.

12. Proposed Improvements

Based on the findings of the background and investigations provided in Part A, this section identified the proposed walking and bicycle riding networks and infrastructure improvements. These recommendations have been developed through an iterative process between GHD, Council, stakeholders and the community.

12.1 Proposed Bicycle Routes for Strathfield

A map showing the proposed bicycle network is shown at Figure 12-1, with a description of each route provided at Table 12-1.

The Daytime Network, which is labelled as “D1” in , consist of the Cooks River Cycleway. This has been identified as a daytime route as there is limited street lighting and passive surveillance along this route.

There are also a number of connector routes shown as “C1, C2, C3” etc. These connector routes are short links in the bike network between other bicycle routes.

Figure 12-1 Proposed Bicycle Network

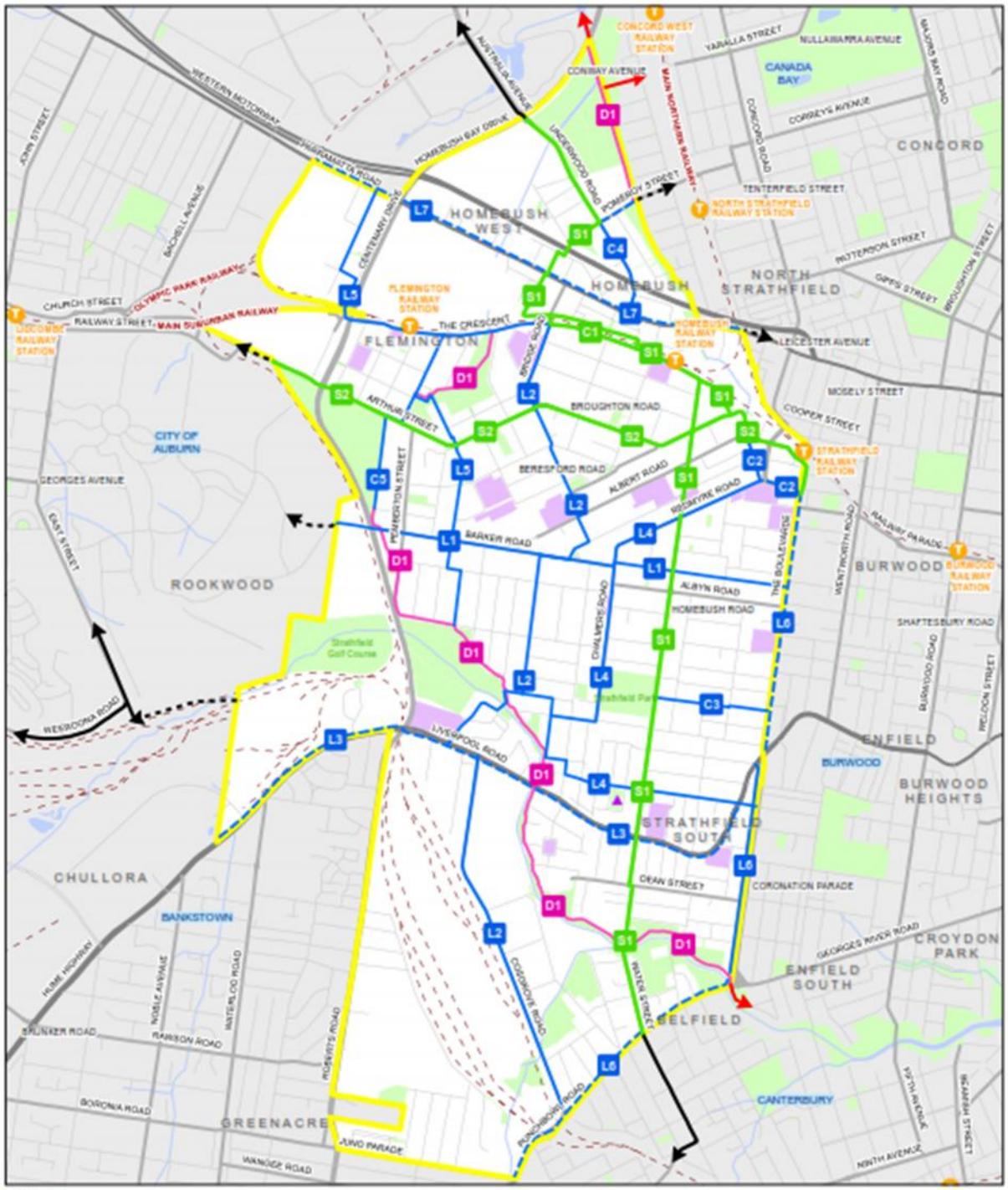


Table 12-1 Proposed Bicycle Improvements

Route Name	Bicycle Route Type	Route Description	Infrastructure Upgrades	Potential Funding Source	Length (m)	Low Cost	High Cost
S1	Separated bicycle path	Hurstville to Olympic Park Sydney Bicycle riding Future Route - via Water Street, Homebush Road, The Crescent, Subway Lane and Loftus Lane, Loftus Crescent, Smallwood Avenue, Derowie Avenue, Pomeroy Street, Underwood Road.	Separated bicycle path	Roads and Maritime	6,850	$4,110,000	$10,275,000
			Upgrade traffic signals for bicycles at Punchbowl Road/Water Street intersection	Roads and Maritime		$190,000	$540,000
			Upgrade traffic signals for bicycles at Homebush Road/Water Street intersection	Roads and Maritime		$170,000	$520,000
			Upgrade traffic signals for bicycles at Homebush Road/Liverpool Road intersection	Roads and Maritime		$190,000	$540,000
			Roundabout upgrade for separated bicycle path at Homebush Road/Albyn Road intersection	Roads and Maritime		$90,000	
			Upgrade traffic signals for bicycles at Homebush Road/Redmyre Road intersection	Roads and Maritime		$190,000	$540,000
			Roundabout upgrade for separated bicycle path at Homebush Road/Albert Road intersection	Roads and Maritime		$90,000	
			Roundabout upgrade for separated bicycle path at Homebush Road/The Crescent intersection	Roads and Maritime		$90,000	
			Roundabout upgrade for separated bicycle path at The Crescent/Subway Lane intersection	Roads and Maritime		$90,000	
			Roundabout upgrade for separated bicycle path at Subway Lane/Loftus Crescent intersection	Roads and Maritime		$90,000	
			Upgrade traffic signals for bicycles at Pomeroy/Underwood intersection	Roads and Maritime		$190,000	$540,000

Route Name	Bicycle Route Type	Route Description	Infrastructure Upgrades	Potential Funding Source	Length (m)	Low Cost	High Cost
			Upgrade traffic signals for bicycles at Underwood Road/Australia Avenue/Homebush Bay Drive ramps intersection	Roads and Maritime		$190,000	$540,000
			Convert footpath between Elva Street and The Crescent to shared path and provide kerb ramps.	Roads and Maritime	140	$36,800	
			New midblock pedestrian / bicycle crossing on Parramatta Road at Smallwood Avenue/Derowie Avenue intersection.	Roads and Maritime		$1,000,000	
S2	Separated bicycle path	Burwood to Parramatta - via The Boulevarde Broughton, Albert Road, Elva Street, Beresford Road, Broughton Road, Arthur Street.	Separated bicycle path	Roads and Maritime	3,670	$2,202,000	$5,505,000
			Upgrade traffic signals for bicycles at The Boulevarde/Parnell Street intersection	Roads and Maritime		$190,000	$540,000
			Upgrade traffic signals for bicycles at The Boulevarde/Redmyre Road intersection	Roads and Maritime		$190,000	$540,000
			Upgrade traffic signals for bicycles at Raw Square/Albert Road intersection	Roads and Maritime		$190,000	$540,000
			Upgrade traffic signals for bicycles at Beresford Road/Homebush Road intersection	Roads and Maritime		$190,000	$540,000
			Roundabout upgrade for separated bicycle path at Broughton Road/Rochester Street intersection	Roads and Maritime		$90,000	
			Roundabout upgrade for separated bicycle path at Broughton Road/Meredith Street intersection	Roads and Maritime		$90,000	
			Roundabout upgrade for separated bicycle path at Broughton Road/MacKenzie Street intersection	Roads and Maritime		$90,000	

Route Name	Bicycle Route Type	Route Description	Infrastructure Upgrades	Potential Funding Source	Length (m)	Low Cost	High Cost
			Roundabout upgrade for separated bicycle path at Arthur Street/Pemberton Street intersection	Roads and Maritime		$90,000	
			Upgrade traffic signals for bicycles at Centenary Drive/Arthur Street intersection	Roads and Maritime		$190,000	$540,000
L1	On road	Woodward Avenue, Elwin Street, Barker Road, Weeroona Road.	On road bike lanes	Council	2,650	$469,567	
			New bike refuge crossing at The Boulevard New Woodward Avenue	Council		$50,000	
L2	On road	Cosgrove Road, Liverpool Road, Hedges Avenue, Augusta Street, Glenarvon Street, South Street, Barker Road, Oxford Road, Heye Avenue, Albert Road, Dickson Street, Mackenzie Street, Bridge Road.	On road bike lanes	Council	5,990	$1,061,398	
			Bike lanterns at Cosgrove Road/Liverpool Road intersection	Roads and Maritime		$30,000	
L3	Shared path	Liverpool Road	On road bike lanes	Council	3,610	$639,674	
			Bike lanterns at Liverpool Road Centenary Drive intersection	Roads and Maritime / Council		$40,000	
L4	On road	Plymouth Street, High Street, Wallis Avenue, Verona Street, Palmer Avenue, Augusta Street, Chalmers Road, Redmyre Road.	On road bike lanes	Council	4,040	$715,868	
L5	On road	South Street, Barker Road, Oxford Road, Heyde Avenue, Albert Road, Dickson Street, Mackenzie Street, Bridge Road	On road bike lanes	Council	3,400	$602,463	
			New bicycle refuge crossing at Hampstead Road/Arthur Street	Council		$50,000	
			New bike crossing refuge at Fraser Street / Arthur Street intersection	Council		$50,000	

Route Name	Bicycle Route Type	Route Description	Infrastructure Upgrades	Potential Funding Source	Length (m)	Low Cost	High Cost
			Upgrade footpath to shared path at Fraser Street to north and south of Arthur Street	Council	50	$12,500	
L6	Shared path	The Boulevarde	Shared path	Council (Burwood/Strathfield)	3,270	$817,500	
			Bike lanterns at The Boulevarde/Liverpool Road intersection.	Roads and Maritime / Council		$40,000	
	On road	Coronation Parade	On road bike lanes	Council	1,200	$212,634	
L7	Shared path	Parramatta Road	Shared path	Roads and Maritime / Council	2,700	$675,000	
			Bike lanterns at Parramatta Road/Centenary Drive intersection	Roads and Maritime / Council		$40,000	
			Bike lanterns at Parramatta Road/Potts Street intersection	Roads and Maritime / Council		$20,000	
			Bike lanterns at Parramatta Road/Bridge Road intersection	Roads and Maritime / Council		$20,000	
			Bike lanterns at Parramatta Road/Park Road intersection	Roads and Maritime / Council		$20,000	
			Bike lanterns at Parramatta Road/Underwood Road intersection	Roads and Maritime / Council		$20,000	
			Bike lanterns at Parramatta Road/Knight Street intersection	Roads and Maritime / Council		$20,000	
			Bike lanterns at Parramatta Road/George Street intersection	Roads and Maritime / Council		$20,000	
D1	Day time Network - Shared Path	Cooks River Cycleway - Barker Road to Punchbowl Road	Shared path connection to Coronation Parade near Punchbowl Road.	Council	50	$12,500	
			Bicycle refuge crossings at Hampstead Road/Arthur Street.	Council		$50,000	
			Widen existing shared path along Bates Street.	Council	105	$26,250	

Route Name	Bicycle Route Type	Route Description	Infrastructure Upgrades	Potential Funding Source	Length (m)	Low Cost	High Cost
C1	Connecter Link - separated bicycle path (optional for S1)	The Crescent and Bridge Road	Separated bicycle path	Council	570	$342,000	$855,000
C2	Connecter Link - on road	Redmyre Road, Elva Street	On road bike lanes	Roads and Maritime / Council	525	$93,027	
			Bike lanterns at Raw Square/Redmyre Road intersection.	Roads and Maritime / Council		$20,000	
			Upgrade footpath to shared path between Redmyre Road and Alva Street	Council	20	$5,000	
C3	Connecter Link - on road	Mount Street, Fairholm Street	On road bike lanes	Council	670	$118,721	
C4	Connecter Link - on road	Underwood Road	On road bike lanes	Council	830	$147,072	
C5	Connecter Link - on road	Mitchell Road	On road bike lanes	Council	830	$147,072	

12.2 Proposed Walking Network for Strathfield

Maps showing the proposed primary and secondary walking are provided at Figure 12-2, Figure 12-3 and Figure 12-4 for the northern, central and southern sections of the LGA respectively. These plans also show existing pedestrian crossing facility types. The hierarchy of the primary and secondary routes should be used for implementing future pedestrian facilities.

A high level audit of the primary and secondary walking routes has been undertaken based on site inspections and a review of mapping, using Google Maps and Google Street View (2016). A summary of existing issues and proposed recommended improvements along these walking routes is provided in Table 12-2 for pedestrian crossings and Table 12-3 for footpath works.

However, it should be noted that *AT-Strathfield* is a strategic document. Although some deficiencies in the footpath network and recommended improvements have been provided, it is recommended that Pedestrian Access and Mobility Plans (PAMPs) are developed for the following locations in order of priority.

- PAMP Area 1 – Flemington Station – refer to Figure 12-5;
- PAMP Area 2 – Strathfield Town Centre – refer to Figure 12-6;
- PAMP Area 3 – Homebush Station / Parramatta Road – refer to Figure 12-7; and
- PAMP Area 4 –South Strathfield – refer to Figure 12-8.

The expected costs for developing each PAMP would be around $30,000 to $70,000.

Other key recommended improvements to walking network include:

- Improvements to the pedestrian network at Strathfield Square should be considered as part of urban renewal for the town centre precinct in the vicinity of Strathfield Station and Strathfield Plaza.
- The existing underpass at Memorial Drive / Centenary Drive to the west of Sydney Markets should be closed off to prevent pedestrians from crossing Memorial Drive. An alternative link to Flemington Station from the western side of Memorial Drive is provided to the south, along via the existing DDA compliant access ramps to The Crescent from Memorial Drive, to the south of the railway bridge. This alternative route should be promoted through the provision of wayfinding for pedestrians.

Figure 12-2 Primary and Secondary Routes (northern section of Strathfield LGA)

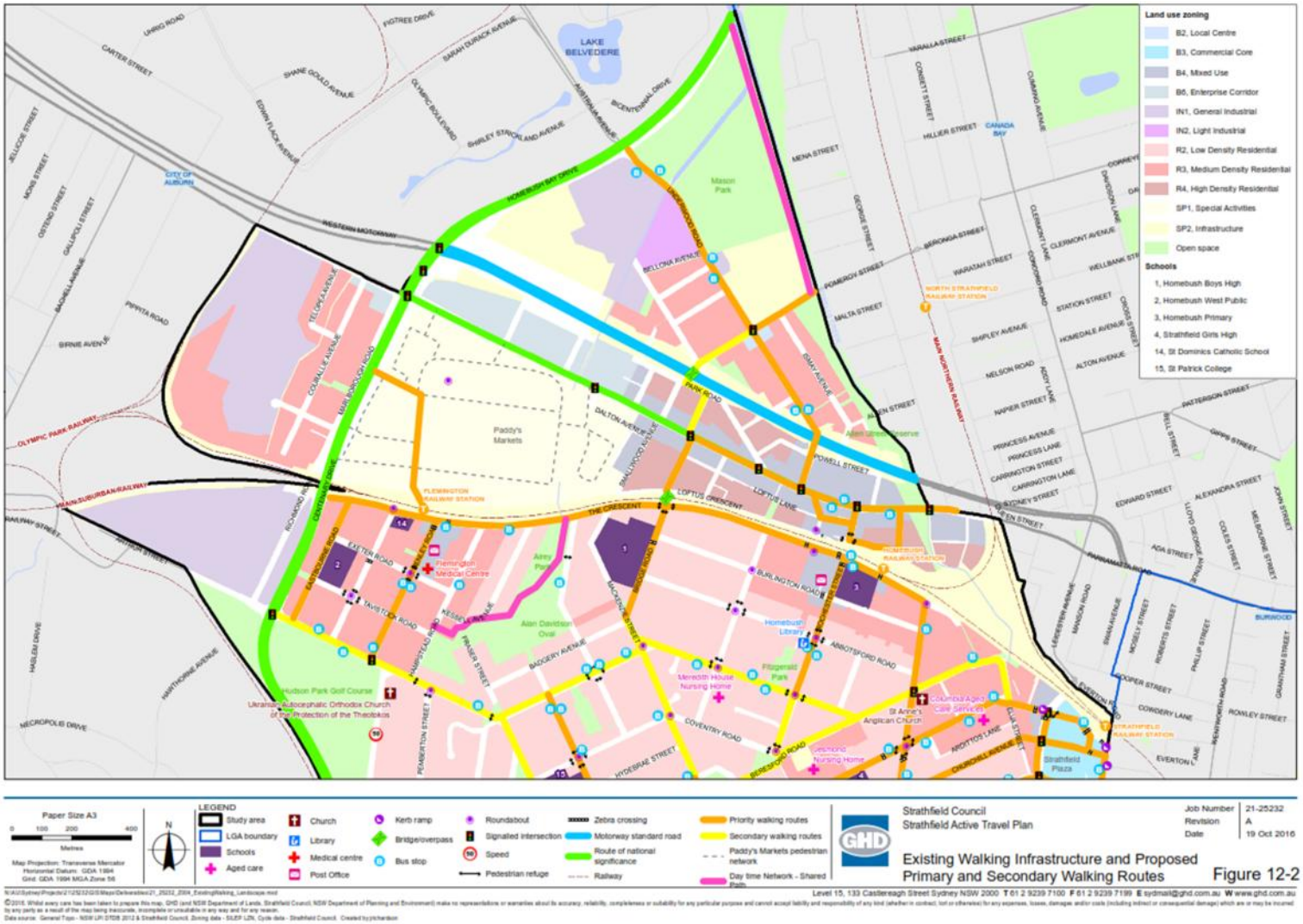


Figure 12-3 Primary and Secondary Routes (central section of Strathfield LGA)

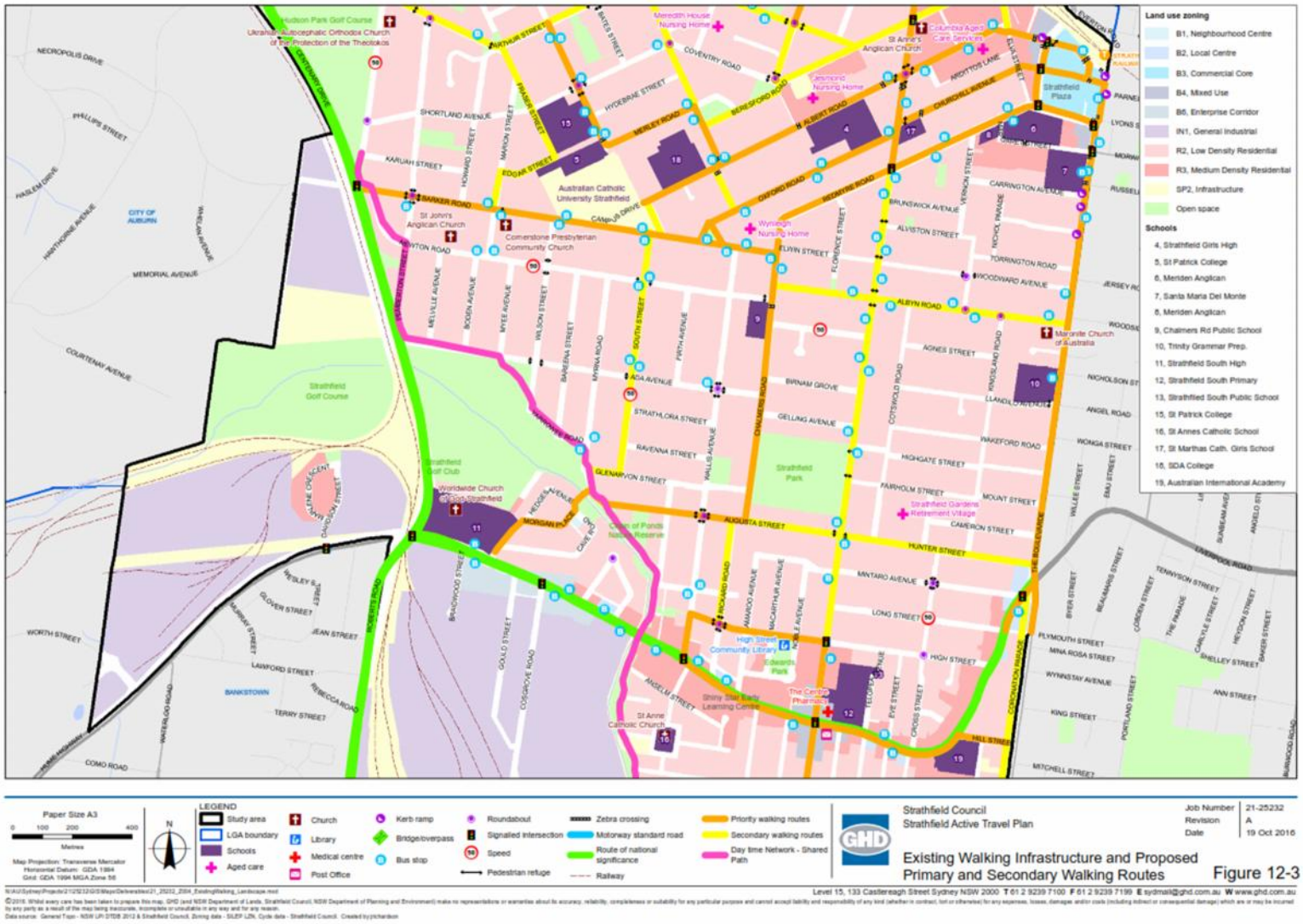


Figure 12-4 Primary and Secondary Routes (southern section of Strathfield LGA)

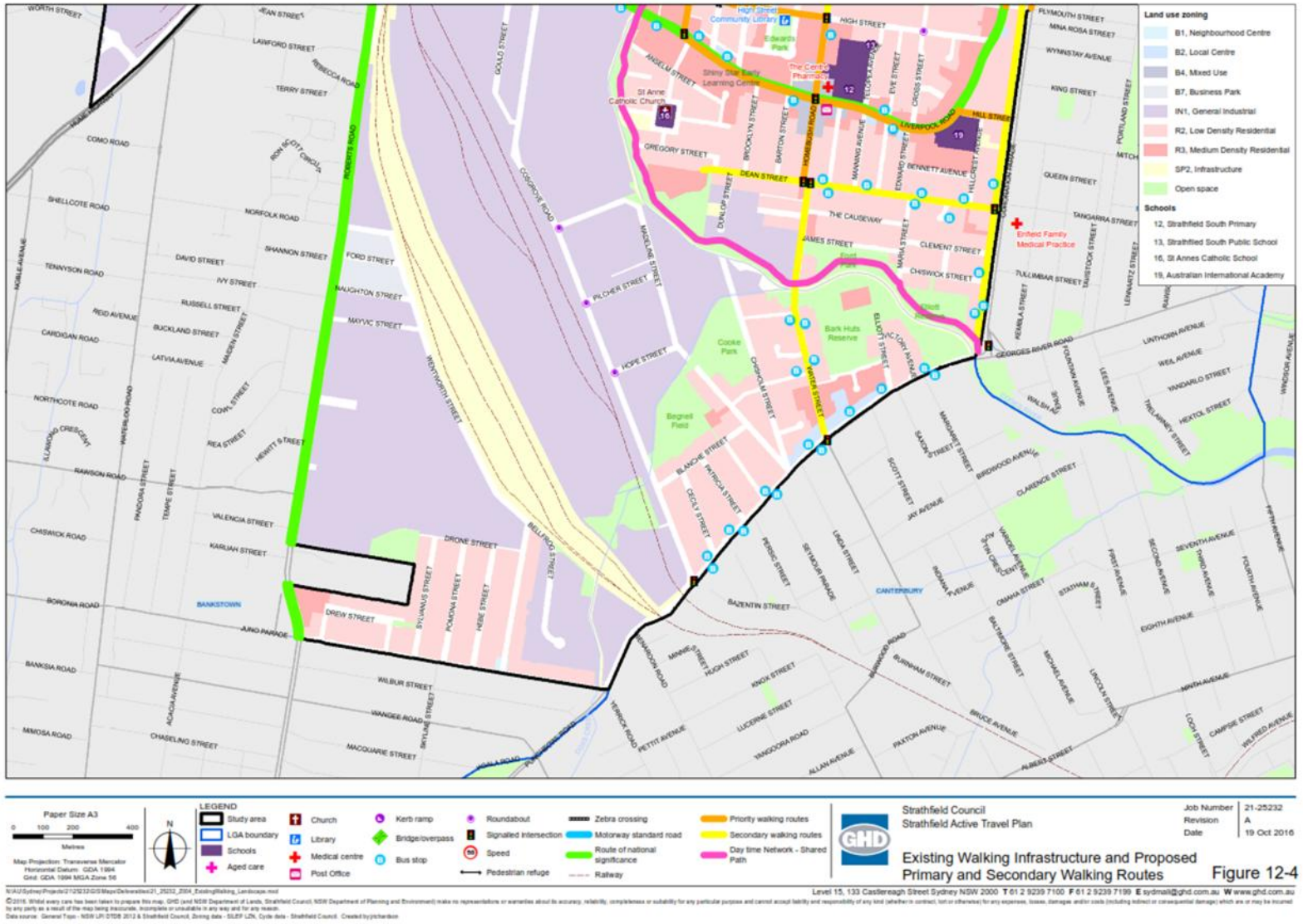


Table 12-2 Proposed Pedestrian Improvements – Pedestrian Infrastructure

Ref	Location	Walking Route Priority	Description	Proposed Improvement	Length (m)	Estimated Cost	Potential Funding Source
1	Loftus Crescent (west approach) / Bridge Road	Priority	No pedestrian crossing provided	New pedestrian refuge		$50,000	Council
2	Bridge Road, south of intersection with Loftus Crescent	Priority	Non-standard refuge crossings	Upgrade pedestrian refuge crossing		$50,000	Council
3	The Crescent / Bridge Street roundabout	Priority	Non-standard and un-aligned refuge crossings	Upgrade pedestrian refuge crossing		$50,000	Council
4	The Crescent, east of Bridge Street roundabout	Priority	Non-standard refuge crossings	Upgrade pedestrian refuge crossing		$50,000	Council
5	Station Street, north of Homebush Station	Priority	No standard pedestrian crossing provided to train station access and bus stop from footpath on opposite side	New pedestrian refuge		$50,000	Council
6	Hampstead Road / The crescent	Priority	No standard pedestrian crossing provided at wide crossing point	New pedestrian refuge		$50,000	Council
7	Kessell Avenue / The Crescent	Priority	No standard pedestrian crossing provided at wide crossing point	Upgrade pedestrian refuge crossing		$50,000	Council
8	Bates Street	Priority	No kerb ramps to facilitate crossing at pedestrian refuge	Install kerb ramps		$1,800	Council
9	Burlington Road / Rochester Street (adjacent to Homebush Public School)	Priority	No standard pedestrian crossing facilities provided at wide crossing point	New pedestrian refuge		$50,000	Council
10	The Crescent (east of Homebush Railway Station)	Priority	Narrow footpath, with telegraph poles which limits space for pedestrians.	Widen footpath.	40	$4,800	Council
11	Homebush Road south approach to intersection with The Crescent	Priority	Narrow pedestrian refuge with no yellow safety bollards	Upgrade pedestrian refuge crossing		$50,000	Council

Ref	Location	Walking Route Priority	Description	Proposed Improvement	Length (m)	Estimated Cost	Potential Funding Source
12	Dickson Street / Albert Road	Priority	Kerb ramp at intersection is not of adequate width compared to the available pedestrian crossing	Upgrade kerb ramps		$1,800	Council
13	Chalmers Road / Barker Road	Priority	Pedestrian refuge at intersection is in poor condition. Pedestrian walk route does not align with kerb ramp on southern side of Barker Road	Upgrade pedestrian refuge crossing		$50,000	Council
14	Newton Road, adjacent to Chalmers Road	Priority	No standard pedestrian crossing provided across wide street adjacent to education facility	New pedestrian refuge		$50,000	Council
15	Palmer Avenue / Augusta Street	Priority	No kerb ramps provided on intersection approaches	Provide new kerb ramps (x6)		$5,400	Council
16	Morgan Place / Hedges Avenue	Priority	No pedestrian crossing facility is provided across wide street	New pedestrian refuge		$50,000	Council
17	Morgan Place	Priority	No kerb ramp provided	Provide new kerb ramp		$900	Council
18	Barker Road / Howard Street	Priority	Island is not pedestrian friendly with no kerb ramps for pedestrians to mount	Upgrade pedestrian refuge crossing		$50,000	Council
19	Broughton Road	Secondary	Non-standard pedestrian crossing refuge with no signage	Upgrade pedestrian blisters / crossing		$50,000	Council
20	Broughton Road / Rochester Street	Secondary	Painted island, with no physical refuge island as on other approaches to this intersection	New pedestrian refuge		$50,000	Council
21	Arthur Street	Secondary	Poor quality pedestrian refuge	Upgrade pedestrian refuge crossing		$50,000	Council
22	Fraser Street near Arthur Street	Secondary	No crossing to provide link from Arthur Street to Fraser Street	New pedestrian refuge		$50,000	Council
23	South Street / Strathlora Street	Secondary	Kerb ramp poorly located as it does not provide direct link to adjacent kerb ramp	Upgrade kerb ramps (x2)		$1,800	Council
24	Hunter Street / Cotswald Road	Secondary	No kerb ramps provided on either side of Cotswald Road crossing.	Upgrade kerb ramps (x2)		$1,800	Council

Ref	Location	Walking Route Priority	Description	Proposed Improvement	Length (m)	Estimated Cost	Potential Funding Source
			Poor quality footpath is also an issue / trip hazard				
25	Hunter Street / Cross Street	Secondary	No kerb ramp provided on western side of intersection to facilitate pedestrian access.	Upgrade kerb ramps (x2)		$1,800	Council
27	Strathfield Town Centre	Priority	Poor pedestrian environment in Strathfield Square adjacent to station entrance.	Urban renewal of town centre		$2,000,000	Council / Roads and Maritime

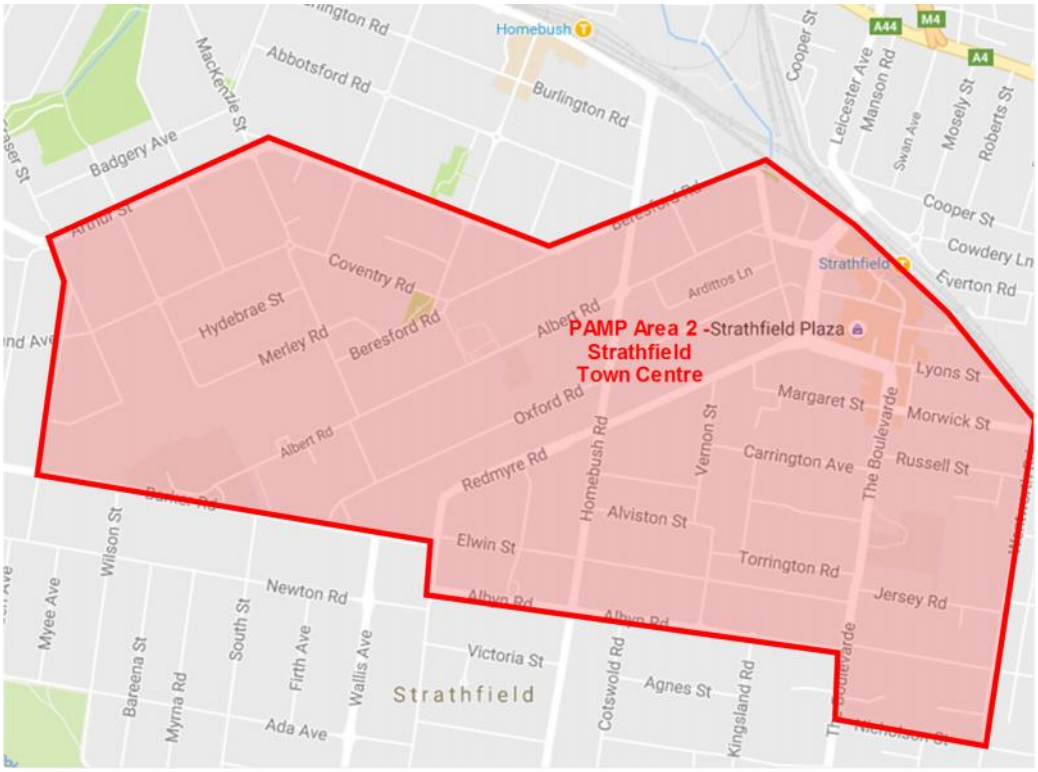
Table 12-3 Proposed Pedestrian Improvements – Footpath Works

Street	Side of Street	Location	Walking Route Priority	Proposed Infrastructure	Length (m)	Cost Estimate
Underwood Road	South	Homebush Bay Drive to Powell Street	Priority	Footpath Upgrade	1,000	$120,000
Underwood Road	North	Homebush Bay Drive to Powell Street	Priority	Footpath Upgrade	750	$90,000
Parramatta Road	South	Bridge Road to Columbia Lane	Priority	Footpath Upgrade	950	$114,000
Merley Road	Northwest	East of St Patrick's College	Priority	Footpath	300	$36,000
Merley Road	Southeast	East of St Patrick's College	Priority	Footpath	130	$15,600
Oxford Road	Southeast	North of Wynleigh Nursing Home	Priority	Footpath	180	$21,600
Homebush Road	East	North of Strathfield Park	Secondary	Footpath	100	$12,000
Homebush Road	West	North of Liverpool Road	Priority	Footpath	250	$30,000
Henley Road/Arthur Street	Northeast	Henley Road/Arthur Street intersection	Priority	Footpath	50	$6,000
Albyn Road	South	East of Chalmers Road Public School	Secondary	Footpath	150	$18,000
Barker Road	North	East of Howard Street	Priority	Footpath	100	$12,000

Figure 12-5 PAMP Area 1 – Flemington

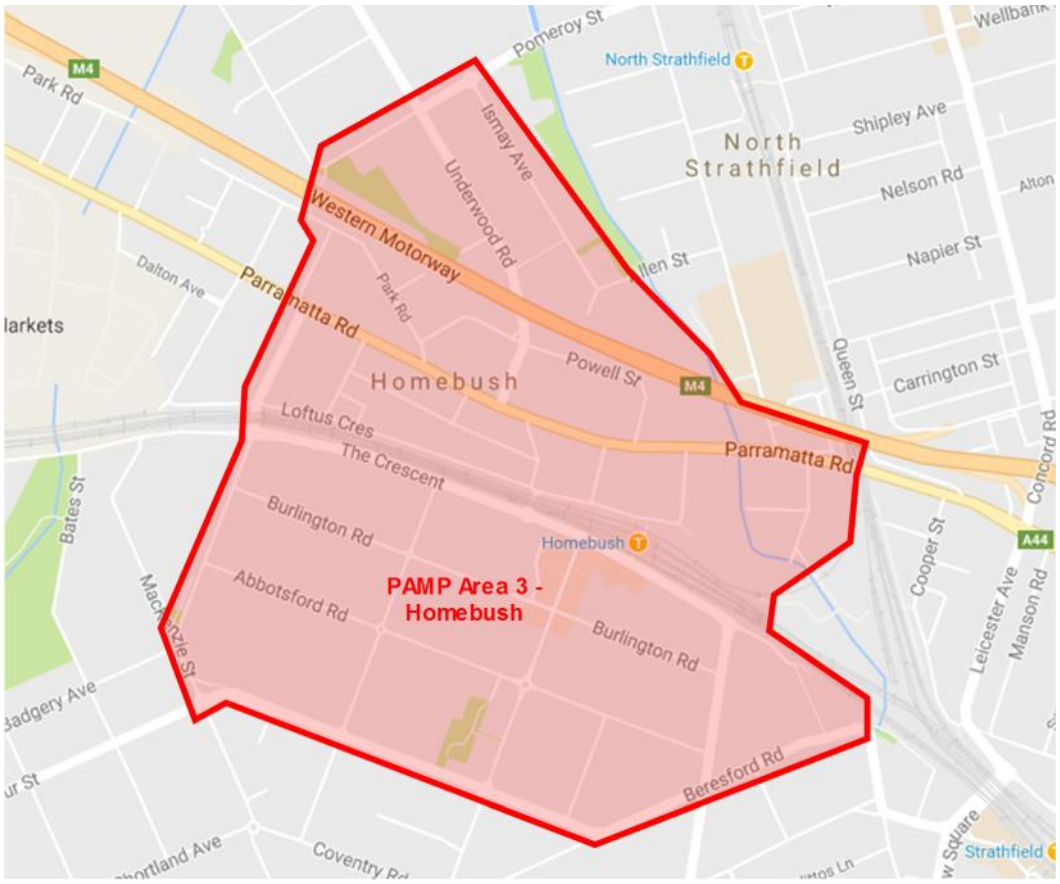
Source: Google Maps (2016), modified by GHD

Figure 12-6 PAMP Area 2 – Strathfield Town Centre



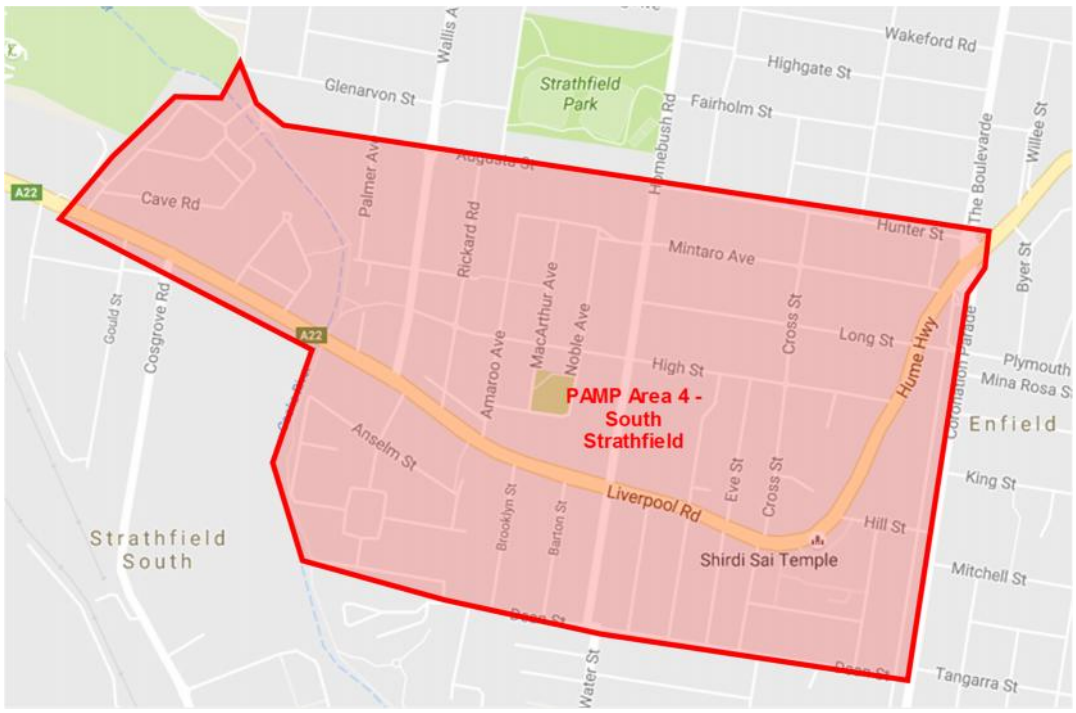
Source: Google Maps (2016), modified by GHD

Figure 12-7 PAMP Area 1 – Homebush and Parramatta Road



Source: Google Maps (2016), modified by GHD

Figure 12-8 PAMP Area 4 – South Strathfield



Source: Google Maps (2016), modified by GHD

12.3 Mid-trip and End-of-tip facilities to encourage use

To encourage and promote walking and bike riding for local trips, the following mid-trip and End-of-tip facilities are proposed along the key walking and bike riding routes:

- For bicycle riding routes:
  - Bicycle parking at key trip attractors/generators; and
  - Water stations every at around every 5 km along bike riding routes.
- For walking routes:
  - Seating around every 250 m along walking routes; and
  - Water stations every at around every 1.5 km along walking routes.

12.3.1 Bicycle Parking

The provision of appropriate bicycle parking facilities will encourage people to ride to their destination. Bicycle parking needs to be safe, secure, convenient and meet the needs of a wide range of bicycle riders. It should ideally be placed in a highly visible location, with good passive surveillance. Two key factors to consider are the type of facility required and the location.

Table 12-4 identifies the most common locations where bicycle parking facilities are required and indicates an appropriate type of bicycle parking facility that should be provided.

Table 12-4 Bicycle Parking Facilities

Location	Appropriate Parking Facility
Shopping centres or business districts.	Individual and small clusters of bicycle parking rails.
Shopping complexes Swimming pools Libraries Markets	Clusters of bicycle parking rails at main entrances.
Work places. Primary and Secondary schools.	Bicycle parking within an enclosure or room close to the pedestrian entrance.
Train stations	Groups of bicycle parking rails within an enclosure.
Apartments or residential complexes	Bicycle parking within an enclosure or room close to the pedestrian entrance.

To ensure the continued use of bicycle parking facilities, they must be maintained. Poorly maintained facilities will have an adverse effect on patronage and the wider use of bicycles as a means of transport. Maintenance costs should also be factored in to ongoing budgeting.

Section 10 of the *Guide to Traffic Engineering Practice, Part 14 – Bicycles* (AUSTROADS, 1999) provides further information on bicycle parking and end-of-trip facilities suitable for low volume parking locations, typically suitable for most main street and trip generating locations.

The *Guide to Traffic Engineering Practice, Part 14* also provides recommendations for the provision of bicycle parking within various land uses. This can be used in Council's DCP to ensure the provision on bicycle parking within new developments in the LGA.

12.3.2 Additional End of Trip Facilities for Bike Riders

In addition to the provision of bicycle parking facilities to encourage and enable bicycle riders to make more journeys by bicycle, additional facilities such as showers, changing rooms and drinking water have been identified as desirable facilities by bicycle riders. Change room and showering facilities have been identified to be required when bicycle riders have travelled greater than 5 km to reach their destination. In addition, lack of showers was identified through the consultation as a barrier to bicycle riding within the LGA.

Provision of a requirement for end of trip shower and change room facilities should be included in Council's DCP to further encouraging bicycle riding as a mode of transport through new development. End of trip change room facilities should also include toilets, basins, mirrors and lockers.

An additional advantage of providing shower and change room facilities is that they offer benefits to people pursuing other active fitness activities including running and walking.

12.4 Wayfinding Strategy

A Wayfinding Strategy has been developed by Aspect for *AT-Strathfield* and is provided at Appendix E. The Strathfield LGA is within proximity of a number of Sydney's foremost cycle networks, including the Cooks River Path, Sydney Olympic Park and Bicentennial Parkland bike circuits, and the Parramatta Valley Cycleway. Linking the bicycle paths within the LGA is the focus of the Wayfinding Strategy.

On strategic bike paths, network signs have been located at key cycleway points, generally at separated and local / shared network path intersections to navigate cyclists towards town centres and train stations. Trains are the single mode of public transport accessible by bike, thus train stations are used substantially in the strategy.

13. Prioritisation and Funding

13.1 Priority Levels for Walking and Bicycle Riding Improvements

Bicycle Riding Routes

Table 13-1 ranks the proposed bicycle routes for Strathfield based on the modified Weighted Criteria Scoring System. As discussed in Section 10.3, the priorities are based on a slightly modified Roads and Maritime methodology which generally incorporates the key prioritisation criteria.

Walking Networks and Infrastructure

Maps showing the proposed primary and secondary walking are provided at Figure 12-2, Figure 12-3 and Figure 12-4 for the northern, central and southern sections of the LGA respectively.

It is recommended that Pedestrian Access and Mobility Plans (PAMPs) are developed for the following locations in order of priority.

1. PAMP Area 2 – Strathfield Town Centre – refer to Figure 12-6;
2. PAMP Area 1 – Flemington Station – refer to Figure 12-5;
3. PAMP Area 3 – Homebush Station / Parramatta Road – refer to Figure 12-7; and
4. PAMP Area 4 –South Strathfield – refer to Figure 12-8.

The hierarchy of the primary and secondary routes should be used for implementing future pedestrian facilities in areas located outside of the above PAMP areas, as shown at Figure 12-2, Figure 12-3 and Figure 12-4.

13.2 Sources of Funding

13.2.1 Roads and Maritime Funding

A number of funding sources exist through which funding for the provision of walking and bicycle facilities can be obtained, these include:

Roads and Maritime Contributions

Funding from Roads and maritime is available in the following forms:

- 100 percent funding for Strategic Routes that support *Sydney's Cycling Future.*
- RMS grants for 50/50 funding with funding available for:
  - Bicycle Facilities: improvement of existing bicycle facilities;
  - Bicycle User Support: supporting bicycle riding through research, training and promotion;
  - Cycleways: design and construction of on and off-road cycleways which are in line with the NSW Bike Plan and Council's *AT-Strathfield*;
  - Development of PAMPs; and
  - Pedestrian facilities.

Federal and Roads and Maritime Blackspot Funding

There is potential to construct cycle facilities and fund bicycle riding improvements to the road network by providing upgrades at existing intersections being upgraded as part of the Roads

and Maritime Blackspot program, who fund safety improvements at identified blackspots through their own RMS Blackspot Program and the Australian Government Blackspot Program.

13.2.2 Council Funding

Data provided by Council indicates that funding for each priority walking and bicycle route would be identified as part of the budget nomination process. In addition, there is potential for pedestrian and bicycle facilities to be constructed by coupling the works onto planned and reactive maintenance works under taken by Council.

13.2.3 Other Funding Sources

Funding for bicycle riding infrastructure and promotion is also available from the following sources:

- NSW Bike Week event funding for the purpose of raising the profile of bicycle riding as a mode of transport;
- Sport & Recreation Participation Program which funds projects designed to increase participation in sport and recreation; and
- The Liveable Cities Program which funds projects which tackle the high level of car dependency in cities as a way to address the challenges of climate change, among others.

Table 13-1 Priority Levels for Proposed Bicycle Routes

Category	Land Use		Perception					Safety		Continuity of Routes			User Groups					Score	Rank
Weighting (%)	20		20					20		20			20						
Route ID	Proximity to Attractors / Generators	Future Development with Attractors / Generators	Road Hierarchy	Traffic volumes	Ease of use of existing roads	Attracts non-regular bicycle riders	Safety (perception)	Identified as Hazardous Area (from Site Audit and	Identified Pedestrian/ Bike Rider	Link existing facilities	Extension of facilities	Addition to facilities	Children	Older People	Shopping	Social	Commuting		
S1	3	2	2	2	2	3	2	2	2	2	2	3	3	3	3	3	3	80	**2**
S2	3	3	2	2	2	3	2	2	3	3	3	3	3	3	3	2	3	90	**1**
D1	1	2	1	1	2	3	1	1	1	3	2	2	3	2	1	3	1	56	**13**
L1	2	1	2	2	2	2	2	1	1	1	1	2	2	2	1	1	2	50	**14**
L2	3	1	2	2	2	3	2	2	2	1	2	2	3	2	2	2	3	68	**7**
L3	2	2	3	3	3	2	3	2	1	1	1	2	2	1	1	1	3	62	**9**
L4	2	1	2	2	2	2	2	1	1	1	2	2	3	2	3	2	3	58	**11**
L5	3	2	2	2	2	3	2	2	2	2	2	2	3	2	2	2	3	74	**4**
L6	3	2	2	2	2	3	3	2	1	2	2	2	3	2	3	3	2	73	**5**
L7	2	3	3	3	3	2	3	3	3	1	1	2	2	2	2	1	3	78	**3**
C1	3	2	2	2	2	3	2	2	2	1	1	2	2	2	2	2	3	68	**8**
C2	2	1	2	2	2	2	2	2	1	1	2	2	2	2	3	1	3	59	**10**
C3	2	1	1	1	1	2	1	1	1	1	2	2	2	2	1	1	1	45	**15**
C4	2	3	2	2	2	2	2	1	2	3	2	2	2	2	2	2	3	70	**6**
C5	1	1	1	1	2	3	1	1	1	3	3	2	3	2	1	3	2	56	**12**

14. Supporting a Culture of Active Transport

14.1 Introduction

The following chapter presents a strategy to support the development of a culture of walking and bicycle riding in Strathfield. The programs and activities proposed are informed by insights drawn from a combination of community engagement and the outcomes of workshops undertaken with a group of Council officers.

14.1.1 The Approach

This strategy adopts a behavioural model consisting of motivating factors and enabling factors. For a group of actors to adopt a particular behaviour both factors need to be active in their lives.

Motivating factors are understood to be intrinsic desires, connected to peoples' identities that attract them to certain behaviours. Motivations for walking and bicycle riding include being fit and looking good and the pleasure of walking and bicycle riding. Because motivating factors are intrinsic to peoples' identities they are generally not within the power of agencies to influence. Hence when motivations are weak it's necessary to rely primarily on infrastructure measures.

Enabling factors are changes to:

- Peoples' environments; and
- Their self-efficacy that lowers the perceived risks of acting.

In the case of walking and bicycle riding these include the existence of safe, efficient routes, the personal confidence to walking and bicycle safely, knowledge of suitable routes, and facilities at destinations. In principle, enabling factors are within the power of agencies to influence, so they are the primary focus of this behaviour change strategy.

The enabling factors for Strathfield are presented in Section 8.2.

14.2 The Enablers for Walking and Bicycle riding in Strathfield

Table 14-1 and Table 14-2 present summaries of the key enabling factors or conditions that need to be in place to support the goal of enabling more people to walk and ride a bicycle more regularly for all purposes in Strathfield. Table 14-1 focuses on the needs of young people and adults, whereas Table 14-2 focuses on the needs of young children.

Table 14-1 The Behavioural Model for Increasing Walking and Bicycle Riding Among Adults and Young People in Strathfield

Components of the Model	Enabling Factors (the conditions that need to be in place for the goal to be achieved)
Pre-trip / Individual Enablers A combination of intrapersonal and social factors that influence one's self-efficacy to and acceptance of walking and bicycle riding	**If Feasible** Better skills and confidence to ride with vehicular traffic on the road. The basic skills and confidence to ride a bicycle. Confidence and knowledge of walking routes. The opportunity to walk or ride as part of a group. A greater level of awareness of the rights and needs of bicycle riders among motorists. Access to a bicycle to "try before buying".

Components of the Model	Enabling Factors (the conditions that need to be in place for the goal to be achieved)
The Trip / Trip Enablers A combination of walking and bicycle riding infrastructure, wayfinding and relationships with other road users	**If Present** The provision of safe and comfortable walking and bicycle routes. Walking and bicycle routes that connect where people live with a range of destinations across the LGA. The provision of physically separated bike paths. Provision of safe pedestrian crossings at convenient locations along pedestrian desire lines. Provision of public seating and drinks stations (water bubblers) along walking routes.
End of Trip / Destination Enablers Primarily concerned with the provision of appropriate facilities at destinations	**If Present** More and better shower, changing and storage at key destinations, particularly workplaces. More and better bicycle parking at key destinations across the LGA.
GOAL: More adults and young adults walking and bicycle riding more regularly for all purposes	

Table 14-2 presents the key enabling factors to support more young children in Strathfield to walk and ride bicycles.

Table 14-2 Behavioural Model for Increasing Walking and Bicycle Riding Among Young Children in Strathfield

Components of the Model	Enabling Factors (the conditions that need to be in place for the goal to be achieved)
Pre-trip / Individual Enablers A combination of intrapersonal and social factors that influence one's self-efficacy to and acceptance of walking and bicycle riding	**If Feasible** The provision of basic bicycle skills training at schools. Encouraging "walking buses" to access schools. Crossing patrol provided at key pedestrian crossing locations near schools. Provision of mapping to identify safe walking and bicycle riding routes between residential areas and schools. A greater level of awareness of the rights and needs of bicycle riders among motorists. Council to work with schools to encourage children, parents and staff to walk or ride to school
The Trip / Trip Enablers A combination of walking and bicycle riding infrastructure, wayfinding and relationships with other road users	**If Present** The provision of separated, safe and comfortable walking and bicycle routes connecting residential areas with schools.
End of Trip / Destination Enablers Primarily concerned with the provision of appropriate facilities at destinations	**If Present** Bicycle parking at all schools across the LGA. Drinking fountains along walking routes
GOAL: More young children walking and bicycle riding more regularly	

The remaining sections of this chapter propose a number of behaviour change programs and activities that address the key enabling factors presented in Table 14-1 and seek to activate the key motivating factors identified through the community engagement process.

The key motivating factors identified through the community engagement process are:

- Health, fitness and to exercise;

- Fun and enjoyment;
- Social benefits;
- To reduce stress / improve relaxation;
- To save money on the cost of owning and maintaining a car; and
- To help the environment.

The decision to walk and ride a bicycle is rarely made in private without outside influence. It usually depends on an interaction between individual desires and abilities, social influences and the physical environment. Much attention has been given to getting the walking and bicycle riding infrastructure right. However, as a result, social influences are often neglected. As a result, a number of the initiatives seek to mobilise social influence.

14.3 Behaviour Change Programs

The following section presents a number of behaviour change programs to address the enabling factors (outlined in Table 14-1 and Table 14-2), specifically those related to the pre-trip component of the behavioural model. It should be noted that these behaviour change programs mainly focus on bicycle riding.

Program 1: Capacity Building Classes for Beginners

Purpose	The purpose of this program is to provide people within the community who would like to take up bicycle riding with the skills, knowledge and confidence to cycle.
Objectives	The key objectives are: to provide training in how to ride a bicycle on the road and on shared paths (including guidance on the rules of using shared paths) to provide people with the knowledge to buy a bicycle and associated equipment that are appropriate for their needs to provide people with the skills and knowledge to maintain a bicycle to provide people with the knowledge to plan a journey (including where to find information on routes)
Partners	Bicycle NSW Transport NSW approved bicycle riding training providers (e.g. Austcycle) Police
Audience	Young children and their parents Senior citizens Women (women only groups) All members of the community predisposed to bicycle riding
Activities	The key activities for this program include: Develop a curriculum for bicycle training in collaboration with a professional training body or service provider; Determine frequency of classes: run one class as a permanent fixture in the council calendar of events, and then run additional classes based on demand; Explore opportunities to run events with adjacent LGAs to manage demand; Determine appropriate facilities for classes, taking into account accessibility for the wider community; Widely advertise classes through a range of mediums and maximize exposure to members of the community who would not normally participate in bicycle riding events, groups etc.; Establish a system for capturing information on why people attended, their experience and what happened to their participation in bicycle riding after

Purpose	The purpose of this program is to provide people within the community who would like to take up bicycle riding with the skills, knowledge and confidence to cycle.
	attending (document some stories of change from participants for promotion through Council website and newsletters); Explore opportunities to provide classes specifically for school children, within schools; Develop a resources pack for people to download directly from council website, providing basic guidance on bicycle skills, knowledge and awareness for people who are unable or initially unwilling to attend the classes.

Program 2: Shared Path Coexistence Campaign

Purpose	The purpose of this program is to improve the relationship between users of shared paths by normalizing a code of conduct that provides for all users' needs.
Objectives	The key objectives are: Improve the awareness of the rules and etiquette for using shared paths; Normalise the proper use of, and reaction to, bicycle bells on shared paths; and Reduce the perception of risk associated with using shared paths.
Partners	Bicycle NSW Roads and Maritime Services Local sports bicycle riding clubs and walking clubs Police
Audience	All users of shared paths
Activities	The key activities for this program include: Develop a code of conduct for the use of shared paths (drawing on the availability of existing resources – see City of Sydney); Ensure that materials only use images of people in normal clothes riding sit-up or cargo bicycles. Ensure the brochure is concise, engaging and uses non-dictatorial language. Should be inclusive of all shared path users. Develop and test a range of signage for shared paths, that complement the code of conduct and focuses on three main rules only – avoid slogans, ensuring the rules are the focus of the signs. Run a series of events targeting shared paths across the LGA, distributing the code of conduct to all shared path users – include rewards for people who are displaying positive behaviours in-line with the code of conduct; Use these events to gather information, through interaction and observation, on the issues that are influencing behaviour on the shared paths – document this data and information and use it to develop further initiatives to improve how people share the paths. Run a series of workshops involving sports cyclists, non-sports bicycle riders and walking groups to raise awareness of needs and motivations in a friendly and fun environment: work with local bicycle riding clubs and advocacy groups – engage participants in exercises where they take the other persons' perspective This workshop must be carefully planned and professionally facilitated to avoid tensions to surface and conflict to emerge. The participants selected for the workshops should be interested in finding common ground, as a starting point for their involvement. Careful attention should be paid to documenting the workshops, capturing anecdotal evidence of changing attitudes.

Purpose	The purpose of this program is to improve the relationship between users of shared paths by normalizing a code of conduct that provides for all users' needs.
	The workshops should be followed up with a promotional campaign to disseminate the stories of change that emerge from the workshop.

Program 3: Bicycle Riding Legitimisation Campaign

Purpose	The purpose of this program is to raise awareness of the presence and rights of cyclists on the road in Strathfield
Objectives	The key objectives are: To trial a range of stencils, signs and markings that raises the expectation of the presence of bicycle riders on the road. To encourage motorists to drive more carefully in the presence of bicycle riders, specifically to drive slower and provide more space when overtaking / passing by bicycle riders.
Partners	Roads and Maritime Services Police
Audience	Motorists
Activities	The key activities for this program include: Undertake a review of best practice in signing, stencils and imagery for promoting the presence of bicycle riders on the road; Run a workshop with input from a communication designer to develop a set of concepts to trial in a targeted location in the LGA; Pilot and document the impact of the concepts over a 1-week period; Refine the concepts based on the learnings from the prototyping phase and roll out the signage to other locations. Engage with the RMS and the local police to promote the program and capture feedback from the public – use social media (both Council and RMS Facebook and Twitter) to drive a conversation about the program, the issue and to capture insights for developing the program further; Follow up the conversation phase with a series of workshops involving bicycle riders and motorists to enable road users to share needs and motivations in a friendly and fun environment: continue working with RMS – engage participants in exercises where they take the other persons' perspective. Ensure: This workshop is carefully planned and professionally facilitated to avoid tensions to surface and conflict to emerge. The participants selected for the workshops are interested in finding common ground, as a starting point for their involvement. Careful attention is paid to documenting the workshops, capturing anecdotal evidence of changing attitudes. The workshops are followed up with a promotional campaign to disseminate the stories of change that emerge from the workshop.

Program 4: Power-assisted Bicycle Trial Scheme

Purpose	The purpose of this program is to provide members of the community with the opportunity to experience a power-assisted bicycle to help reduce the perception that hills and distance are a major barrier for bicycle riding.
Objectives	The key objectives are: To raise awareness of the benefit of power-assisted bicycles for all members of the community, particularly senior citizens and those with physical impairments that would limit the distance they could travel on a normal bicycle. To raise awareness of the variety of bicycles available on the market.

Purpose	The purpose of this program is to provide members of the community with the opportunity to experience a power-assisted bicycle to help reduce the perception that hills and distance are a major barrier for bicycle riding.
Partners	Bicycle NSW Local bicycle shop or retailor of power-assisted bicycles
Audience	The wider community, but it is recommended that some senior citizens are encouraged to participate.
Activities	The key activities for this program include: Explore the provision of a number of power assisted bicycles (ranging in type) for the scheme: sponsorship may be an option in some cases; Develop a structure for the program: Participants should commit to a minimum level of use of the bicycle over an agreed period of time. Participants should commit to maintain a diary to document their experience. Participants should meet each other at the outset and the end of the program, to firstly establish a network and foster social interaction and secondly to compare and contrast their experiences. Participants should be rewarded for their involvement but care needs to be taken to how the rewards are structured i.e. to ensure they sustain their involvement. Establish a system to document the scheme and ensure that all outcomes (expected and unexpected) are captured. Promote the results of the scheme widely and set up a process for people to report purchases of power-assisted bicycles.

14.4 Promotion and Marketing

The following recommendations are proposed for the promotion and marketing of walking and bicycle riding in Strathfield:

- In order to normalize walking and bicycle riding among the community, all related marketing material (posters, brochures, fliers, website content etc.) should use images:
  - Of normal people riding in normal clothes;
  - Of people riding sit-up, electric / power assisted and cargo bicycles;
  - Of both genders but focus more on women; and
  - Of senior citizens.
- Create an easily accessible map of the walking and bicycle network, to include the location of walking and bicycle facilities, and highlighting specific routes for transport and/or leisure trips – propose some easy routes for beginner bicycle riders to try;
- Promote bicycle riding for travel to all Council run and sponsored events: provide bicycle parking at major events;
- Develop with stakeholders, the following programs to promote bicycle riding and walking in Strathfield:
  - Monthly Ride to Work or Walk to Work breakfasts;
  - A staff bicycle fleet for work related travel and lunch time personal use;
  - Bicycle riding skills and maintenance workshops;
  - Providing a bicycle purchasing scheme to Council staff for commuting to work;
  - “Leave your car at your home” day; and
  - Walking bus for schools.
- Create a one-stop-shop walking and bicycle riding webpage on the Council website.

- Promote all bicycle riding activity in Council newsletters, including the outcomes of behaviour change programs and progress on developing the walking and bicycle network.
- Explore running two residential street programs, closing off a section of the street to motorized traffic and providing a range of walking and bicycle riding related services and activities for local residents, including (but not limited to):
  - Bicycle maintenance;
  - Skills training;
  - Walking and bicycle riding route planning advice;
  - Distribute maps and promotional goods; and
  - Document feedback from residents on walking and bicycle riding in the community / LGA.
- Participate in NSW Bike Week – explore integrating with residential street engagement proposal.

15. Evaluating Success

The success of a plan or strategy can only be assessed if adequate monitoring or performance measures are included. The monitoring process will identify if the plan is achieving the desired behaviour change or facilitating the increased use of bicycles in the LGA. These also ensure that throughout the development of the plan, or program of works, the initiatives align with national, state and local planning objectives.

Identifying a monitoring method appropriate to a plan or strategy is critical to ensure time and resources are not misspent on processes that result in un-useful or irrelevant data collection and/or analysis. The measures outlined below present a range of options that could be easily tracked by Council officers and have been successfully used in previous Bicycle Plans and *AT-Strathfield*.

Council should install bicycle counting equipment at key locations within the LGA for the purpose of monitoring bicycle riding flows on a number of key routes. In addition to monitoring this data, it is considered that some other forms of monitoring may be required to measure the success of *AT-Strathfield*.

15.1.1 Modal Split

This measure provides an indication of demand for various modes of transport at an aggregate level. Typically, modes would be broken down into; private vehicle; train; bus and other (which would include bicycle riders).

This type of data can provide an indication of the overall level of bicycle riding use in the LGA. The percentage of bicycle riders can be obtained from the journey to work component of the Census or through the Household Travel Survey.

15.1.2 Vehicle Kilometres Travelled (VKT)

This measure also provides an indication as to the quality of the transport system within the region. Less vehicle kilometres travelled would imply that more residents utilise either active transport or public transport services in the LGA. This is measured through the Household Travel Survey and may take time to yield results.

15.1.3 Crash Injuries

Crash injury monitoring, and in particular for bicycle riders and pedestrians, provides a reasonably accurate indication as to the levels of safety that new strategies and plans have instigated, and as to whether targets are being achieved. Such statistics also highlight high risk zones that require further attention and planning.

15.1.4 Cycleway Usage

Performing regular bicycle counts is a highly effective way of determining the usage of cycle ways. Measurement methods would have to be standardised to ensure valid data is collected and is comparable across time periods. Consistent increases in usage would imply new cycle routes and improved conditions have provided a more efficient, safer network which is suitable for a larger proportion of the population.

Cycleway usage should be monitored through Council's monitoring program in addition to obtaining data from state authorities and participating in Super Tuesday counts and other monitoring activities.

15.1.5 Data Availability

It should also be noted that data availability is one of the key criteria for evaluating a projects success. Before one or more monitoring methods are adopted, the quality and quantity of data required must be carefully considered in the context of existing data sets and potential data sets.

16. Additional Considerations

The following sections discuss addiction considerations for *AT-Strathfield*, including maintenance of existing and proposed walking and bicycle infrastructure and the development of a Wayfinding Strategy.

16.1 Maintenance

16.1.1 Maintenance Considerations

Maintaining bicycle paths to be in a suitable condition is a key requirement to ensuring the plan's objectives are achieved. If the bicycle facilities are not adequately maintained to a suitable level of service, bicycle riders are discouraged from using them. Worse, bicycle riders may have the tendency to swerve into the path of vehicular traffic in order to avoid sections of deteriorated surface conditions, posing a safety hazard to both themselves and general traffic.

The importance of maintaining road assets and the financial impacts of not doing so is well known to most road authorities, including Councils. However, maintenance of bicycle paths after construction is less commonly incorporated into asset management programs.

At a minimum, Council's maintenance program for its bicycle network infrastructure should follow the standards it keeps for maintaining its road assets. An important consideration to make is to incorporate bicycle path maintenance within the overall road network asset management program.

16.1.2 Maintenance Items

As indicated in the *Guide to Traffic Engineering Practice, Part 14: Bicycles* (AUSTROADS, 1999), regular maintenance activities on bicycle paths should include:

- Filling of cracks;
- Trimming or removal of grass;
- Sweeping of paths;
- Re-painting of pavement markings;
- Cleaning of signs; and
- Trimming of trees and shrubs to maintain safe clearances and sight distances.

Other considerations may include regular audits of bridges, overpasses, underpasses and storm drain grates to ensure they are safer for bicycle riders.

16.2 Bicycle Riding Signage and Wayfinding

Signage for the bicycle network should be provided in conjunction with all new facilities. The main functions of signage for bicycle network facilities are:

- To assist users to find their way around the network; and
- To warn users of identifiable potential hazards within the riding environment.

The most important function of directional signage is to help users find their way around the network. Directional signage reinforces network connectivity and coherence and provides high visibility and recognition to the collection of routes which make up the wider cycle network.

In order to avoid ambiguity and conflict with motorised road users and bicycle riders, a completely independent system of signage for bicycle riders should be used. Council officers

are recommended to consult with bicycle network officers from the Roads and Maritime and adjacent councils to ensure a consistent, logical and useable set of destinations are selected.

Yellow diamond shaped warning signs are used to alert riders to changed or potentially hazardous path or road conditions. This type of signage is similarly used to alert other road users of intersecting or merging bicycle movements.

Bicycle signage should be provided in accordance with Australian Standard AS1742 – Manual for Uniform Traffic Control Devices Part 9 – Bicycle Facilities and Part 2 Traffic Control Devices for General Use (Australian/New Zealand Standards, 2000 & 1994).

17. Summary

GHD has undertaken this *AT-Strathfield* for Strathfield Council. Based upon a review of existing facilities and conditions, consultation with various bicycle user groups and an investigation into planned and proposed developments, *AT-Strathfield* has recommended potential improvements to the existing pedestrian and cycle facilities across the LGA.

The proposed improvements have also incorporated comments received from an extensive consultation process with the local community and have been based on indications of Council's available budget over a 10-year timeframe.

AT-Strathfield also provides guidance on additional measures to support increased bicycle use and walking activity in the LGA including maintenance, potential monitoring criteria, end of trip facilities, bicycle parking, behaviour change and bicycle riding promotion strategies and other 'softer' initiatives.

Appendices

Appendix A Community Consultation Report

Strathfield Council

Strathfield Active Travel Plan

Bicycle Riding and Walking Surveys

June 2016

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Figure index

1. Introduction

Strathfield Council encourages and supports sustainable transport options including cycling and walking. Council recognises the importance of pedestrian activity and the interaction between walking and cycling. To plan for current and future needs of pedestrians and cyclists within Strathfield Local Government Area (LGA), GHD is working with Council to develop a new Active Travel Plan. To understand the current needs, GHD developed two surveys:

- Bicycle Riding Survey.
- Walking Survey.

The purpose of these surveys was to allow the community to provide information about existing pedestrian or cycling conditions or issues in the Strathfield area. The surveys were made available online to capture a broader cross-section of stakeholders, including users not local to the Strathfield area. The surveys were advertised on Council's website and also provided to local Bike User Groups via email from Bicycle NSW.

The Bicycle Riding Survey received a total of 59 responses. The Walking Survey did not receive any responses. This report provides an analysis of the Bicycle Riding Survey results only, including the key issues and priorities raised by the community.

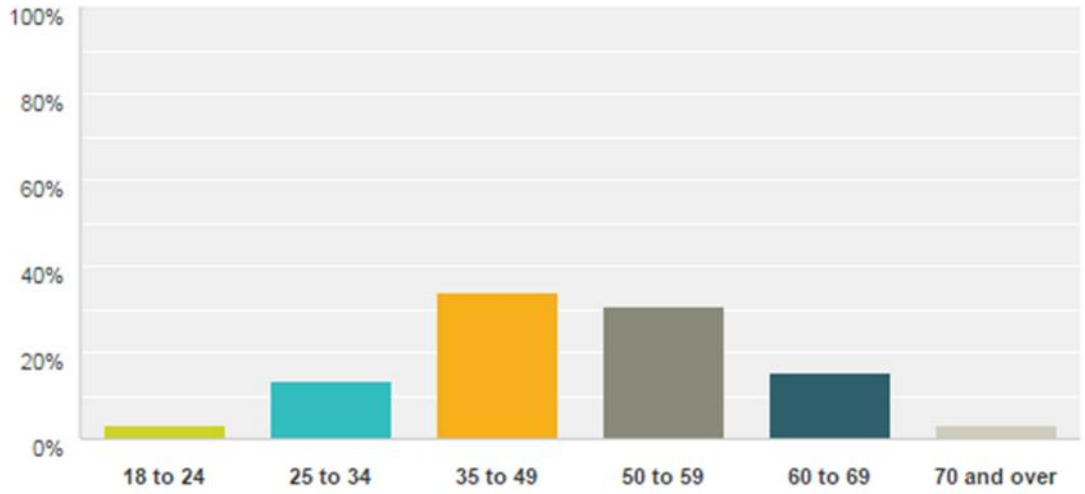
2. Survey results

2.1 Profile of respondents

Respondents were asked to provide their gender and age. All respondents answered. 76% of respondents were male and the remaining 24% were female.

Figure 1 shows the age of respondents. Around one-third of respondents (34%) were 35-49 years old. This was followed by 50-59 year olds (31%) and 60-69 year olds (15%). A small proportion of 18-24 year olds (3%) and people aged 70 years and older (3%) answered the survey.

Figure 1 Age of respondents



2.2 Bicycle usage

Respondents were asked if they owned a bicycle and how frequently they use it. All respondents answered this question.

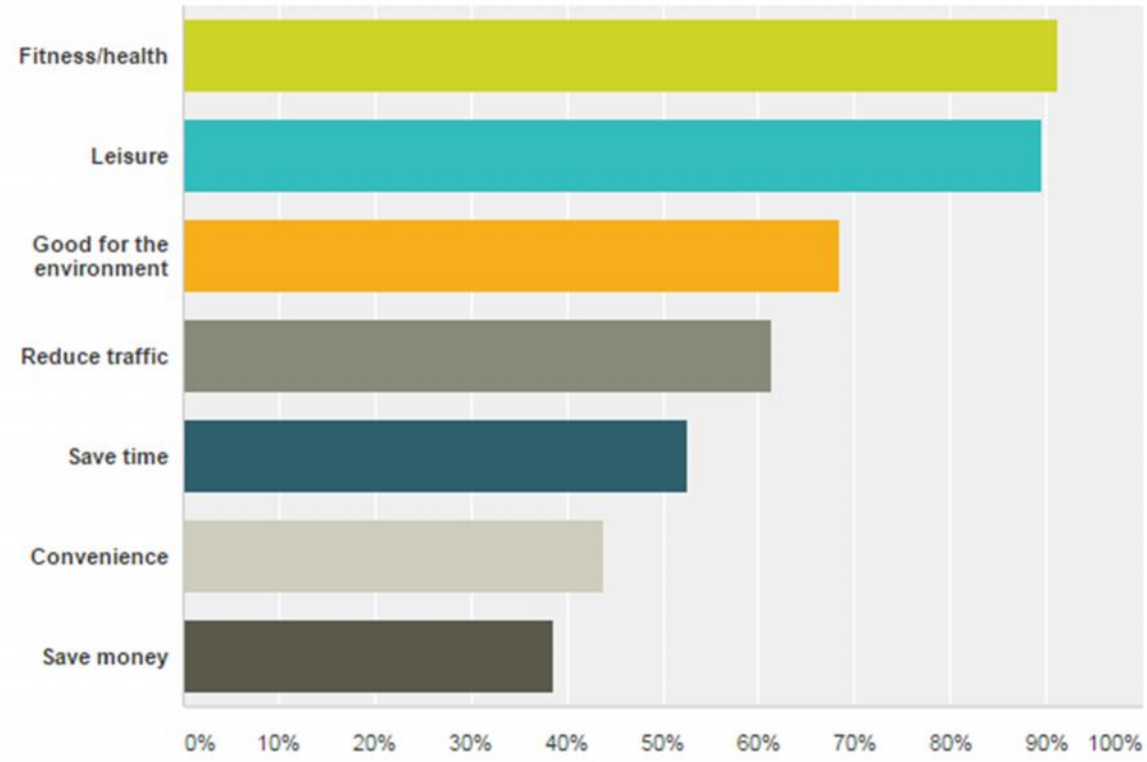
Most respondents (64%) owned a bicycle and use it most weekdays. Some respondents (32%) use their bicycle at least once a month while 2% own a bicycle but do not use it. 2% did not own a bicycle and were not interested in cycling even if cycling conditions were improved.

2.2.1 Reasons for cycling

Respondents were asked why they choose to cycle. Respondents could provide more than one answer. Two respondents did not answer. The most common reasons were:

- Health and fitness (91%).
- Leisure (89%).
- It is good for the environment (68%).
- It reduces traffic congestion (61%).
- It saves time (52%).

Figure 2 Reasons why people cycle

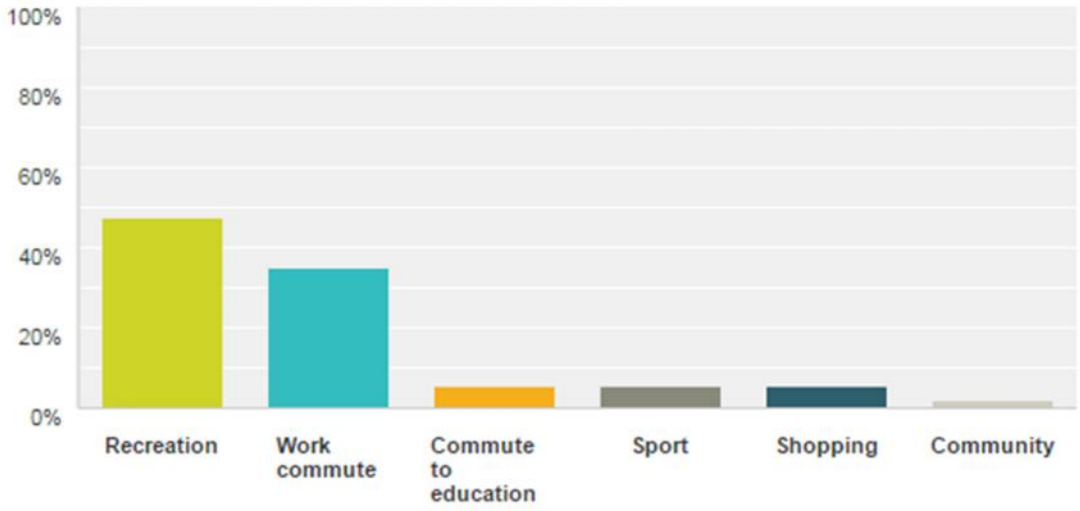


2.3 Cycling trips

Respondents were asked to provide the type of cycling they take part in most often. Two respondents did not answer. The most common types were:

- Recreation (47%).
- Work commute (35%).
- Commute to education facility (e.g. school, tertiary education), sport or shopping purposes (all 5%).

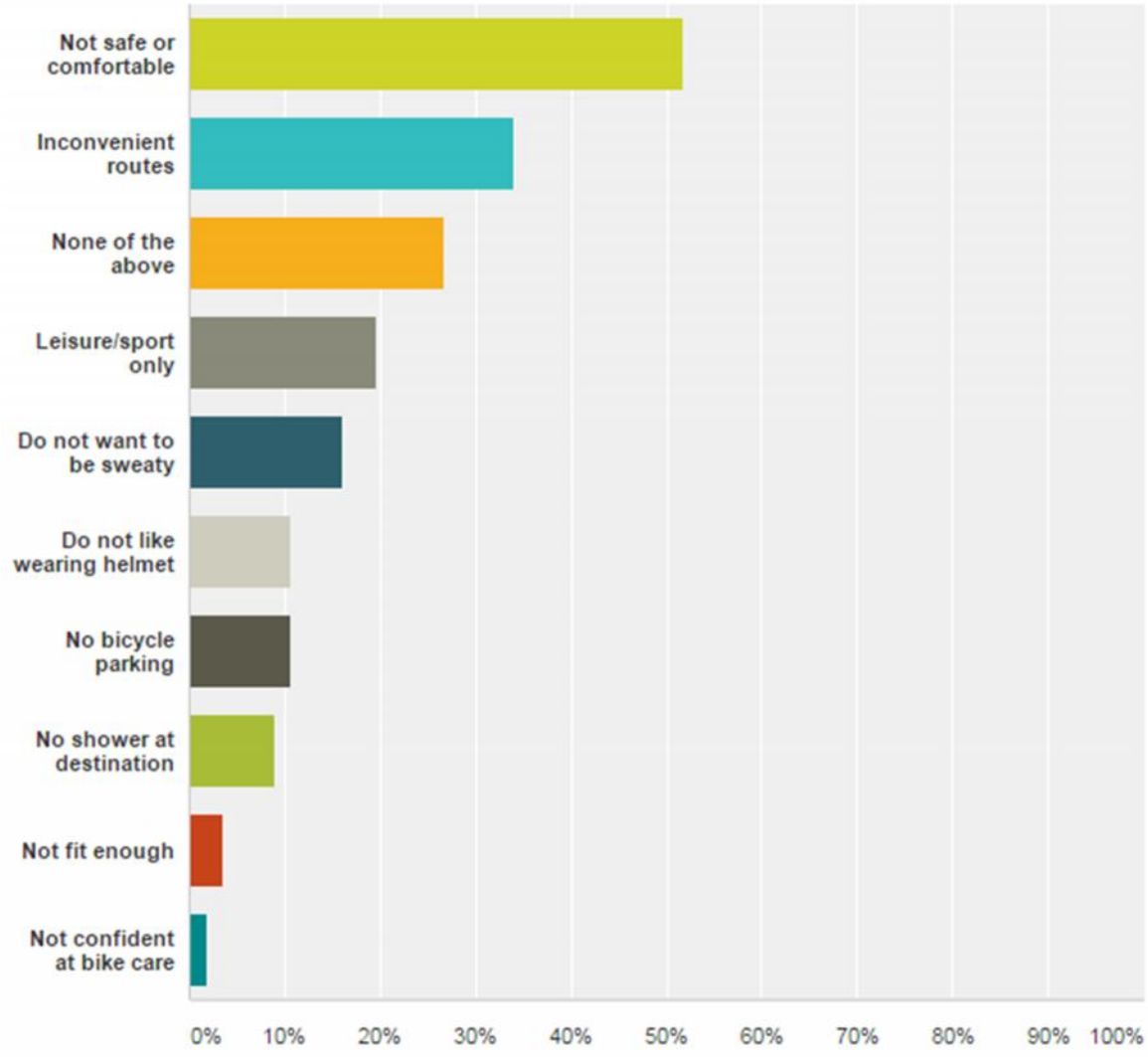
Figure 3 Type of cycling



Respondents were asked why they do not ride more reguarly for everyday local trips or commuting to work or study. Three respondents did not answer. The most common responses were:

- Available routes are not safe or comfortable (52%).
- Routes are not convenient (34%).
- None of the above (27%).
- They cycle only for leisure, recreation or sport (20%).
- They do not want to be sweaty when they reach their destination (16%).
- They do not like wearing a helmet or there is no bicycle parking at their destination (both 11%).

Figure 4 Reasons why people did not cycle more regularly



2.4 Available cycling routes

Respondents were asked to provide reasons why they felt available routes were unsafe or uncomfortable by travel purpose (i.e. shopping, school or work). Six respondents did not answer.

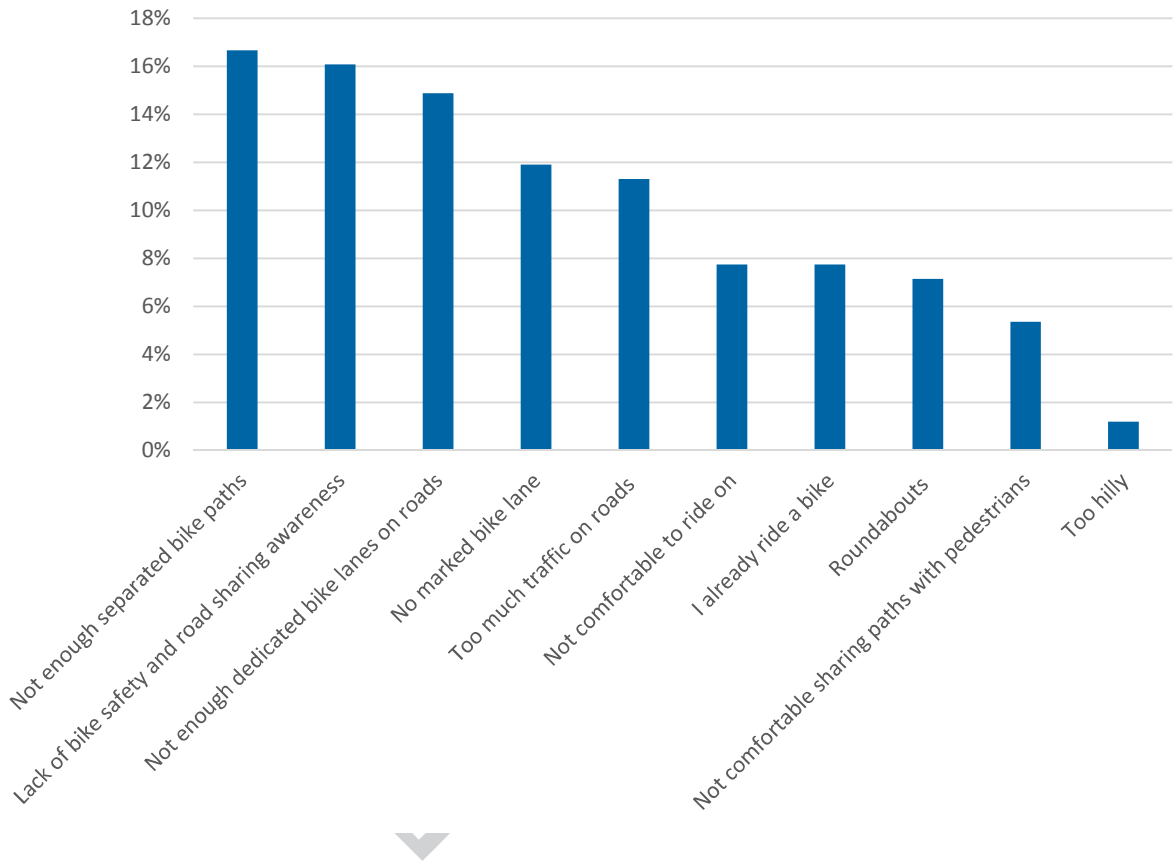
2.4.1 Shopping trips

The most common reasons why respondents felt that available routes were unsafe or uncomfortable for shopping trips were:

- There are not enough separated bicycle paths (17%).

- Lack of bicycle safety and road sharing awareness by other road users (16%).
- There are not enough dedicated bicycle lanes on roads (15%).
- There are no marked bicycle lanes on roads (12%).
- There is too much traffic on roads (11%).

Figure 5 Reasons why respondents felt available routes were unsafe or uncomfortable for shopping trips

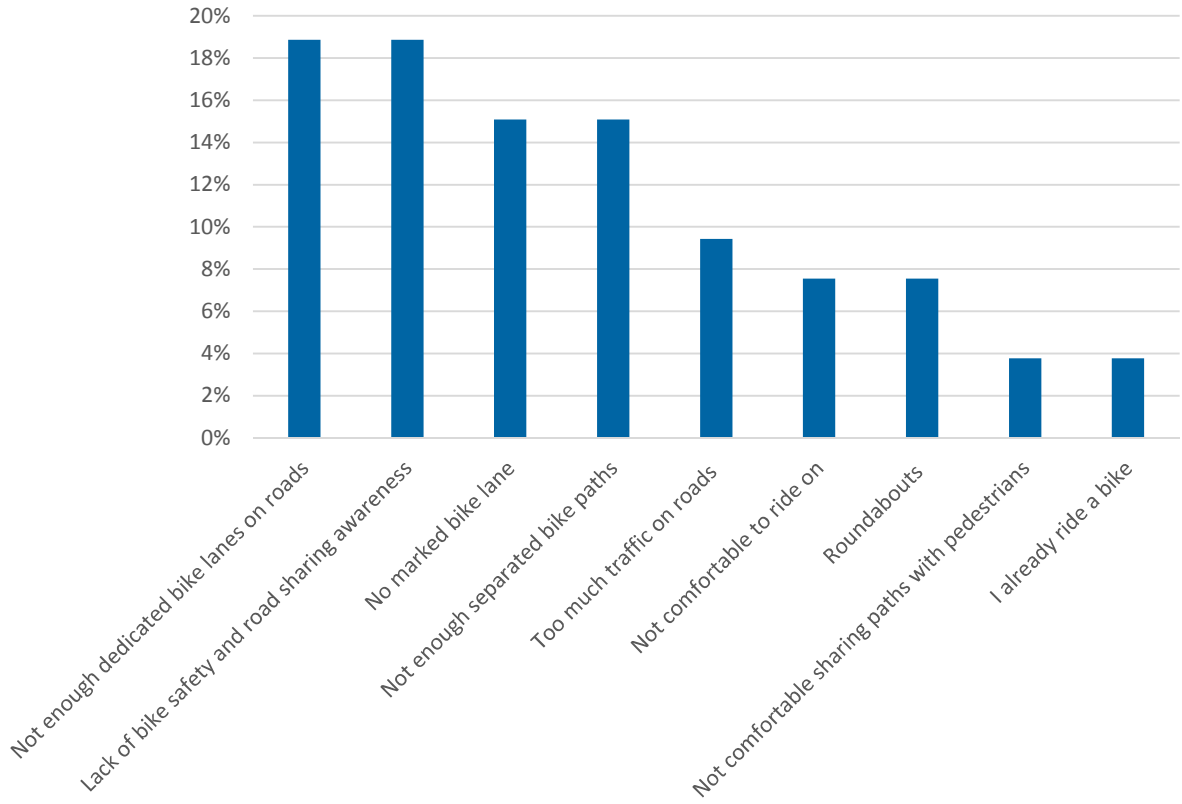


2.4.2 School trips

The most common reasons why respondents felt that available routes were unsafe or uncomfortable for riding to/from school were:

- There are not enough dedicated bicycle lanes on roads, and lack of bicycle safety and road sharing awareness by other road users (both 19%).
- There are no marked bicycle lanes on roads, and not enough separated bicycle paths (both 15%).
- There is too much traffic on roads (9%).
- The routes are not comfortable to ride on, and having to use roundabouts (both 8%).

Figure 6 Reasons why respondents felt available routes were unsafe or uncomfortable riding to/from school

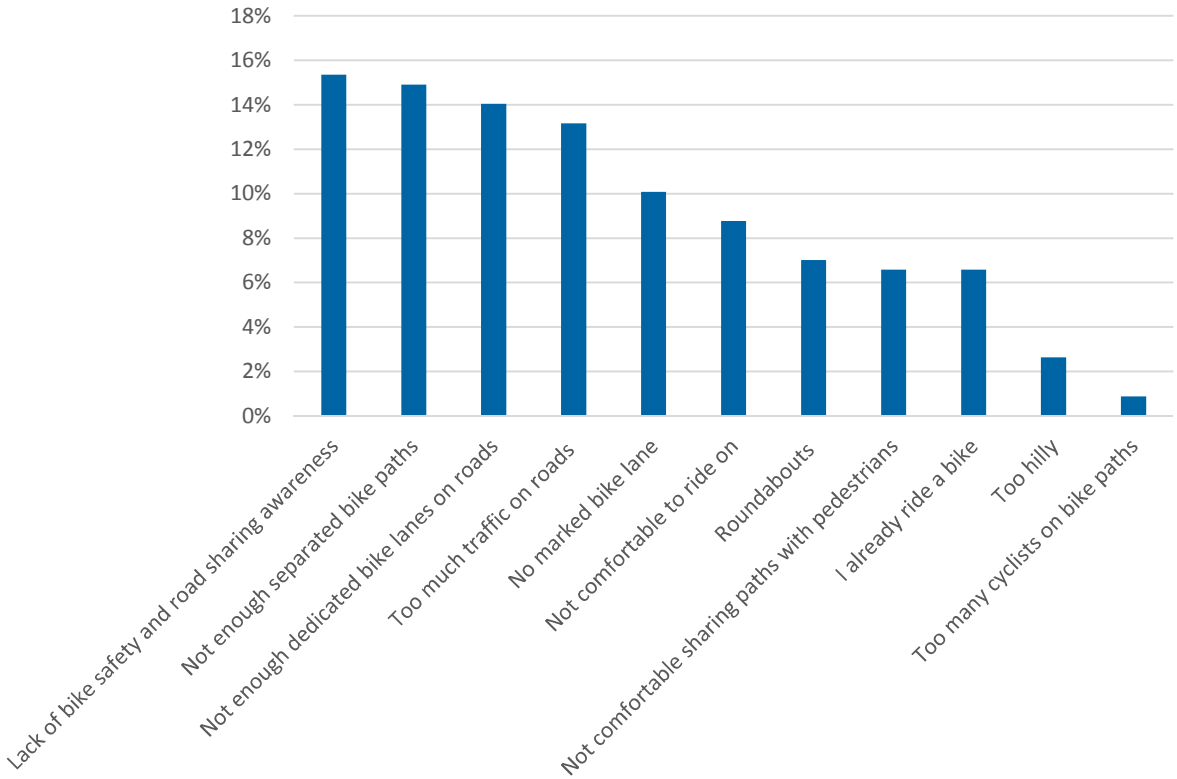


2.4.3 Work trips

The most common reasons why respondents felt that available routes were unsafe or uncomfortable for riding to/from work were:

- Lack of bicycle safety and road sharing awareness by other road users, and not enough separated bicycle paths (both 15%).
- There are not enough dedicated bicycle lanes on roads (14%).
- There is too much traffic on roads (13%).
- There are no marked bicycle lanes on roads (10%).

Figure 7 Reasons why respondents felt available routes were unsafe or uncomfortable riding to/from work



2.5 Types of cycling paths

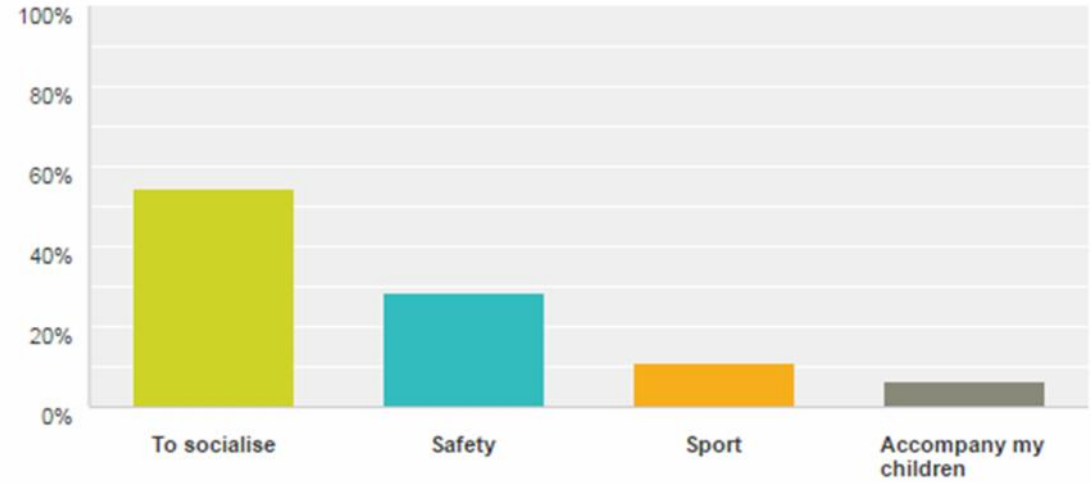
Respondents were asked to identify the type of path they typically ride their bicycle on. Seven respondents did not answer.

Riding on the road with no marked bicycle lane was the most common (83%), followed by riding on a marked road with a painted line (73%) and off road shared pedestrian path (71%). The least used path was off road (21%) including mountain bike and National Park tracks.

2.6 Cycling behaviour

Respondents were asked if they cycle with other people. Seven respondents did not answer. Most cyclists choose to ride with other people (88%) whereas only 12% choose to ride alone. Those who ride with others were asked to provide one or more reasons. Thirteen respondents did not answer. Most respondents wanted to socialise (54%), followed by safety riding in a group (28%), sport (11%) and accompanying children (7%).

Figure 8 Reasons why people cycle with others



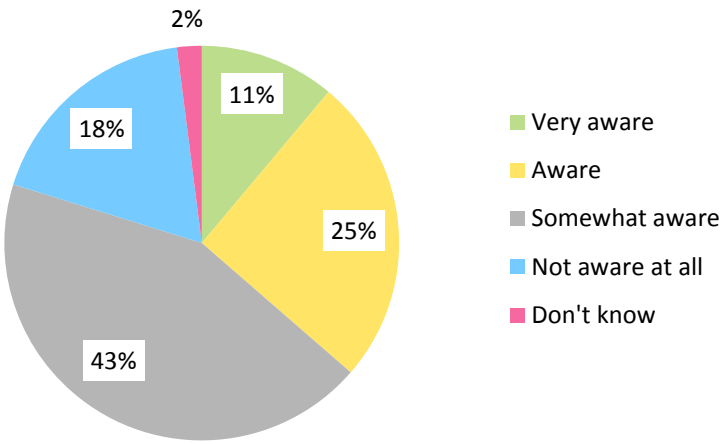
Respondents were also asked if they participate in any bicycle groups or events. Sixteen respondents did not answer. 60% said they belong to a bicycle riding group or club, 25% ride on 'Ride to work day' and other bike travelling events, 9% said they participate in skills, maintenance and safety related courses and 4% said none of the above.

2.7 Existing bicycle network

Respondents were asked to indicate their awareness of the existing bicycle network in Strathfield. Fifteen respondents did not answer. The answers were as follows:

- Very aware (11%).
- Aware (25%).
- Somewhat aware (43%).
- Not aware (18%).
- Do not know (2%).

Figure 9 Awareness of existing bicycle network



2.7.1 Popular routes

To identify the most common bicycle routes used by cyclists, respondents were asked to list their main journeys. Fifteen respondents did not answer. Similar responses were grouped by location. The most common routes/locations were:

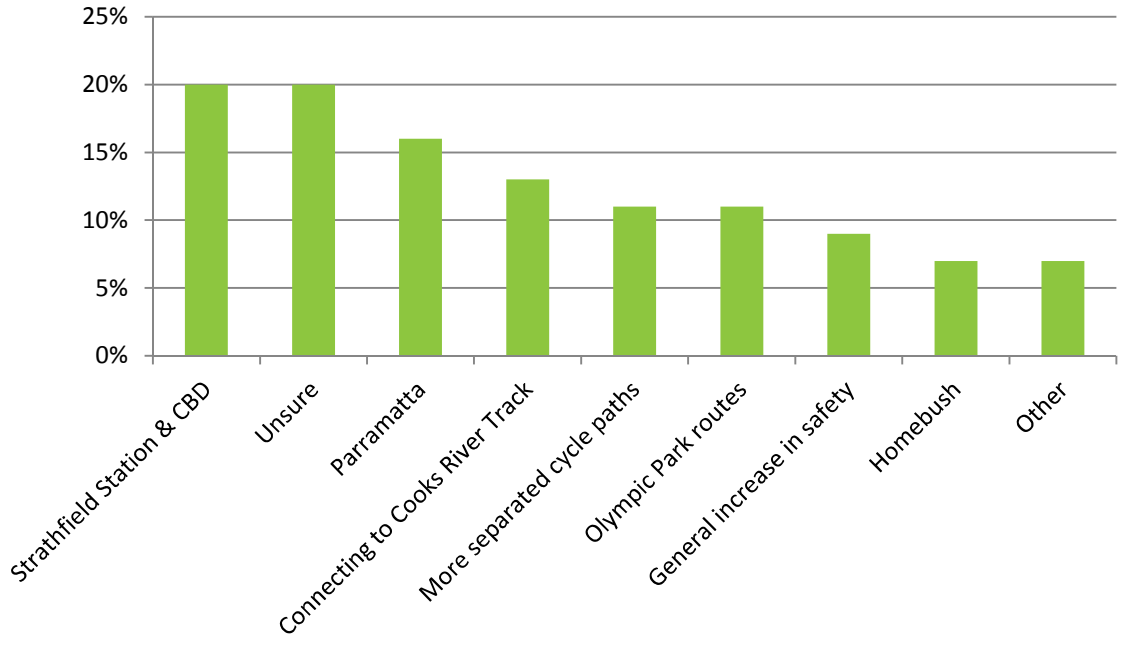
- Olympic Park/Stadium (e.g. roads including Maria, Homebush and Francis) (30%).
- The Cooks River Track (25%).
- Parramatta (including Parramatta Road) (18%).
- Strathfield Station (e.g. roads including Barker, Gladstone, Wentworth, Everton, Coronation) and Concord (e.g. roads including Correys, Flavelle) (both 16%).
- Park Road, Homebush (9%).
- Burwood, North Sydney, Homebush Bay (7% for each).
- Croydon Park and Summer Hill (both 5%).

2.7.2 Gaps and potential improvements

Respondents were asked to identify gaps and potential improvements for the Strathfield bicycle network. Sixteen respondents did not answer.

The biggest concern for respondents were the networks around Strathfield Station and Strathfield CBD (20%). The next common concerns were Parramatta (including Parramatta Road) (16%), roads and paths connecting to Cooks River Track (13.95%), Olympic Park routes, and the need for more separated cycle paths (both 11%). 20% were unsure.

Figure 10 Gaps and potential improvements for the existing bicycle network



2.8 Benefits

Respondents were asked to identify the benefits of regular cycling. Only two respondents answered. Both respondents identified the following benefits:

- It saves money on petrol, car or transport costs.
- It is good for the environment.

- It supports fitness and health.
- It is fun and enjoyable.
- It reduces parking demand and reduces traffic congestion.

2.9 Reasons why people did not cycle

Respondents were asked to provide reasons why they do not ride a bicycle. Only two respondents answered this question, with the following results:

- One respondent did not know how to maintain a bicycle.
- One respondent did not want to feel sweaty after riding.
- Both respondents do not think available routes are safe or comfortable.
- One respondent stated there is no shower or change room at their destination.
- One respondent stated there is no bicycle parking at their destination.

Respondents were asked to provide reasons why they feel available routes are unsafe or uncomfortable. Only two respondents answered, with the following results:

- One respondents stated that the road has no marked bicycle lane.
- Both respondents said there are not enough separated bicycle paths, dedicated bicycle lanes on roads and awareness about bicycle safety and road sharing by other road users. Both also identified roundabouts as a barrier.
- One respondent did not feel comfortable sharing off-road pedestrian paths.
- One respondent felt there was too much traffic on roads.

2.10 Encouraging cycling

Respondents were provided with a list of potential improvements and asked to rank whether or not the change would encourage them to definitely cycle more, maybe cycle more or make no difference.

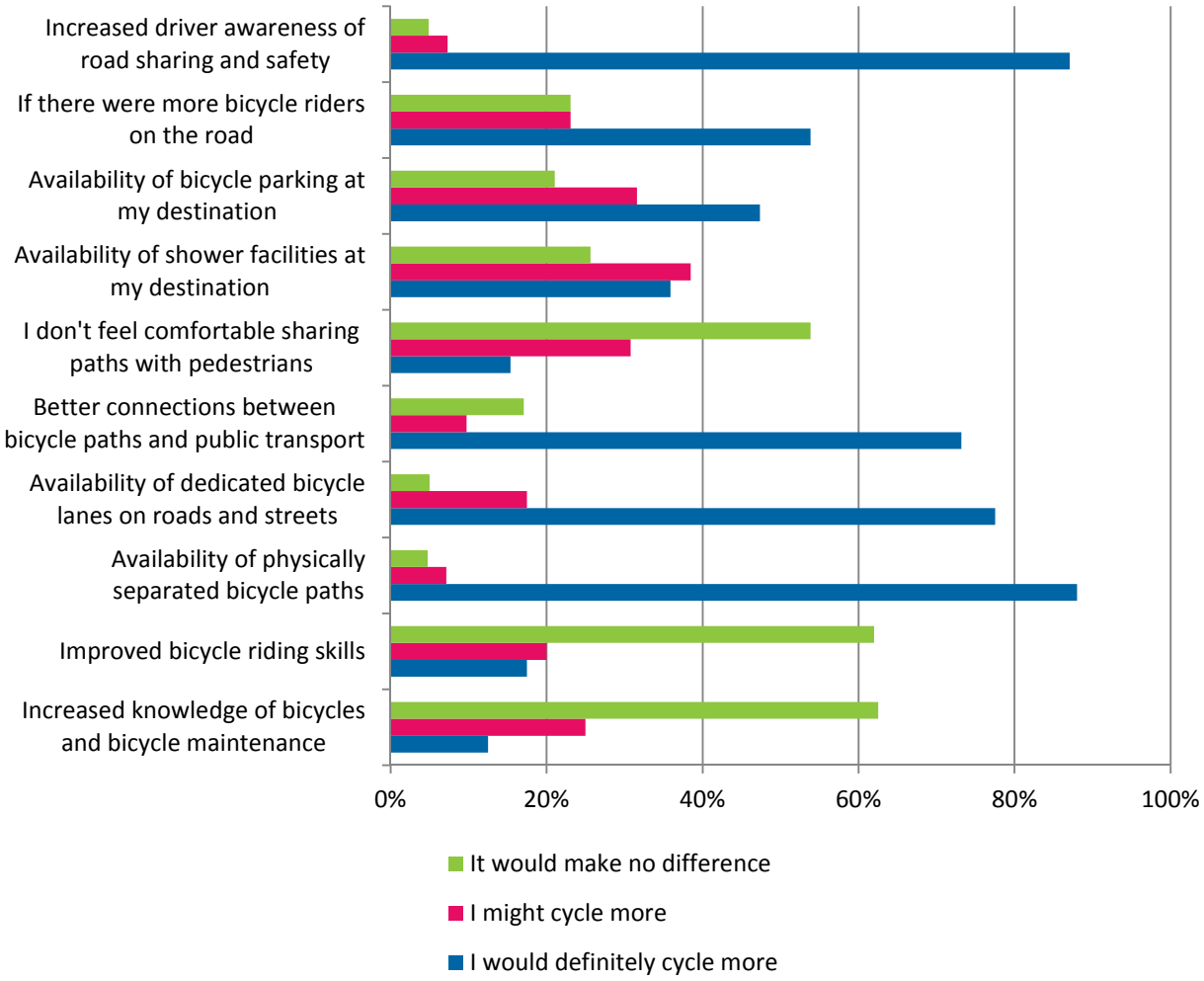
Respondents felt that they would definitely cycle more if:

- There were more separated bicycle paths available, and increased driver awareness of bicycle safety and road sharing (both 80%).
- There were more dedicated bicycle lanes on roads (78%).
- There were better connections between bicycle paths and public transport (73%).
- More cyclists were on the road (54%).
- Bicycle parking was available at their destination (48%).
- Shower and changing facilities were available at their destination (36%).

Improvements which respondents felt would make no difference in cycling behaviour included:

- Increasing knowledge of bicycles and bicycle maintenance, and improved bicycle riding skills (both 63%).
- Improving confidence riding on shared paths with pedestrians (54%).

Figure 11 Potential improvements that may encourage cycling



2.11 Cycling among children

Respondents were asked if they have any children under 15 years old. 24% said yes and 76% said no. Seventeen respondents did not answer.

Respondents were also asked to provide their child's current level of education. Only ten respondents answered. Six respondents had children attending high school. Four respondents had children attending primary school. One respondent had a child/children attending infants school, while one respondent had a child/children in pre-school/day care.

Those with children were asked if their children ride a bicycle. Only ten respondents answered.

All respondents said yes. Three of these respondents said their children ride to school or around the local area, while the remaining seven respondents said their children only ride around the park or in their driveway/yard.

2.11.1 Mode of transport used by school children

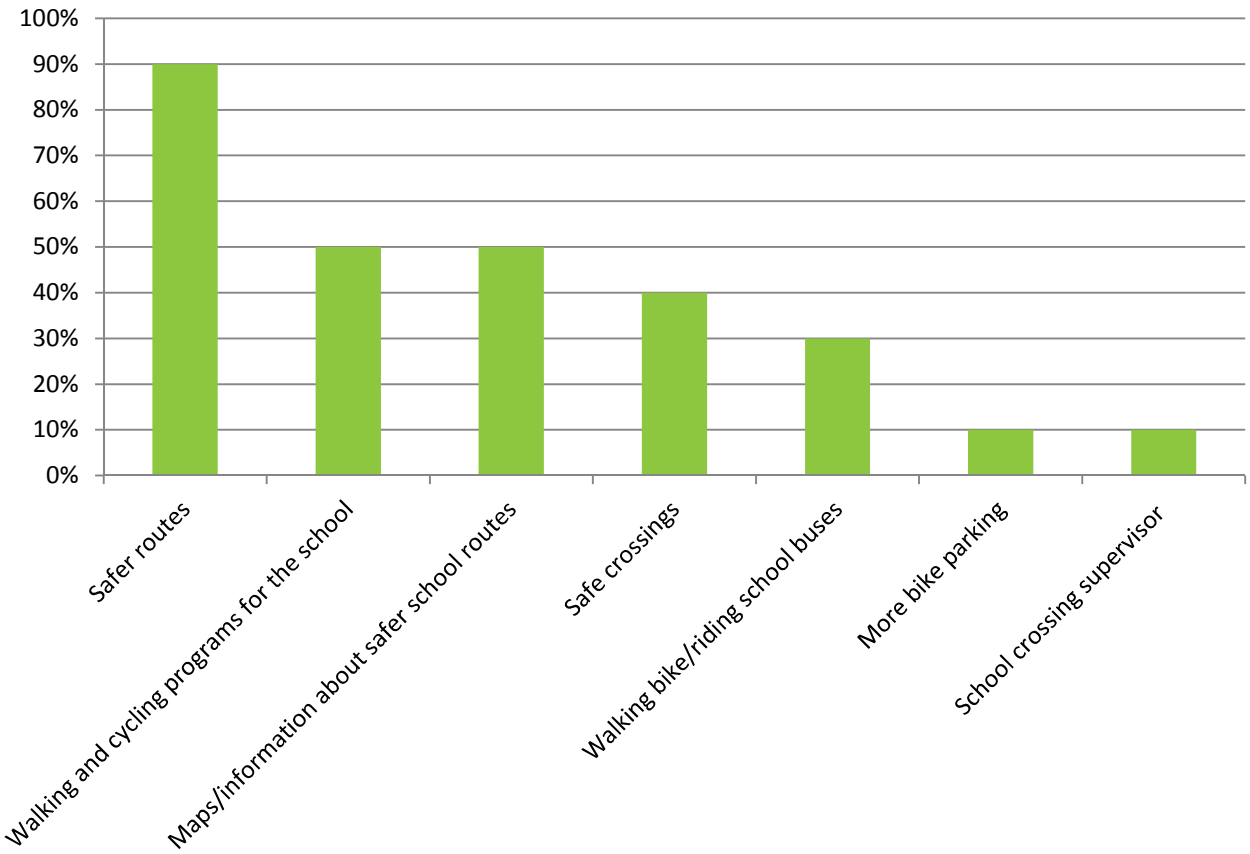
Respondents were asked what mode of transport their children use to travel to school. Only ten respondents answered. Four respondents drove their children to school. Four respondents said their children walked to school. Three respondents said their children travelled by bus. Only one respondent said their child cycled to school.

Respondents were asked what improvements in the Strathfield area would enable their children to ride or walk to school and travel around their local area more regularly. Respondents were able to choose more than one answer. Ten respondents answered.

The top answers were:

- Providing safer routes (90%).
- Implementing walking and cycling programs for the school, and providing maps/information on safer routes to the school (both 50%).
- Providing safe crossings (30%).

Figure 12 Potential improvements that may encourage cycling



GHD

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Document Status

Revision	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
A	CL	MS	On file	MS	On file	30/06/16

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Appendix B Comments from Bike User Groups (BUGs)

As mentioned last week I have sought comments from Canada Bay Bicycle user group members on the "Figure 3 Proposed Bicycle Network Plan" for Strathfield that Ray Rice distributed on 17/6/16. I haven't done a lot of editing, and have left in the contributor's personal pronouns. Only some of them are references to me. Happy to meet to discuss.

1. General comments are:

a) Given the lack of provision for bicycle riding in Strathfield apart from the Bay To Bay route, taking the initiative to propose a plan with a relatively fine grid and an intention to form separated cycleways is something to be congratulated.

b) Apart from routes it is vital that Council aim high with their plan objectives, which if to be taken seriously need to be measurable, e.g. like increasing bicycle riding modal share to 1% over a decade. Council also needs to be thinking about where the money is coming from and priorities. For example if the money is to be part/all grant money - the human resources to get the grants must be planned for. In terms of priorities it is important to get useful continuous routes built, like the Bay to Bay, rather than disconnected features. For example they may choose to prioritise the completion of all of the on road line markings. Or to first complete just one of the more expensive off road routes.

c) Big questions arise over how and when.

d) Without seeing the details of the types of facilities proposed one can't form a view as to how useful they will be to less confident/skilled riders.

e) There are no schools marked on the route. I would expect a serious bike plan to go past all the schools, colleges and Universities in the area. For example neither Homebush West public school or the library in Rochester Street appear to be treated as destinations. Provide designated shared status cycleway access on the immediate approaches to all schools in the area. Have noted Homebush West Public School is about to be redeveloped to increase enrolment capacity from 480 to 900.

f) The green separated cycle ways follow some very busy roads. e.g. Raw Square where a pedestrian was recently killed.

g) I'm curious to know how the green cycle ways are going to be separated.

h) The Underwood Rd separated route finishes at one of the most notorious intersections in Sydney. The saving grace? is that it's right next to DFO. Can't find a better way of accessing Olympic Park?

i) Coronation Parade can get very busy, yet it has an on-road cycle route south of Liverpool Rd.

j) Separated off road cycleways (Dutch style) on each side of main arteries is my preferred option . This would apply to both Coronation Parade/The Boulevarde , Homebush Road and Parramatta Road. An essential part of these is priority continuity at non lights controlled intersections with minimum impediments at kerbs. (I do not personally use The Boulevarde except at the Strathfield shops end as part of travelling between Burwood and Homebush. Travelling North - South, I generally prefer the Bay to Bay route, or Homebush Road.)

k) Hopefully a more detailed plan will deal with the important issues of cycle parking, in terms of schools, public facilities like libraries (there is no useful parking at Homebush library) and railway stations and bus stops, shops, shopping centres and in residential locations, particularly where densities are high.

2. More specific route related comments

a) Upgrade the Parramatta Road southern footpath to designated shared use standard for safety and access to Flemington Markets and the numerous businesses just outside Strathfield Council area. A priority should be gentle / smooth kerb ramps at all intersections to provide safe continuity. Locations

include Couralie and Telopea avenues intersections. and Markets access intersections around Markets shops and Potts Street.

b) Widen the Marlborough Road bridge path across the rail corridor;

c) Create a kerb ramp at western end of the Crescent at Homebush West to provide smooth safe access for cyclists to the shared cycle path to improve the amenity for all users.

d) At Hampstead Rd / The Crescent Homebush West intersection, reduce obstructions to improve visibility for vehicles turning east.

e) On the Bay to Bay Route in Bates Street opposite No 6, construct a kerb ramp to allow access to the cycleway, which to this point is relatively narrow. Alternative is to widen the path up to The Crescent

f) Upgrade / Widen the Bridge Road west footpath between rail line and Parramatta Road to shared path status with appropriate status markings. This is a major route for Homebush Boys students headed for their playing fields as well as cyclist not keen to be on the road for safety reasons. Concrete this area for about 50 metres (to past the Electricity Station) to a point where cyclists can then access Bridge Road with more adequate visibility. The tree north of the substation and the sub station are major visibility impediments.

g) Fit a light over the Pomeroy Street end of the Pedestrian / Cycle Bridge over the M4 to improve night vision and safety.

h) The figure 3 map shows some connectivity between Smallwood Ave north of the railway line and The Crescent which does not exist. Unless something very grand is proposed the existing route from the end of the Pedestrian / Cycle Bridge over the M4, left onto Park and right onto Hillcrest, crossing Parramatta Rd at lights to Bridge Rd is presumably what should be mapped.

i) Regularly maintain the Bay to Bay route path, particularly along Powell Creek and through Mason Park . The path gets badly affected by roots of nearby trees.

j) The Mason Park Car Park for the playing Fields and DFO was constructed with motor vehicle traffic calmers that represent a hazard for normal cyclists. Recommend moderation or removal of a 300mm gap at each barrier for cyclists passing on route to/from Underwood Road.

k) Will appreciate separated cycleways each side of Underwood Road.

l) Widen Pomeroy Street Powell Creek Bridge to provide a cycle lane with continuity.

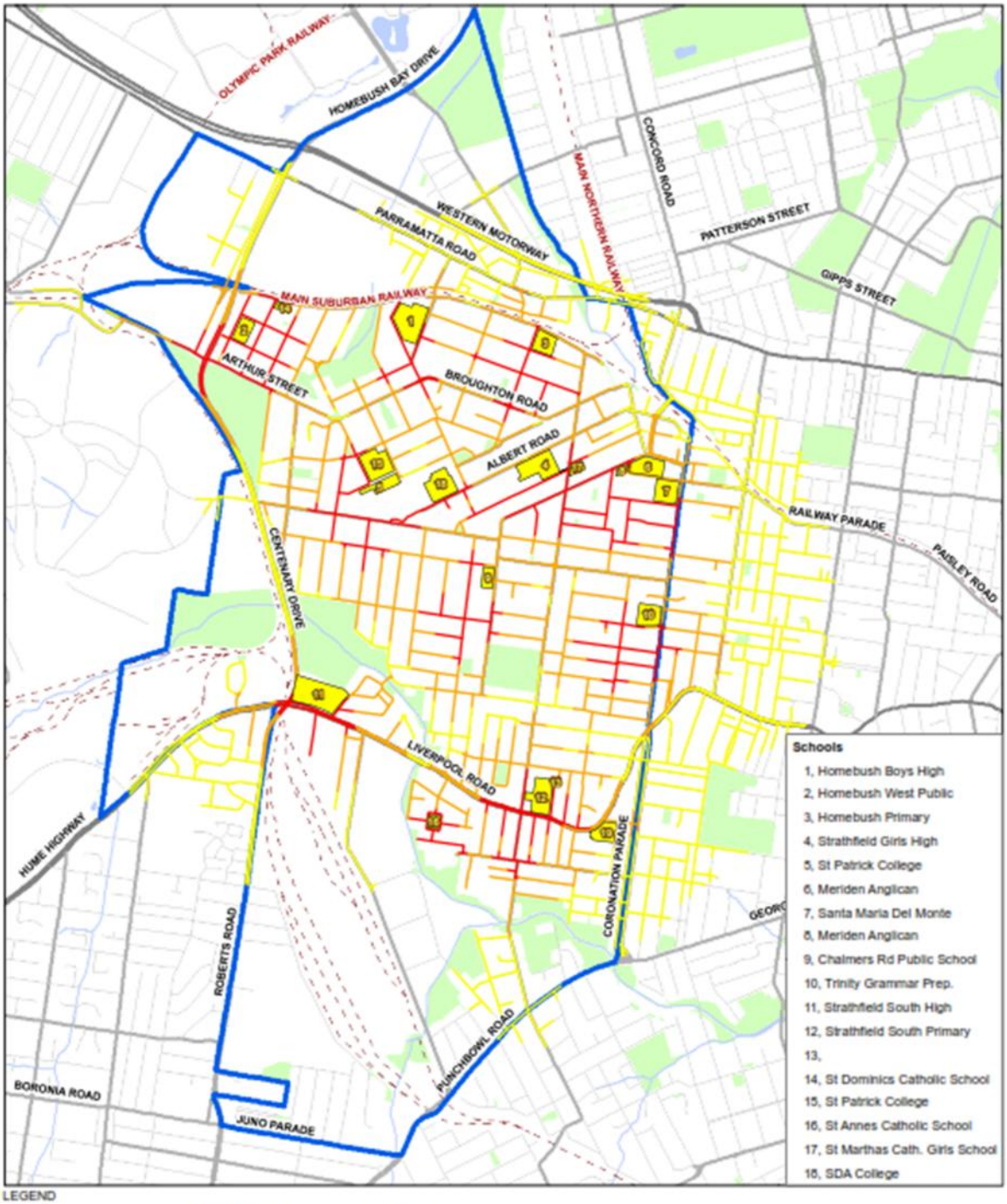
m) Arrange a priority repair / removal of a major safety hazard for cyclist just to west of the Pomeroy Street Powell Creek bridge, the result of rough repair work following one of a number of services works done in the last year.

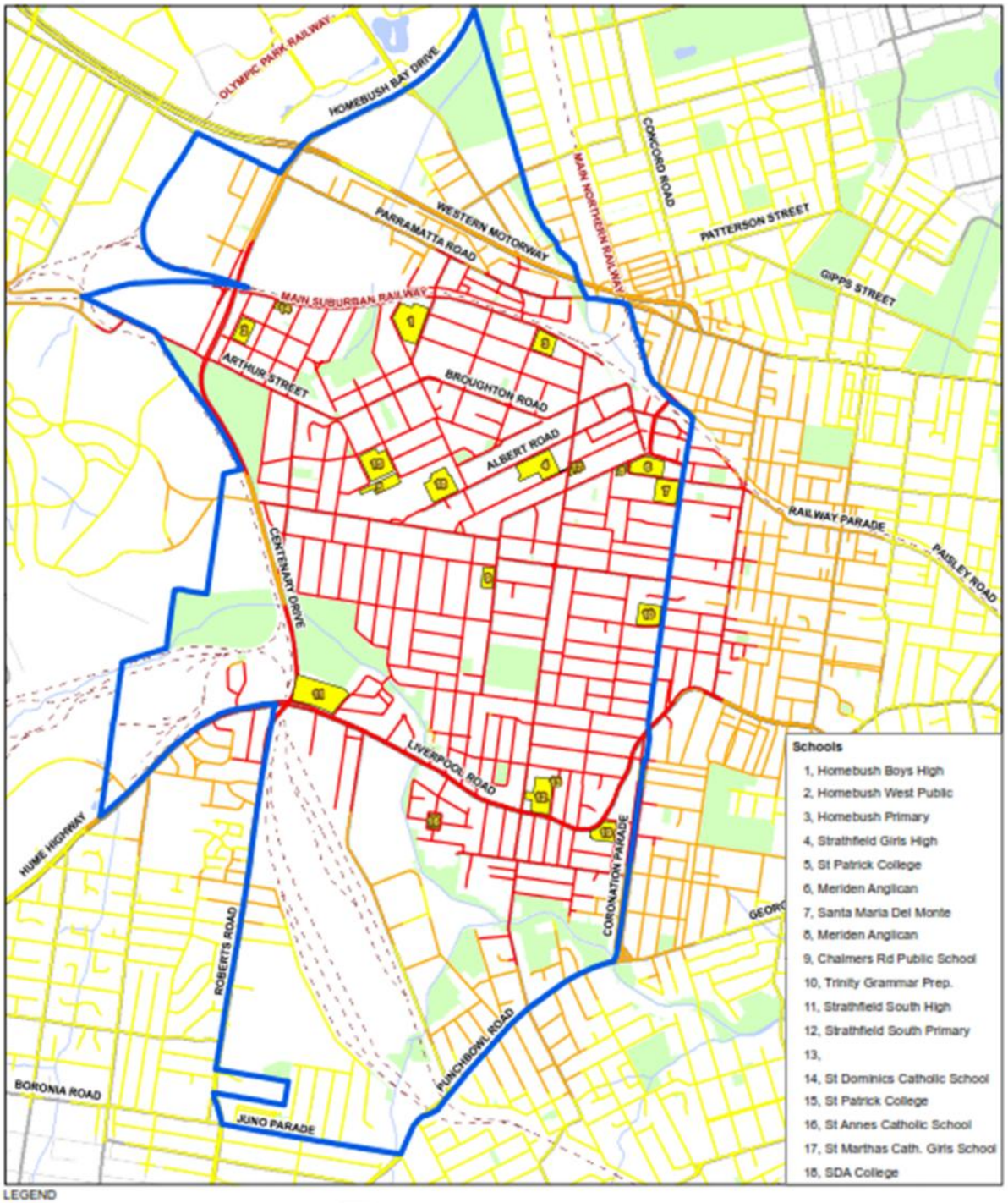
n) Provide improved cycleway access between north and south of rail corridor at the Homebush Underpass. (Subway Lane to The Crescent).

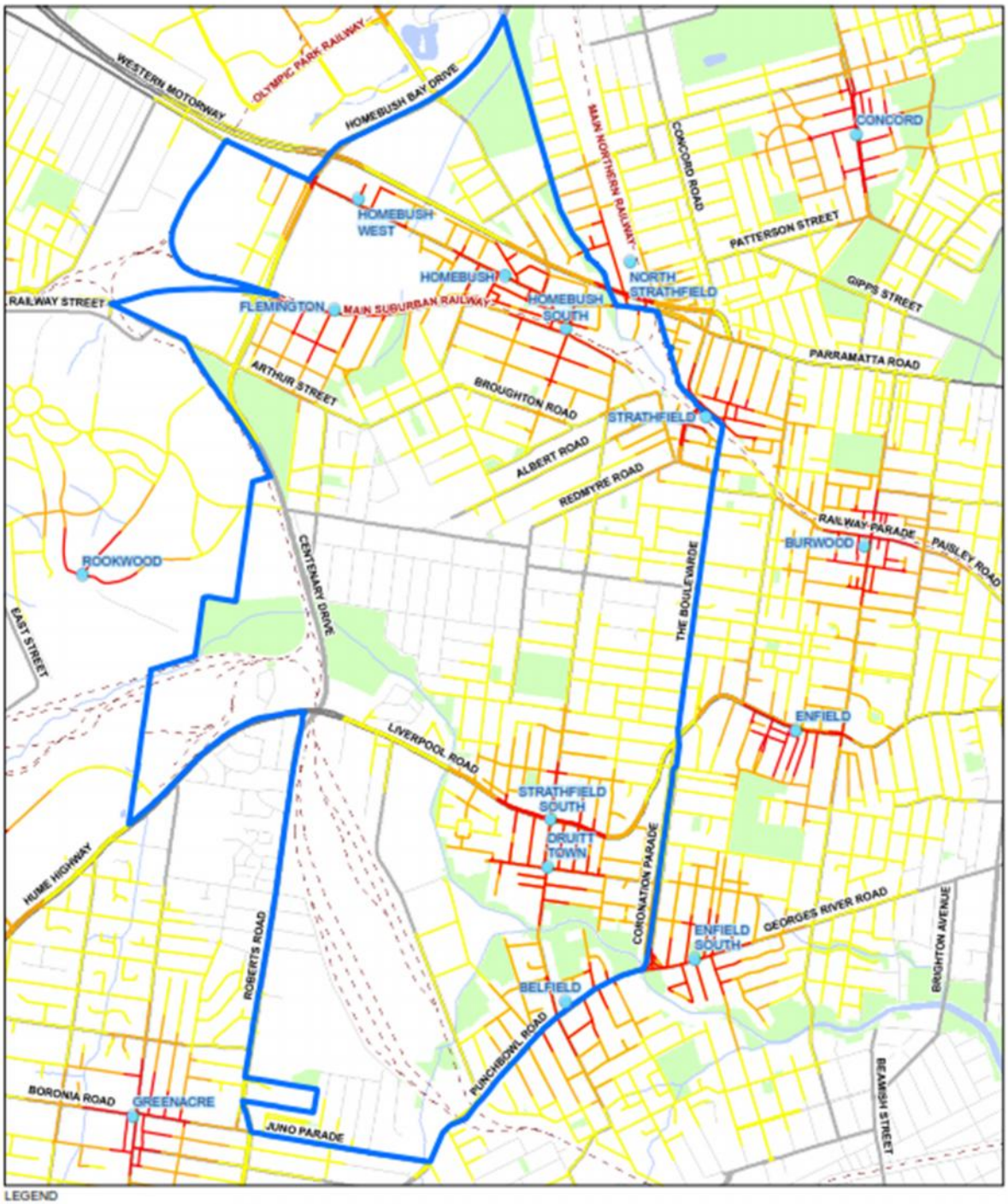
Regards

Geoff Ashton
Secretary Canada Bay Bicycle Users Group
secretary@baybug.org.au
0407006874

Appendix C Walking and Bike Riding Catchments




OLYMPIC PARK RAILWAY
HOMEBUSH BAY DRIVE
WESTERN MOTORWAY
PARRAMATTA ROAD
MAIN NORTHERN RAILWAY
CONCORD ROAD
PATTERSON STREET
GIPPS STREET
MAIN SUBURBAN RAILWAY
ARTHUR STREET
BROUGHTON ROAD
ALBERT ROAD
RAILWAY PARADE
PAISLEY ROAD
CENTENARY DRIVE
LIVERPOOL ROAD
HUME HIGHWAY
ROBERTS ROAD
CORONATION PARADE
PUNCHBOWL ROAD
BORONIA ROAD
JUNO PARADE
Schools
1, Homebush Boys High
2, Homebush West Public
3, Homebush Primary
4, Strathfield Girls High
5, St Patrick College
6, Meriden Anglican
7, Santa Maria Del Monte
8, Meriden Anglican
9, Chalmers Rd Public School
10, Trinity Grammar Prep.
11, Strathfield South High
12, Strathfield South Primary
13,
14, St Dominics Catholic School
15, St Patrick College
16, St Annes Catholic School
17, St Marthas Cath. Girls School
18, SDA College
LEGEND
Study area
Schools
5 minute cycle at 10km/h
10 minute cycle at 10km/h
20 minute cycle at 10km/h
Waterbody
Open space
Railway
Waterways
Highways
Major roads
Minor roads
Paper Size A4
0 200 400 800
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56
N
Strathfield Council
Strathfield Active Travel Plan
5 Minute, 10 Minute and 20 Minute
Bike Riding Catchment – Schools
Job Number 21-25232
Revision A
Date 18 Oct 2016
Figure 10-2
Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmail@ghd.com.au W www.ghd.com.au
Data source: General Topo - NSW LPI DTDB 2012 & Strathfield Council, Zoning data - SILEP LZN, Cycle data - Strathfield Council. Created by:tchardson



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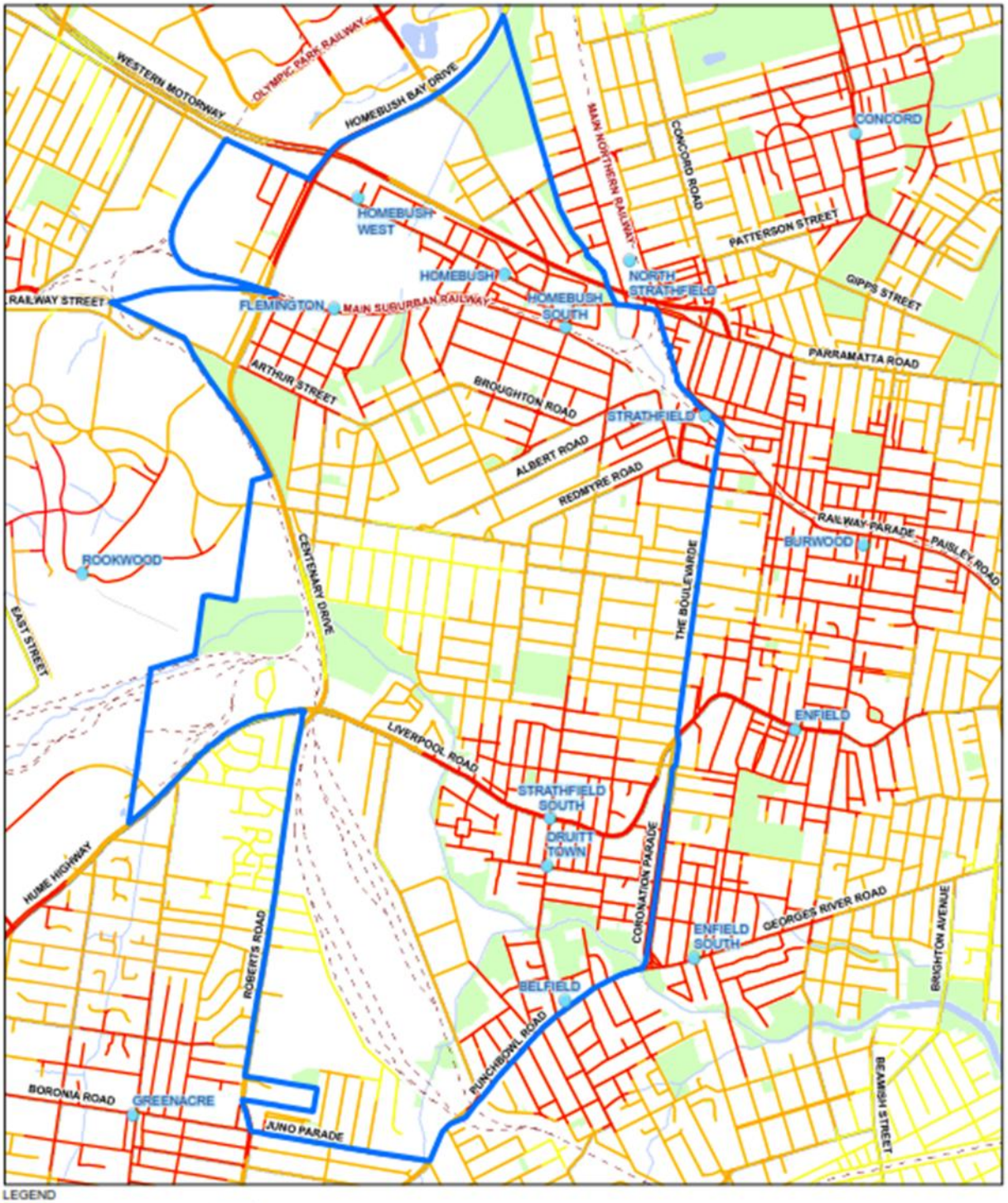
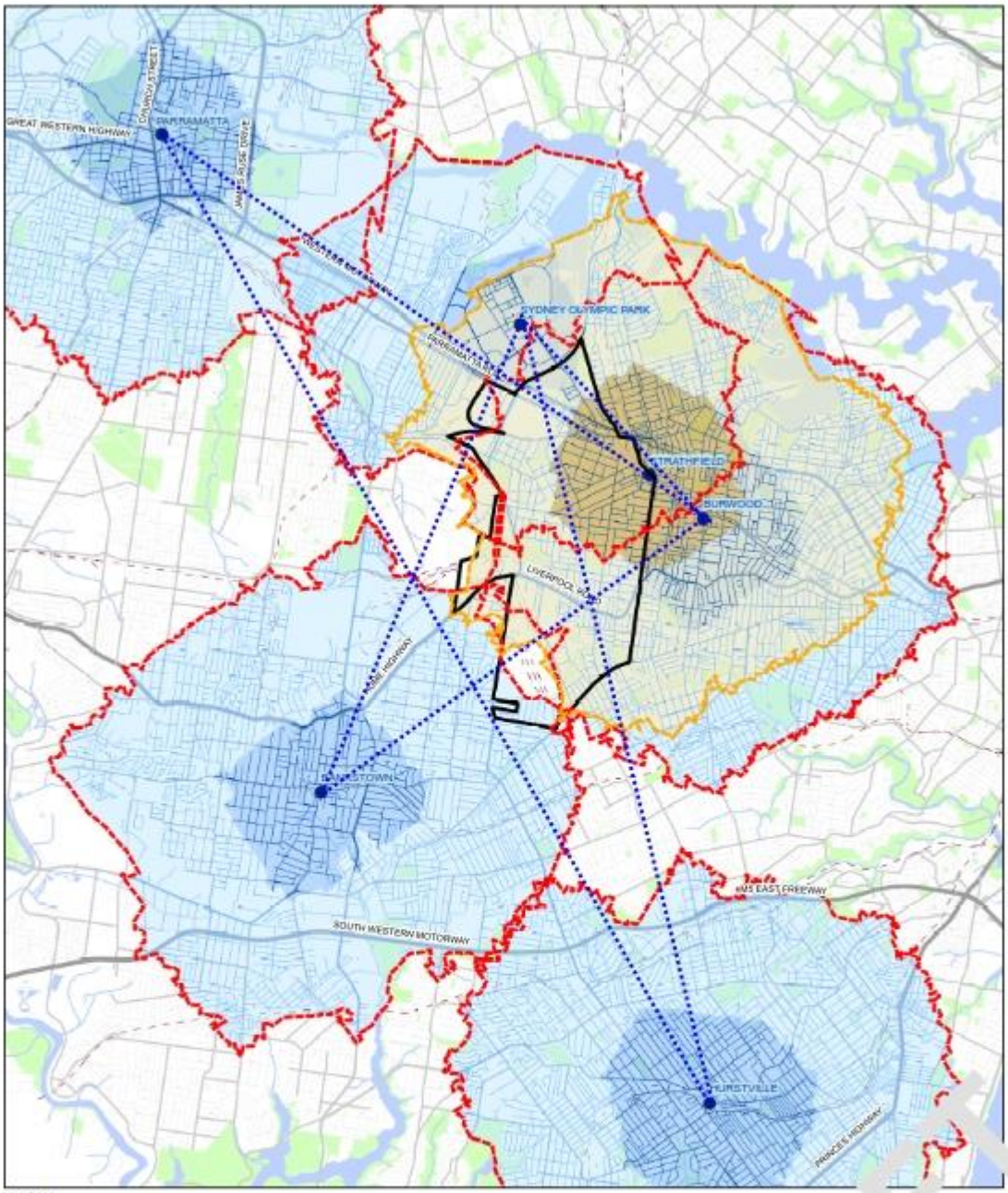

WESTERN MOTORWAY
OLYMPIC PARK RAILWAY
HOMEBUSH BAY DRIVE
MAIN NORTHERN RAILWAY
CONCORD ROAD
CONCORD
PATTERSON STREET
HOMEBUSH WEST
HOMEBUSH
NORTH STRATHFIELD
GIPPS STREET
RAILWAY STREET
FLEMINGTON
MAIN SUBURBAN RAILWAY
HOMEBUSH SOUTH
PARRAMATTA ROAD
ARTHUR STREET
BROUGHTON ROAD
STRATHFIELD
ALBERT ROAD
REDMYRE ROAD
RAILWAY PARADE
PAISLEY ROAD
BURWOOD
ROOKWOOD
CENTENARY DRIVE
THE BOULEVARDE
EAST STREET
ENFIELD
LIVERPOOL ROAD
STRATHFIELD SOUTH
DRUITT TOWN
HUME HIGHWAY
CORONATION PARADE
GEORGES RIVER ROAD
ENFIELD SOUTH
BRIGHTON AVENUE
ROBERTS ROAD
BELFIELD
PUNCHBOWL ROAD
BEAMISH STREET
BORONIA ROAD
GREENACRE
JUNO PARADE
LEGEND
Study area
Local centres
5 minute cycle at 10km/h
10 minute cycle at 10km/h
20 minute cycle at 10km/h
Waterbody
Open space
Railway
Waterways
Highways
Major roads
Minor roads
Paper Size A4
0 200 400 800
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56
N
Strathfield Council
Strathfield Active Travel Plan
Job Number 21-25232
Revision A
Date 18 Oct 2016
5 Minute, 10 Minute and 20 Minute
Bike Riding Catchment – Local Centres
Figure 10-4
Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmail@ghd.com.au W www.ghd.com.au
Data source: General Topo - NSW LPI DTDB 2012 & Strathfield Council, Zoning data - SILEP LZN, Cycle data - Strathfield Council. Created by:jrichardson



LEGEND

Study area
Key centres
All other catchment areas
Strathfield catchment area
2km walking catchment
5km cycling catchment
Waterbody
Open space
Railway
Waterways
Highways
Major roads
Minor roads

Paper Size A4
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Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

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Strathfield Council
Strathfield Active Travel Plan

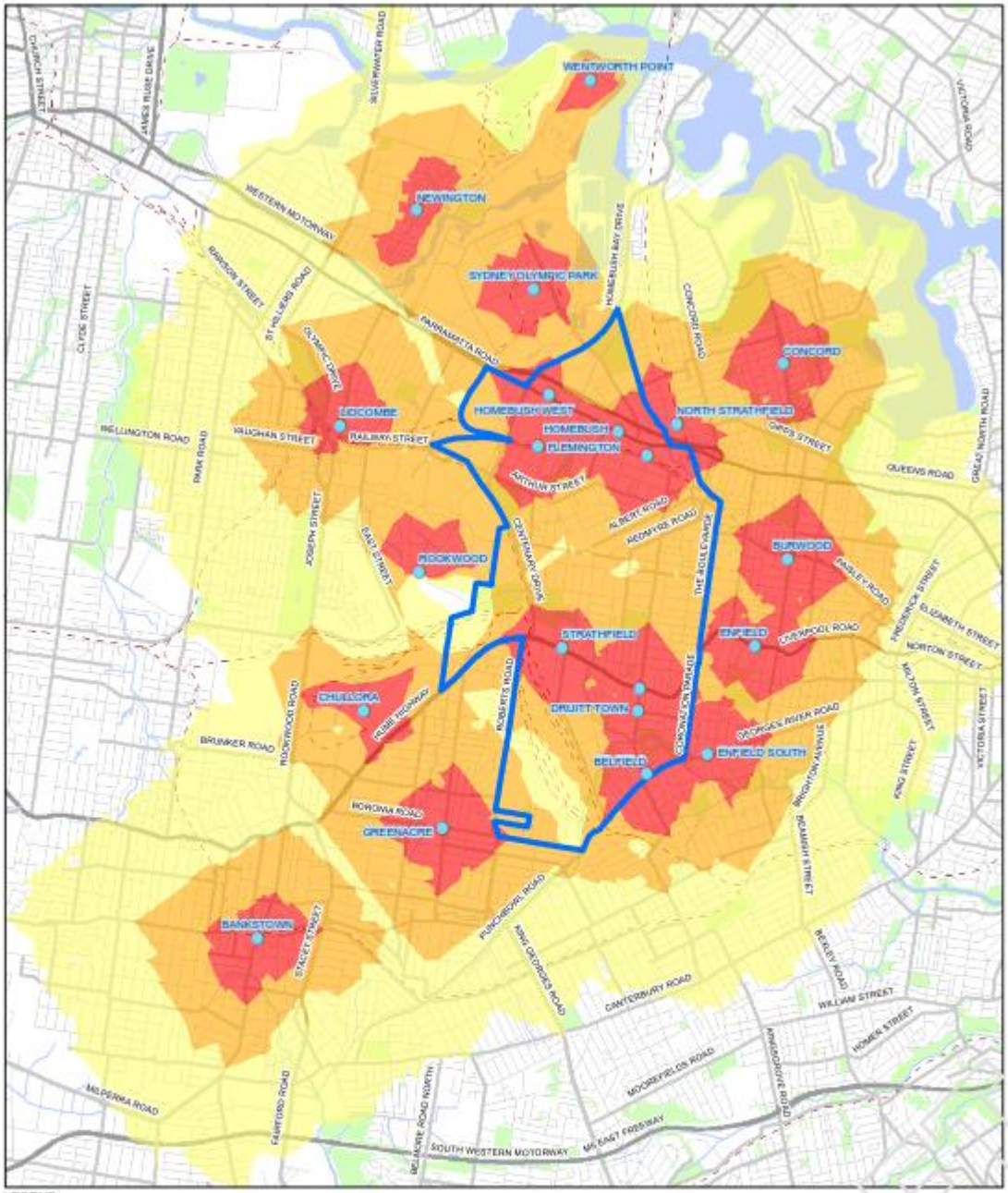
Cycling catchm[illegible] pla[illegible]
Sydney Olym[illegible] Park - S[illegible]athfield - Burwood

Figure 7

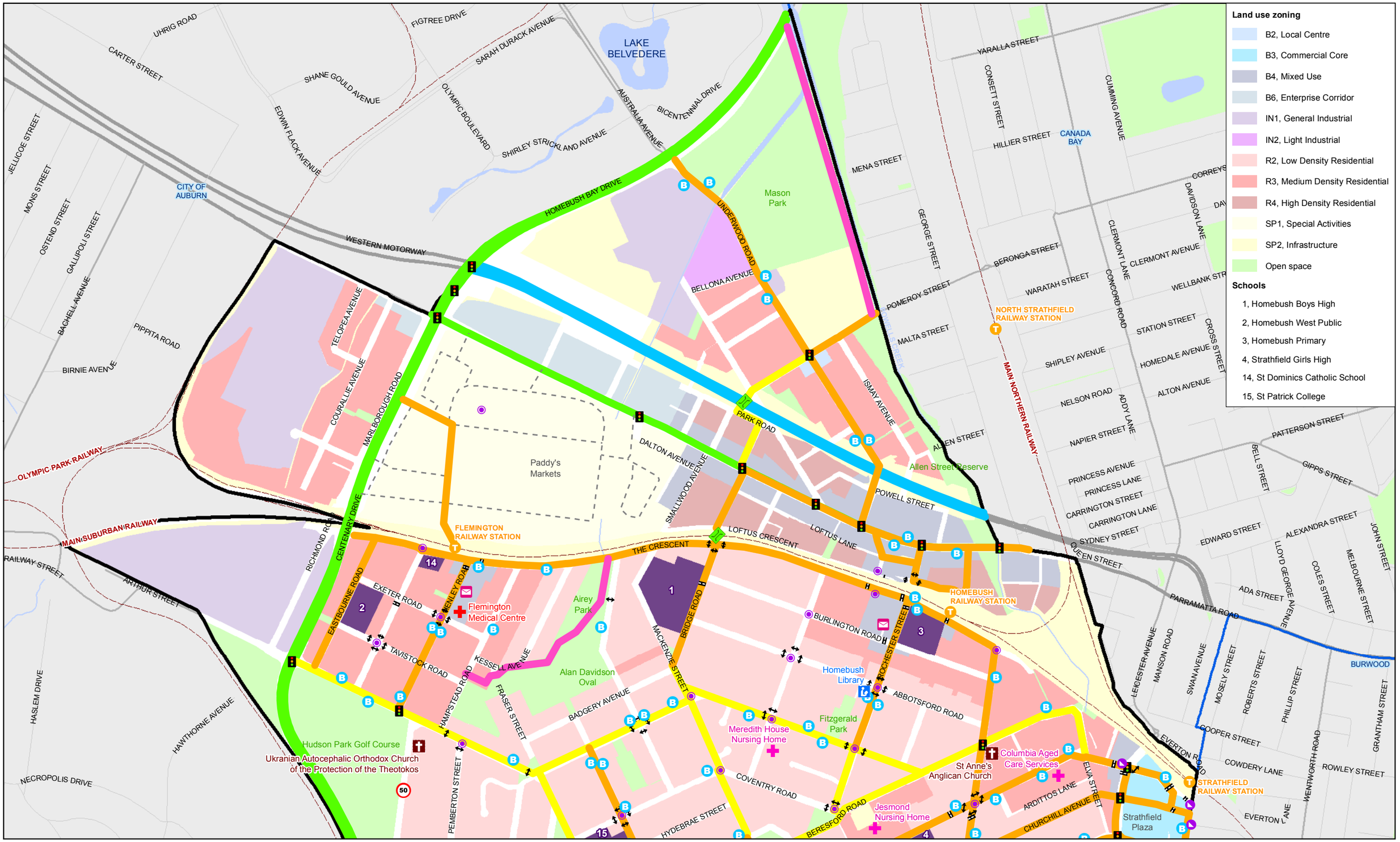
Job Number | 21-25232
Revision | A
Date | 03 May 2016

\\ghdnet\ghd\AU\Sydney\Projects\21\25232\GIS\Maps\Deliverables\21_25232_Z007_ExtendedWalkingCatchment.mxd 133 Castlereagh Street Sydney NSW 200[illegible] 2 9239 71[illegible] 61 2 9239 7199 E sydmail@ghd.com.au W www.ghd.com.au

Data source: General Topo - NSW LPI DTDB 2012 & Strathfield Council; Zoning data - SILEP LZN, Cycle data - Strathfield Council. Created by sdgarcia


WENTWORTH POINT
NEWINGTON
SYDNEY OLYMPIC PARK
CONCORD
HOMEBUSH WEST
HOMEBUSH
FLEMINGTON
NORTH STRATHFIELD
LIDCOMBE
RAILWAY STREET
ARTHUR STREET
ROCKWOOD
BURWOOD
STRATHFIELD
ENFIELD
CHULLORA
DRUITT TOWN
ENFIELD SOUTH
BELFIELD
GREENACRE
BANKSTOWN
WESTERN MOTORWAY
PARRAMATTA ROAD
CONCORD ROAD
QUEENS ROAD
LIVERPOOL ROAD
CANTERBURY ROAD
SOUTH WESTERN MOTORWAY
M5 EAST FREEWAY
LEGEND
Study area
Local centres
5 minute cycle at 10km/h
10 minute cycle at 10km/h
20 minute cycle at 10km/h
Waterbody
Open space
Railway
Waterways
Highways
Major roads
Minor roads
Paper Size A4
Strathfield Council
Strathfield Active Travel Plan
Cycling catchment plan
Sydney Olympic Park - Bankstown - Burwood
Figure 7
Job Number 21-25232
Revision A
Date 18 Apr 2016
DRAFT

Appendix D Proposed Walking and Bicycle Networks



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Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N

LEGEND

- Study area
- LGA boundary
- Schools
- Aged care
- Church
- Library
- Medical centre
- Post Office
- Kerb ramp
- Bridge/overpass
- Bus stop
- Roundabout
- Signalled intersection
- Speed
- Pedestrian refuge
- Zebra crossing
- Motorway standard road
- Route of national significance
- Railway
- Priority walking routes
- Secondary walking routes
- Paddy's Markets pedestrian network
- Day time Network - Shared Path

Strathfield Council
Strathfield Active Travel Plan

Job Number 21-25232
Revision A
Date 19 Oct 2016

Existing Walking Infrastructure and Proposed Primary and Secondary Walking Routes

Figure 12-2

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Level 15, 133 Castlereagh Street Sydney NSW 2000 **T** 61 2 9239 7100 **F** 61 2 9239 7199 **E** sydmail@ghd.com.au **W** www.ghd.com.au

Data source: General Topo - NSW LPI DTDB 2012 & Strathfield Council, Zoning data - SILEP LZN, Cycle data - Strathfield Council. Created by:jrichardson

Land use zoning

- B1, Neighbourhood Centre
- B2, Local Centre
- B3, Commercial Core
- B4, Mixed Use
- B6, Enterprise Corridor
- IN1, General Industrial
- R2, Low Density Residential
- R3, Medium Density Residential
- SP2, Infrastructure
- Open space

Schools

4, Strathfield Girls High
5, St Patrick College
6, Meriden Anglican
7, Santa Maria Del Monte
8, Meriden Anglican
9, Chalmers Rd Public School
10, Trinity Grammar Prep.
11, Strathfield South High
12, Strathfield South Primary
13, Strathfiled South Public School
15, St Patrick College
16, St Annes Catholic School
17, St Marthas Cath. Girls School
18, SDA College
19, Australian International Academy

Paper Size A3

0 100 200 400

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N

LEGEND

- Study area
- LGA boundary
- Schools
- Aged care
- Church
- Library
- Medical centre
- Post Office
- Kerb ramp
- Bridge/overpass
- Bus stop
- Roundabout
- Signalled intersection
- Speed
- Pedestrian refuge
- Zebra crossing
- Motorway standard road
- Route of national significance
- Railway
- Priority walking routes
- Secondary walking routes
- Day time Network - Shared Path

Strathfield Council
Strathfield Active Travel Plan

Job Number 21-25232
Revision A
Date 19 Oct 2016

Existing Walking Infrastructure and Proposed Primary and Secondary Walking Routes

Figure 12-3

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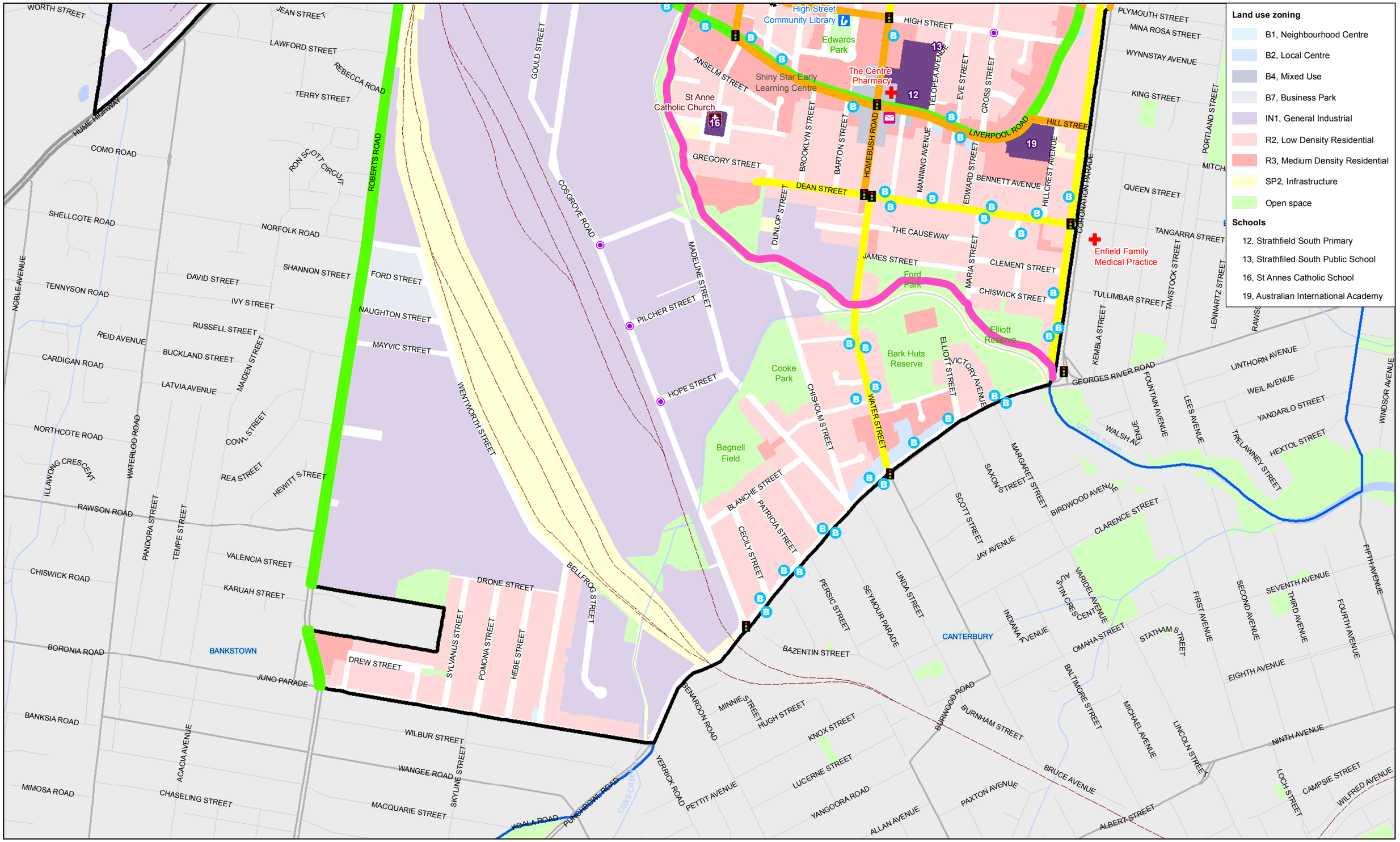
Level 15, 133 Castlereagh Street Sydney NSW 2000 **T** 61 2 9239 7100 **F** 61 2 9239 7199 **E** sydmail@ghd.com.au **W** www.ghd.com.au

Data source: General Topo - NSW LPI DTDB 2012 & Strathfield Council, Zoning data - SILEP LZN, Cycle data - Strathfield Council. Created by:jrichardson



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Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N

LEGEND

- Study area
- LGA boundary
- Schools
- Aged care
- Church
- Library
- Medical centre
- Post Office
- Kerb ramp
- Bridge/overpass
- Bus stop
- Roundabout
- Signalled intersection
- Speed
- Pedestrian refuge
- Zebra crossing
- Motorway standard road
- Route of national significance
- Railway
- Priority walking routes
- Secondary walking routes
- Day time Network - Shared Path

Strathfield Council
Strathfield Active Travel Plan

Job Number 21-25232
Revision A
Date 19 Oct 2016

Existing Walking Infrastructure and Proposed Primary and Secondary Walking Routes

Figure 12-4

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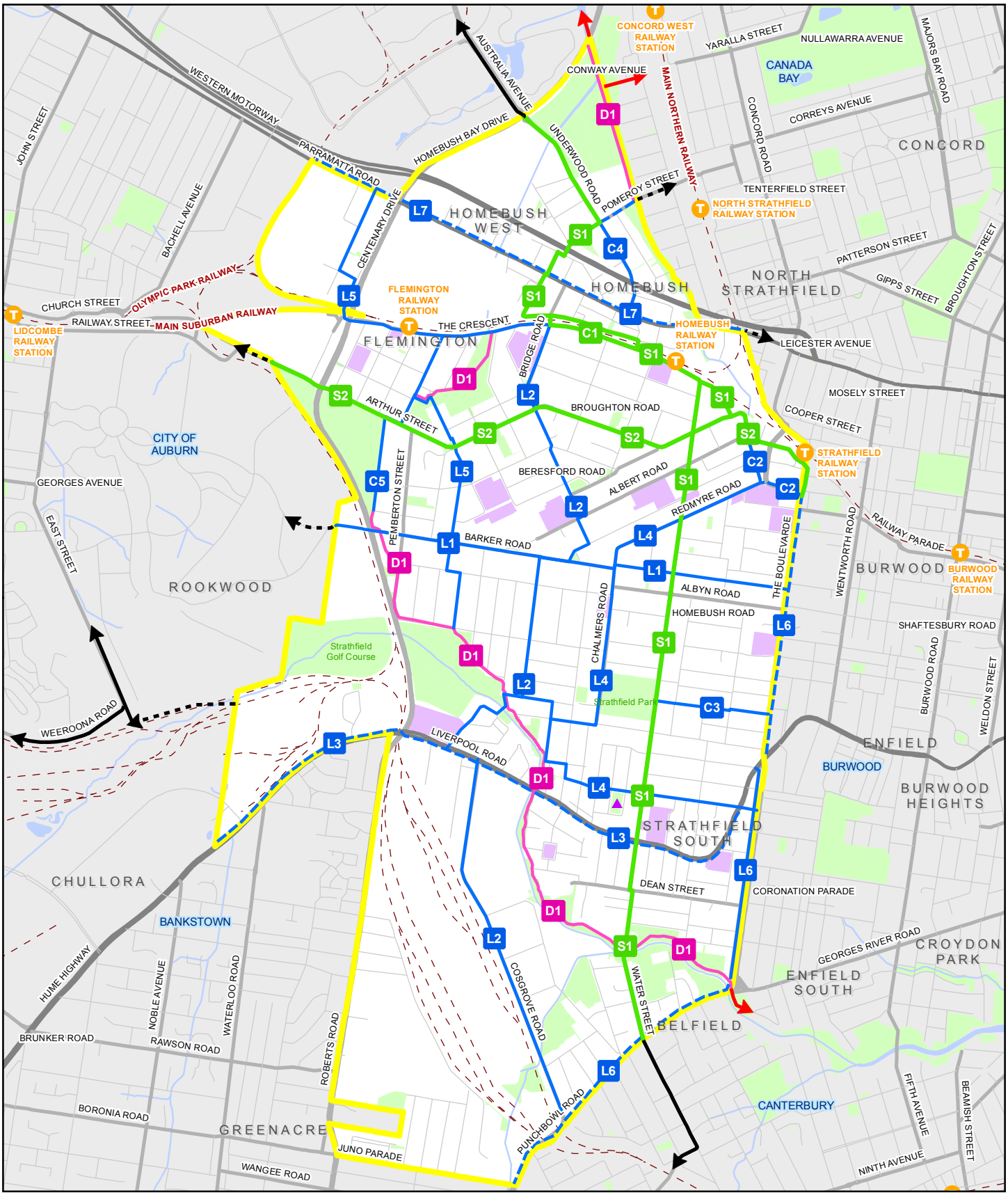
Level 15, 133 Castlereagh Street Sydney NSW 2000 **T** 61 2 9239 7100 **F** 61 2 9239 7199 **E** sydmail@ghd.com.au **W** www.ghd.com.au

Data source: General Topo - NSW LPI DTDB 2012 & Strathfield Council, Zoning data - SILEP LZN, Cycle data - Strathfield Council. Created by:jrichardson



LEGEND

- Study area
- Schools
- Open space
- High Street Community Library
- Train station
- Railway
- Highways
- Major roads
- Minor roads
- Strategic Network - Separated Cycleway
- Local Network - Shared Path
- Local Network - On Road
- Day time Network - Shared Path

Connections to neighbouring LGAs

- Existing on road
- Existing shared path
- Proposed on road

Paper Size A4

0 200 400 800

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

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Strathfield Council
Strathfield Active Travel Plan

Job Number 21-25232
Revision A
Date 18 Oct 2016

Proposed Bicycle Network

Figure 12-1

Data source: General Topo - NSW LPI DTDB 2012 & Strathfield Council, Zoning data - SILEP LZN, Cycle data - Strathfield Council. Created by:jrichardson

Appendix E Wayfinding Strategy

AT-Strathfield
An Active Travel Plan for Strathfield

Stage 1 Audit Review

A1 100% | 14 OCTOBER 2016

Urban&Public | ASPECT Studios™

AT - STRATHFIELD		Project	Prepared by				SIGN NO	INTRODUCTION
A1 **100%**	14 OCT 2016	NOTE						

INTRODUCTION / STRATEGY

The Strathfield LGA is within proximity of Sydney's foremost cycle networks — the Cooks River Path, Sydney Olympic Park and Bicentennial Parkland bike circuits, and the Parramatta Valley Cycleway. As a result, linking these cycle paths within the LGA is the focus of this wayfinding strategy.

Accordingly, these cycle networks are the primary destinations across this wayfinding collection. These networks will also allows for greater destination selection as these paths lead to its surrounding suburbs such as;

Sydney Olympic Park & Bicentennial Parkland
Rhodes, Concord West, North Strathfield

Parramatta Valley Cycleway
Meadowbank, Ryde, Gladesville, Parramatta

Cooks River Path
Strathfield, Dulwich Hill & Botany Bay.

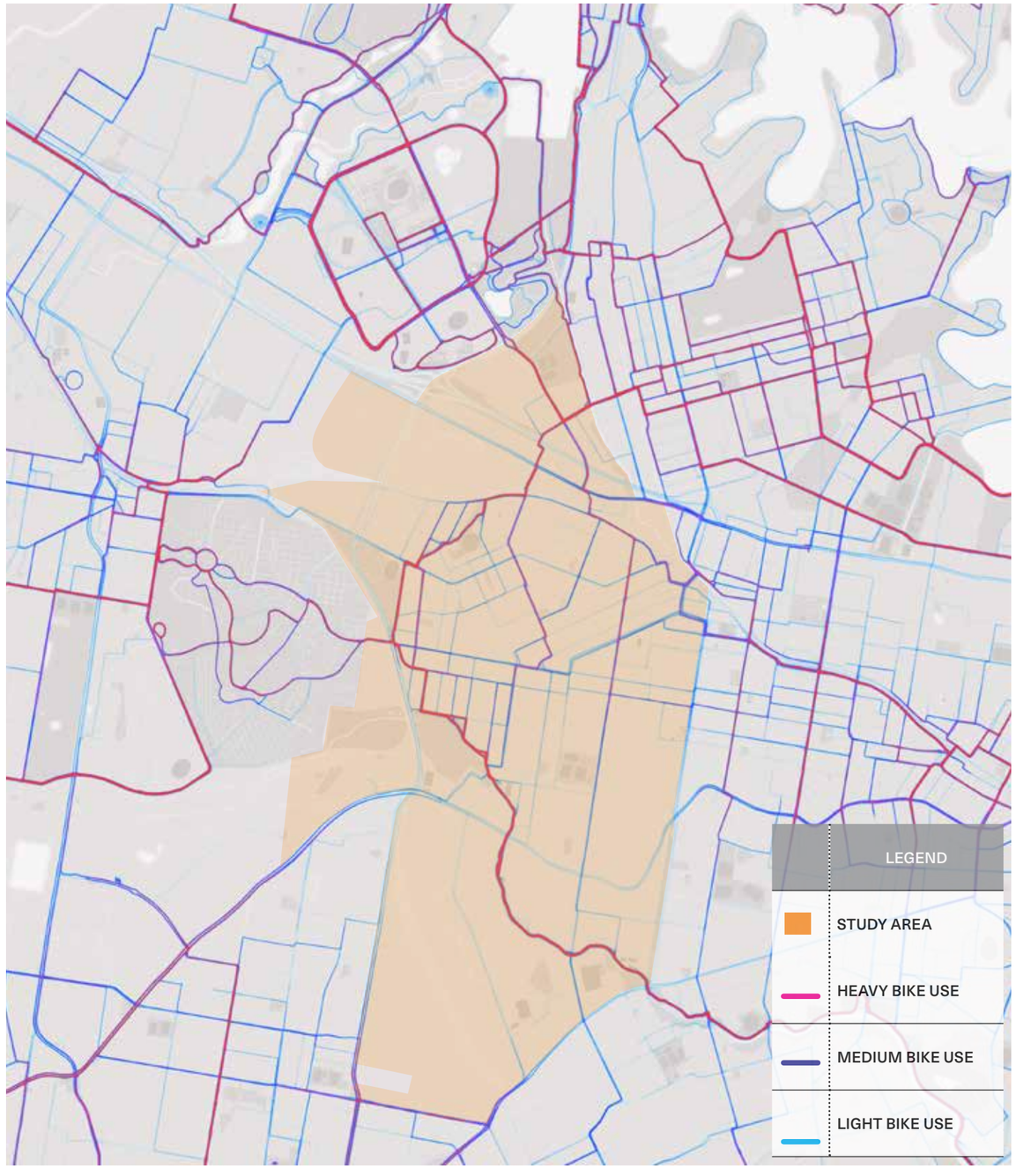
These established networks have existing bike signages that lead to their encompassing areas, as well as into the Strathfield LGA. Thus, destination preferences for the new wayfinding roll out are executed accordingly to boundary LGA signs for destination and travel consistency between LGA bike networks.

On strategic bike paths network signs have been located at key cycleway points, generally at separated and local/ shared network path intersections to navigate cyclists towards town centres and train stations.

Trains are the single mode of public transport accessible by bike, thus ttrain stations are used substantially in the strategy. Also, where possible, train station localities double for town centre destinations, simplifying sign messaging from the standard 'Flemington Town Centre' to 'Flemington T'.

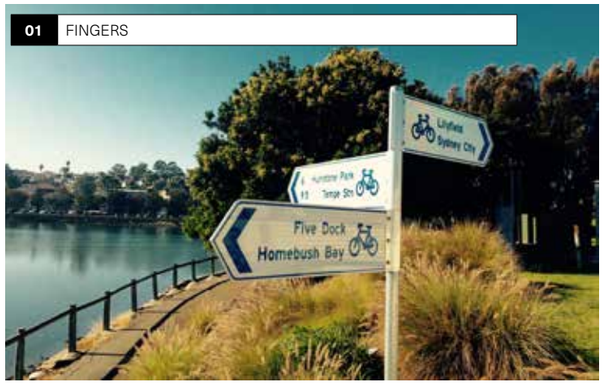
AT - STRATHFIELD		Project	Prepared by				SIGN NO	CYCLE NETWORK
A1 **100%**	14 OCT 2016	NOTE						

CYCLE NETWORK / HEAT MAP



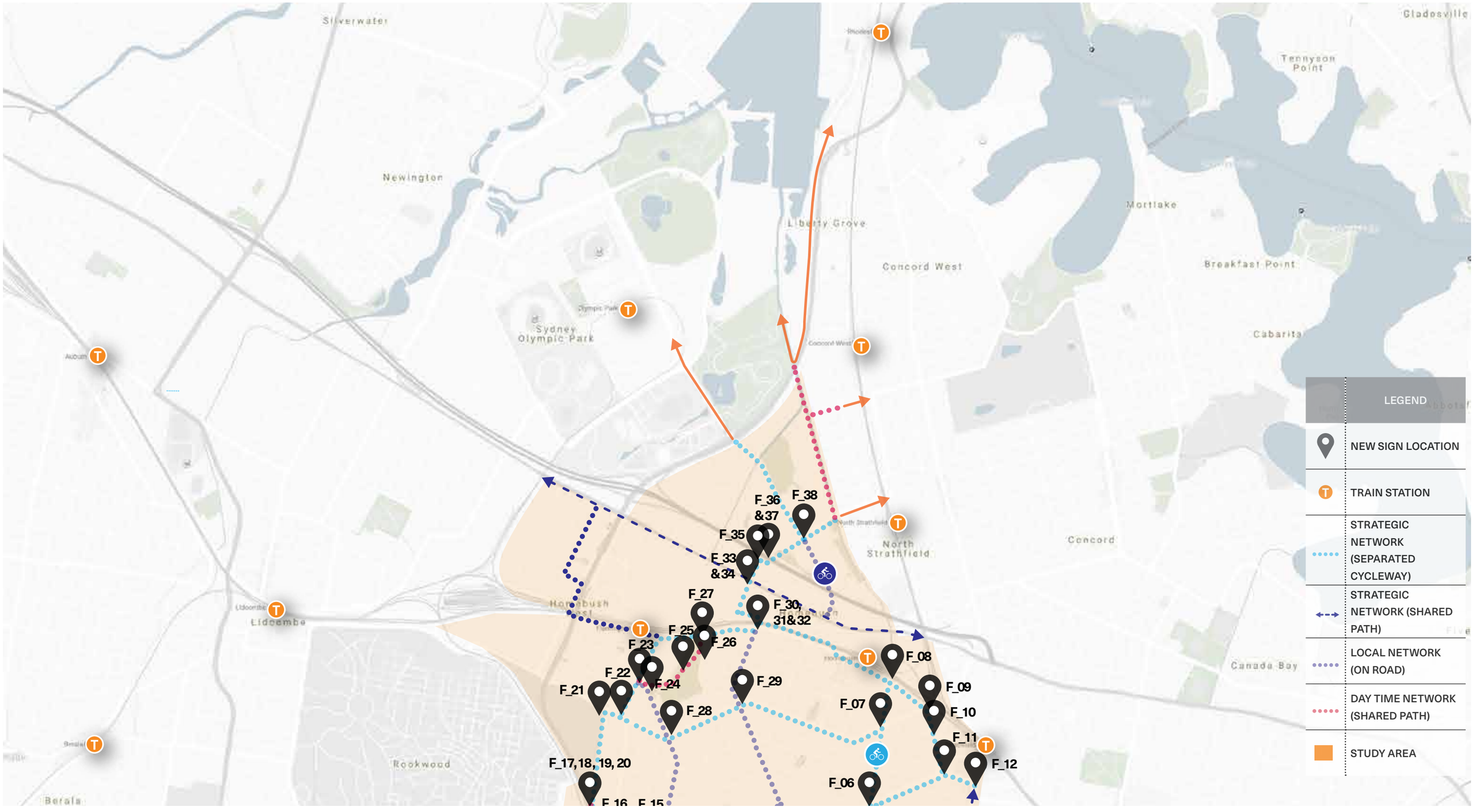
PROPOSED SIGN TYPOLOGY

01 FINGERS



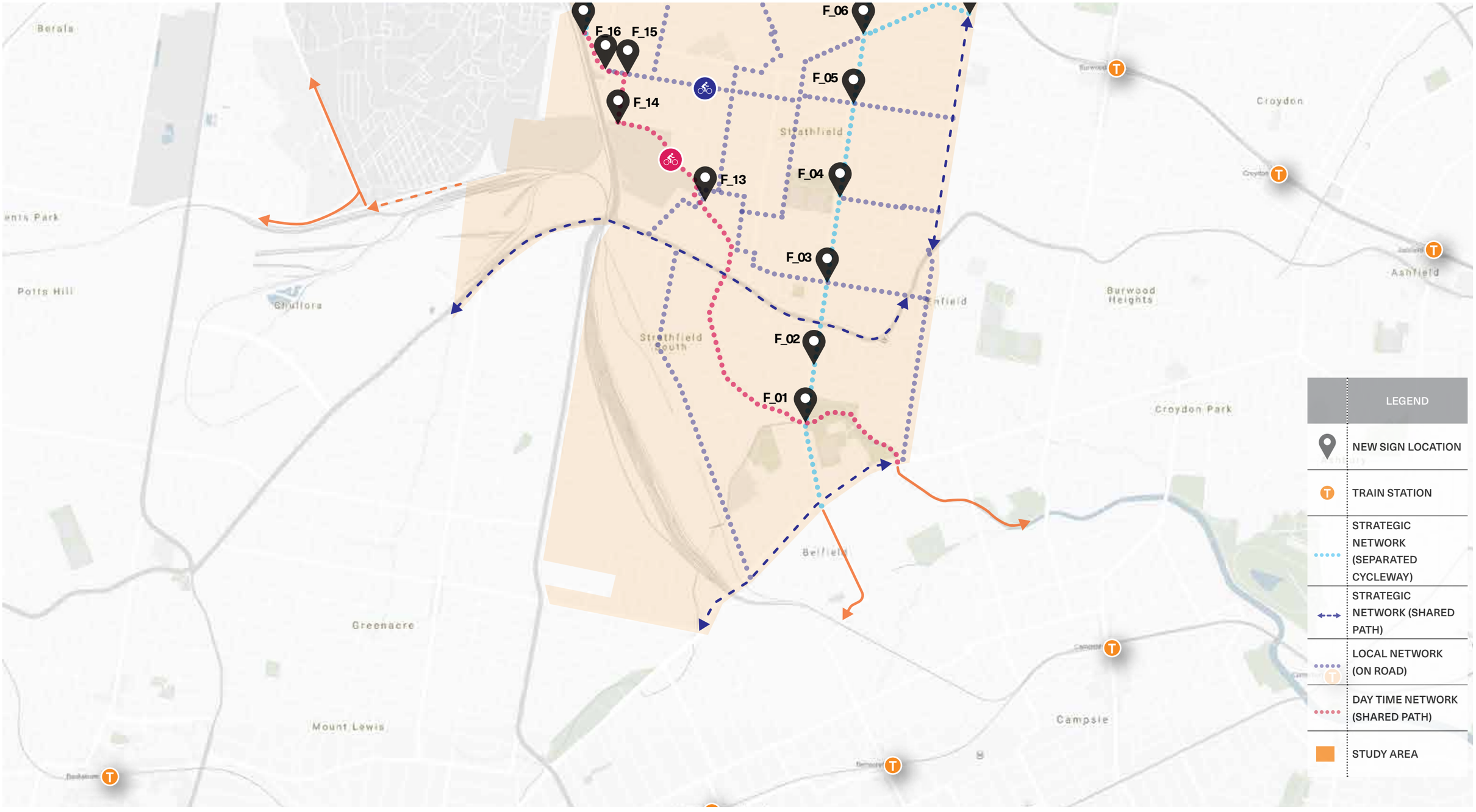
STRATHFIELD LGA ACTIVE TRANSPORT PLAN		Project	Prepared by				SIGN NO	LOCATION OF SIGNS
A1 (DRAFT 90%)	16 SEPT 2016	NOTE						

LOCATION MAP



AT - STRATHFIELD		Project	Prepared by				SIGN NO	LOCATION OF SIGNS
A1 **100%**	14 OCT 2016	NOTE						

INTODUCTION



AT - STRATHFIELD		Project	Prepared by URBAN&PUBLIC				SIGN NO	SCHEDULE OF SIGNS
A1 **100%**	14 OCT 2016	NOTE						

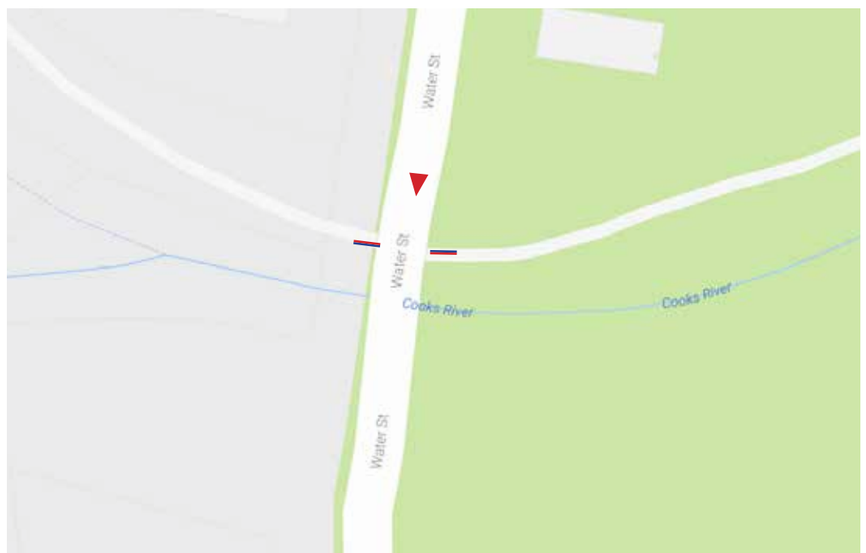
SCHEDULE		TOTAL: 38
Sign Number	**Main Road/Street Route**	**Cross Road /Street**
F_01	Water Street	Cooks River Path
F_02	Water Street	Dean Street
F_03	Homebush Road	High Street
F_04	Homebush Road	Fairholm Street
F_05	Homebush Road	Elwin Street
F_06	Homebush Road	Redmyre Road
F_07	Homebush Road	Beresford Road
F_08	Homebush Road	The Crescent
F_09	The Crescent	
F_10	Beresford Road	
F_11	Redmyre Road	Raw Square
F_12	Redmyre Road	The Boulevarde
F_13	Augusta Street	Morgan Place
F_14	Ada Avenue	Melville Avenue
F_15	Melville Avenue	Newton Road
F_16	Newton Road	Pemberton Street
F_17	Newton Road	Barker Street
F_18	Barker Street	
F_19	Centenary Drive	
F_20	Mitchell Road	Kurah Street
F_21	Mitchell Street	Arthur Street
F_22	Arthur Street	Hampstead Road
F_23	Hampstead Road	
F_24	Fraser Street	
F_25	Airey Street	
F_26	Bates Street	
F_27	Bates Street	The Crescent
F_28	Arthur Street	Fraser Street

SCHEDULE (CONT)		
Sign Number	**Main Road/Street**	**Cross Road /Street**
F_29	Broughton Road	MacKenzie Street
F_30	Bridge Road	The Crescent
F_31	Bridge Road	Loftus Crescent
F_32	Floftus Crescent	Bridge Road
F_33	Smallwood Avenue	Parramatta Road
F_34	Derowie Avenue	Parramatta Road
F_35	Park Road	Derowie Avenue
F_36	Park Road	West. Motor. Foot.
F_37	Pomeroy Street	West. Motor. Foot.
F_38	Pomeroy Street	Underwood Road

AT - STRATHFIELD		Project	Prepared by URBAN&PUBLIC	SIGNAGE LOCATION		SIGN NO	F_01A+B
A1 **100%**	14 OCT 2016	NOTE		ADDRESS	WATER STREET & COOKS RIVER PATH	FILENAME	**F_01.AI**

01 STREET VIEW

02 SITE PLAN



03 LEGEND | FINGER SIGN | SIDE A OF SIGN | SIDE B OF SIGN | STREET VIEWPOINT LOCATION

04 SCHEDULE

	DESTINATION (south face)	TIME	DIST
↑	Homebush (T)	14	3.5km
	Strathfield (T)	15	3.5km
	Burwood (T)	14	4.3km
←	Cooks River Path		
	Botany Bay	1h	16.8km
→	Cooks River Path		
	Dean Reserve	1	400m
	Rookwood	13	3.9km

	DESTINATION (north face)	TIME	DIST
↑	Belmore (T)	10	3km
←	Cooks River Path		
	Botany Bay	1h	16.8km
→	Cooks River Path		
	Dean Reserve	1	400m
	Rookwood	13	3.9km

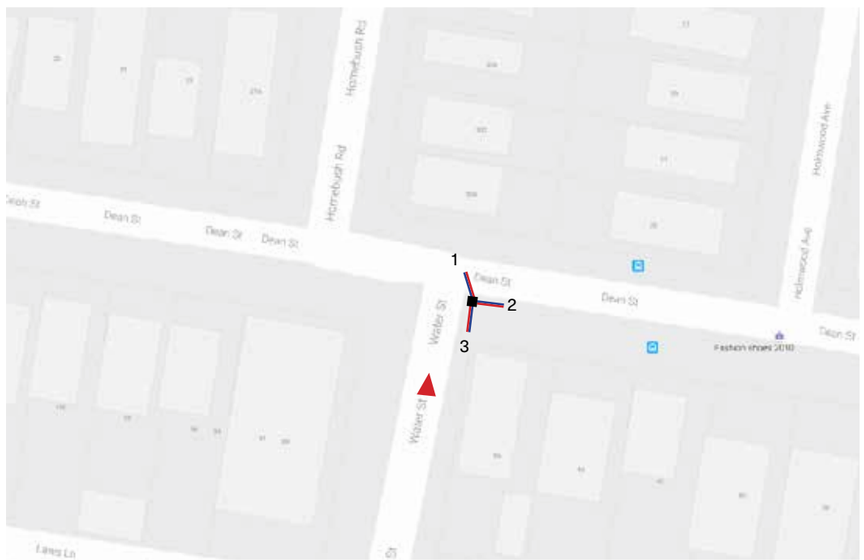
05 EXISTING SIGN SCHEDULE

FINGER		DESTINATION	TIME	DIST
RMS_01 | 01	←	Cooks River Path		
		Botany Bay		
RMS_01 | 02	→	Cooks River Path		
		Dean Reserve		

AT - STRATHFIELD		Project	Prepared by URBAN&PUBLIC	SIGNAGE LOCATION		SIGN NO	F_02
A1 **100%**	14 OCT 2016	NOTE		ADDRESS	CNR WATER STREET & DEAN STREET	FILENAME	**F_02.AI**

01 STREET VIEW

02 SITE PLAN



03 LEGEND | FINGER SIGN | SIDE A OF SIGN | SIDE B OF SIGN | STREET VIEWPOINT LOCATION

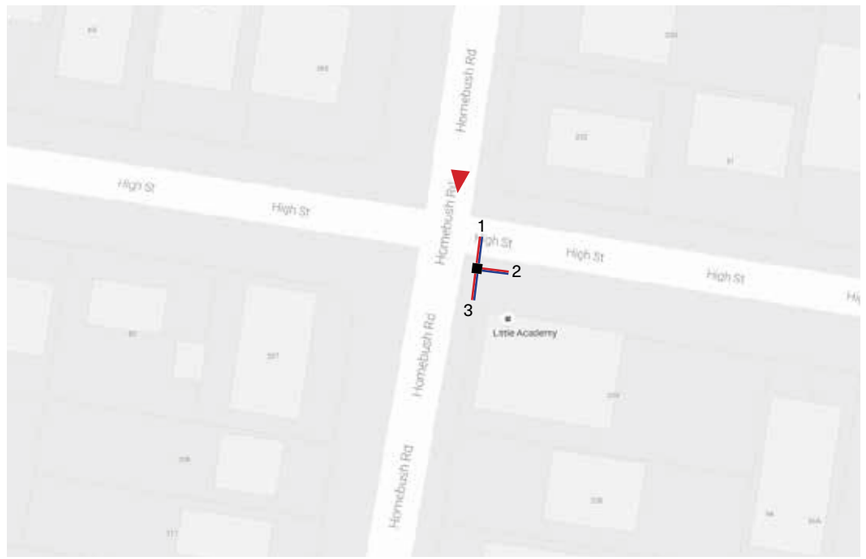
04 SCHEDULE

FINGER		DESTINATION	TIME	DIST
1A	←	Homebush T	12	3.2km
		Strathfield T	13	3.2km
2A	←	Burwood T	14	3.7km
3A	←	Cooks River Path	2	350

AT - STRATHFIELD		Project	Prepared by URBAN&PUBLIC	**SIGNAGE LOCATION**		SIGN NO	**F_03**
A1 **100%**	14 OCT 2016	NOTE		ADDRESS	CNR HOMEBUSH ROAD & HIGH STREET	FILENAME	**F_03.AI**

01 STREET VIEW

02 SITE PLAN



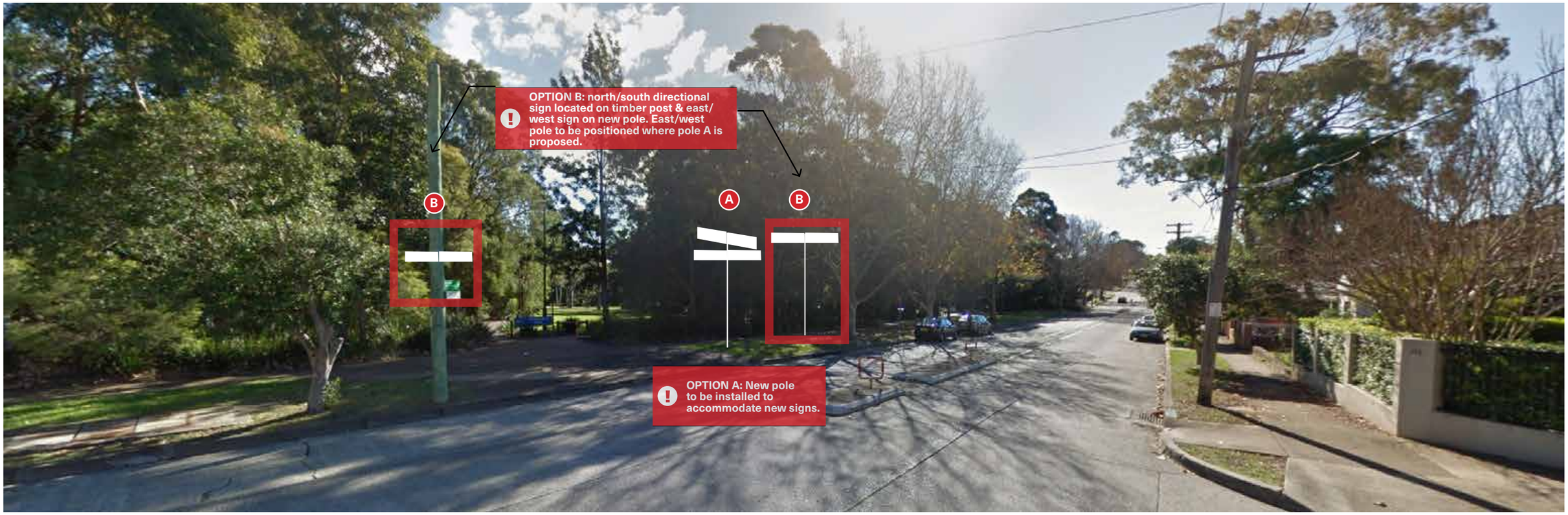
03 LEGEND | FINGER SIGN — SIDE A OF SIGN — SIDE B OF SIGN ▲ STREET VIEWPOINT LOCATION

04 SCHEDULE

FINGER		DESTINATION	TIME	DIST
1A	←	Homebush (T)	9	2.6km
		Strathfield (T)	10	2.6km
2A	←	Burwood (T)	11	3km
3A	←	South Strathfield	1	290
		Cooks River Path	5	950

AT - STRATHFIELD		Project	Prepared by	SIGNAGE LOCATION		SIGN NO	F_04
A1 **100%**	14 OCT 2016	NOTE	URBAN&PUBLIC	ADDRESS	HOMEBUSH ROAD & FAIRHOLM STREET	FILENAME	**F_04.AI**

01 STREET VIEW



02 SITE PLAN

03 LEGEND | FINGER SIGN | SIDE A OF SIGN | SIDE B OF SIGN | STREET VIEWPOINT LOCATION

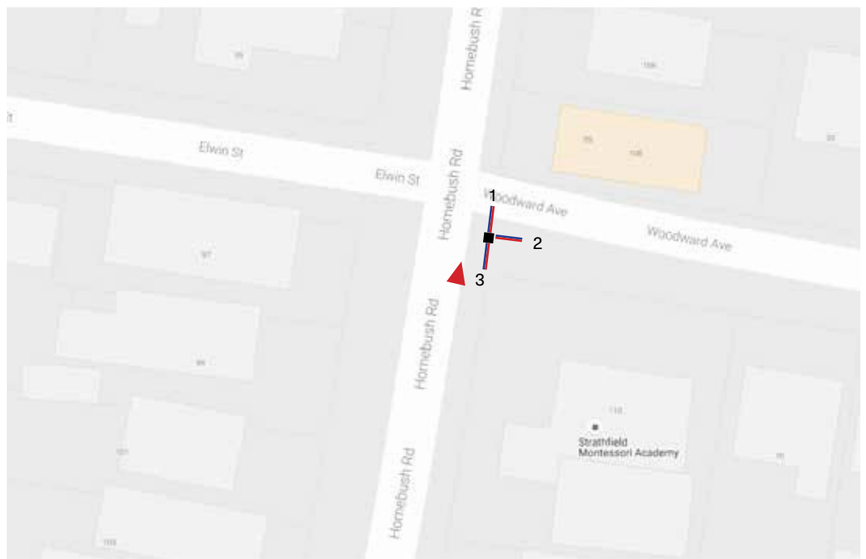
04 SCHEDULE

FINGER		DESTINATION	TIME	DIST
1A	←	Homebush (T)	7	2.1km
		Strathfield (T)	8	2.1km
2A	←	Burwood (T)	10	2.7km
3A	←	South Strathfield	3	800
		Cooks River Path	6	1.5km
4A	←	Strathfield Park		

AT - STRATHFIELD		Project	Prepared by URBAN&PUBLIC	SIGNAGE LOCATION		SIGN NO	F_05
A1 **100%**	14 OCT 2016	NOTE		ADDRESS	CNR HOMEBUSH ROAD & ELWIN STREET	FILENAME	**F_05.AI**

01 STREET VIEW

02 SITE PLAN



03 LEGEND | FINGER SIGN | SIDE A OF SIGN | SIDE B OF SIGN | STREET VIEWPOINT LOCATION

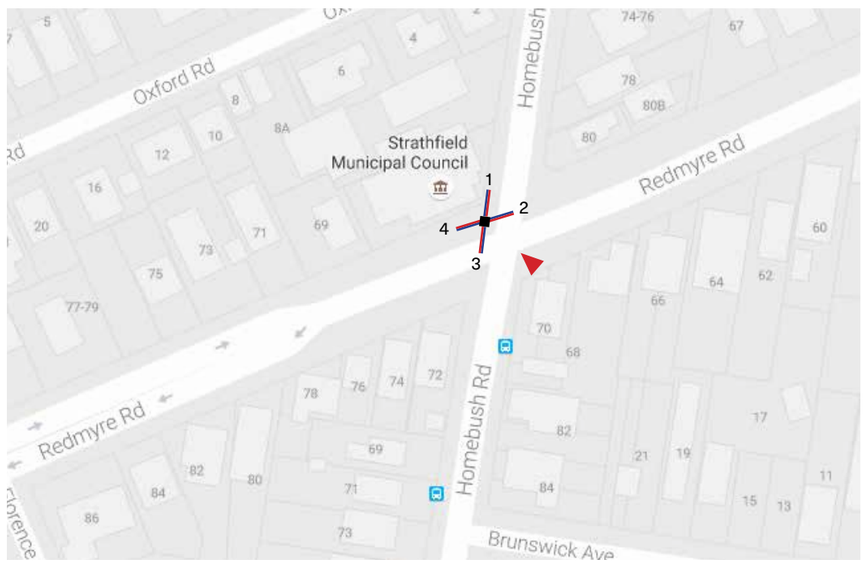
04 SCHEDULE

FINGER		DESTINATION	TIME	DIST
1A	←	Homebush (T)	5	1.3km
		Strathfield (T)	6	1.3km
2A	←	Burwood (T)	8	1.9km
3A	←	South Strathfield	5	1.6km
		Cooks River Path	8	2.2km

AT - STRATHFIELD		Project	Prepared by URBAN&PUBLIC	**SIGNAGE LOCATION**			SIGN NO	**S_06**
A1 **100%**	14 OCT 2016	NOTE		ADDRESS	CNR HOMEBUSH RD &REDMYRE RD		FILENAME	**S_06.AI**

01 STREET VIEW

02 SITE PLAN



03 LEGEND | FINGER SIGN | SIDE A OF SIGN | SIDE B OF SIGN | STREET VIEWPOINT LOCATION

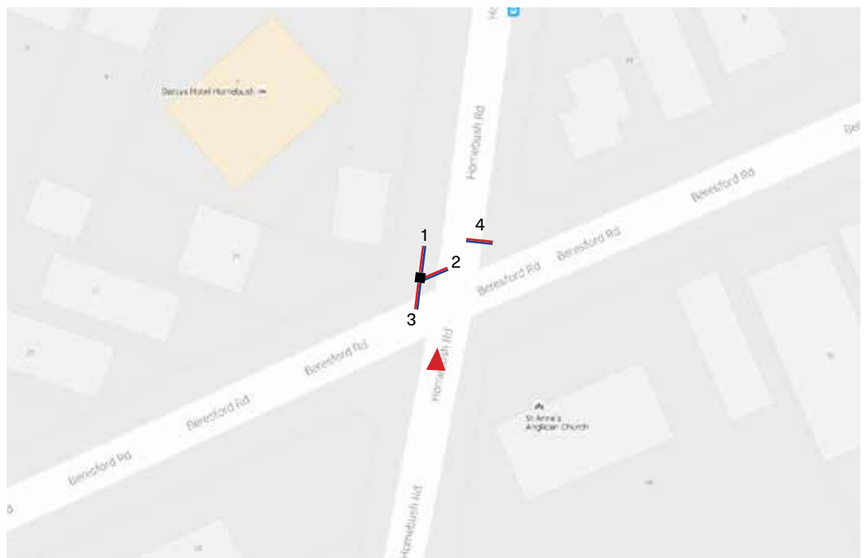
04 SCHEDULE

FINGER		DESTINATION	TIME	DIST
1A	←	Homebush T	5	1.3km
		Flemington T	9	2.7km
2A	←	Strathfield T	5	900m
		Burwood T	7	1.9km
3A	←	Strathfield South	7	1.9km
		Cooks River Path	9	2.5km
		Botany Bay	1h 19m	18.9km
4A	←	Rookwood	10	2.5km

AT - STRATHFIELD		Project	Prepared by URBAN&PUBLIC	SIGNAGE LOCATION		SIGN NO	F_07
A1 **100%**	14 OCT 2016	NOTE		ADDRESS	CNR HOMEBUSH ROAD & BERESFORD ROAD	FILENAME	**F_07.AI**

01 STREET VIEW

02 SITE PLAN



03 LEGEND | FINGER SIGN — SIDE A OF SIGN — SIDE B OF SIGN ▲ STREET VIEWPOINT LOCATION

04 SCHEDULE

FINGER		DESTINATION	TIME	DIST
1A	←	Homebush (T)	2	700
		Flemington (T)	9	2.3km
2A	←	Strathfield (T)	4	700
		Burwood (T)	7	2.2km
3A	←	Strathfield South	8	2.4km
		Cooks River Path	10	2.8km
		Botany Bay	1h 11m	19.5km

4	DESTINATION (n. face- single side)	TIME	DIST
↑	Strathfield South	8	2.4km
	Cooks River Path	10	2.8km
	Botany Bay	1h 11m	19.5km
←	Strathfield (T)	4	700
	Burwood (T)	7	2.2km

04 STREET VIEW 2

AT - STRATHFIELD		Project	Prepared by	SIGNAGE LOCATION		SIGN NO	F_08
A1 **100%**	14 OCT 2016	NOTE	URBAN&PUBLIC	ADDRESS	HOMEBUSH ROAD & THE CRESCENT	FILENAME	**F_08.AI**

01 STREET VIEW

02 SITE PLAN

03 LEGEND | FINGER SIGN | SIDE A OF SIGN | SIDE B OF SIGN | STREET VIEWPOINT LOCATION

04 SCHEDULE

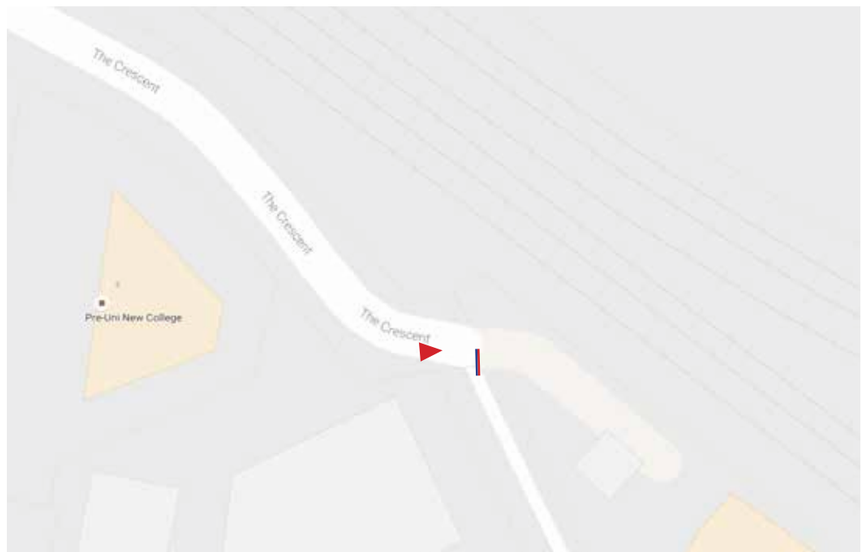
FINGER		DESTINATION	TIME	DIST
1A	←	Strathfield (T)	4	800
		Burwood (T)	9	2km
2A	←	South Strathfield	9	2.7km
		Cooks River Path	13	3.4km
3A	←	Homebush (T)	1	210
		Flemington (T)	7	1.8km

4	DESTINATION (n. face - single sided)	TIME	DIST
↑	Strathfield (T)	4	800
	Burwood (T)	9	2km
→	Strathfield South	9	2.6km
	Cooks River Path	11	3km
	Botany Bay	1h 12m	19.7km

AT - STRATHFIELD		Project	Prepared by URBAN&PUBLIC	**SIGNAGE LOCATION**		SIGN NO	**F_09**
A1 **100%**	14 OCT 2016	NOTE		ADDRESS	THE CRESCENT	FILENAME	**F_09.AI**

01 STREET VIEW

02 SITE PLAN



03 LEGEND | FINGER SIGN | SIDE A OF SIGN | SIDE B OF SIGN | STREET VIEWPOINT LOCATION

04 SCHEDULE

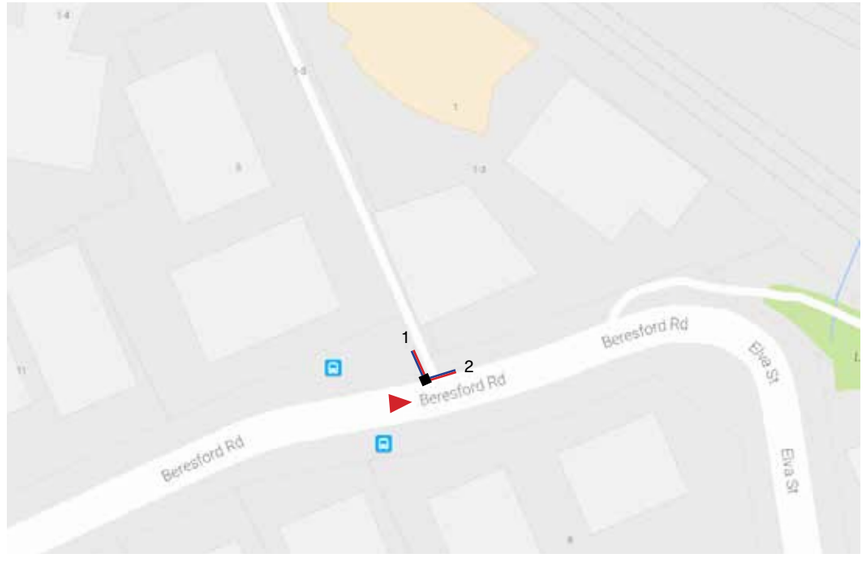
	DESTINATION (west face)	TIME	DIST
↑	Strathfield (T)	4	800
	Burwood (T)	9	2.2km

	DESTINATION (east face)	TIME	DIST
↑	Homebush (T)	1	350
	Flemington (T)	8	1.9km

AT - STRATHFIELD		Project	Prepared by URBAN&PUBLIC	SIGNAGE LOCATION			SIGN NO	S_10
A1 **100%**	14 OCT 2016	NOTE		ADDRESS	BERESFORD RD		FILENAME	S_10.AI

01 STREET VIEW

02 SITE PLAN



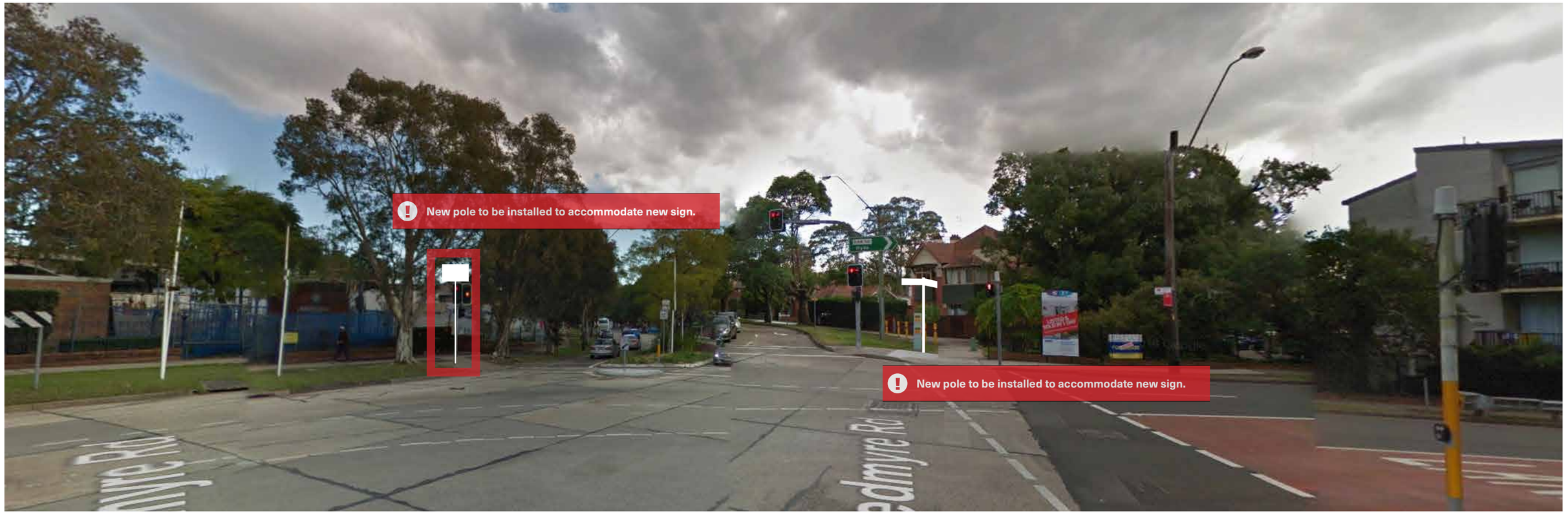
04 SCHEDULE

FINGER		DESTINATION	TIME	DIST
1A	←	Homebush (T)	2	500
		Flemington (T)	9	2.1km
2A	←	Strathfield (T)	3	600m
		Burwood (T)	8	2km

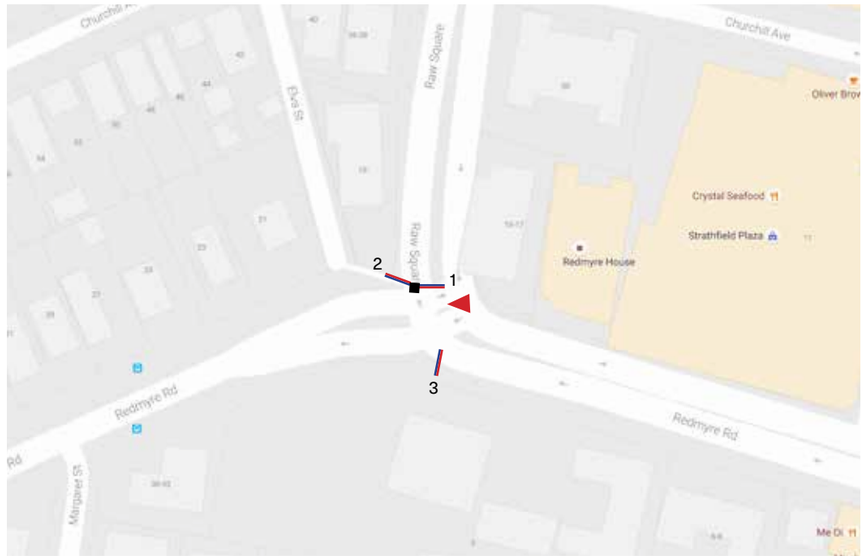
03 LEGEND | FINGER SIGN — SIDE A OF SIGN — SIDE B OF SIGN ▲ STREET VIEWPOINT LOCATION

AT - STRATHFIELD		Project	Prepared by URBAN&PUBLIC	SIGNAGE LOCATION			SIGN NO	S_11
A1 **100%**	14 OCT 2016	NOTE		ADDRESS	REDMYRE RD & RAW SQUARE		FILENAME	S_11.AI

01 STREET VIEW



02 SITE PLAN



03 LEGEND | FINGER SIGN — SIDE A OF SIGN — SIDE B OF SIGN ▲ STREET VIEWPOINT LOCATION

04 SCHEDULE

FINGER		DESTINATION	TIME	DIST
1A	←	Strathfield (T)	4	500
		Burwood (T)	5	1.2km
2A	←	Homebush (T)	7	1.2km
		Flemington (T)	13	3.4km

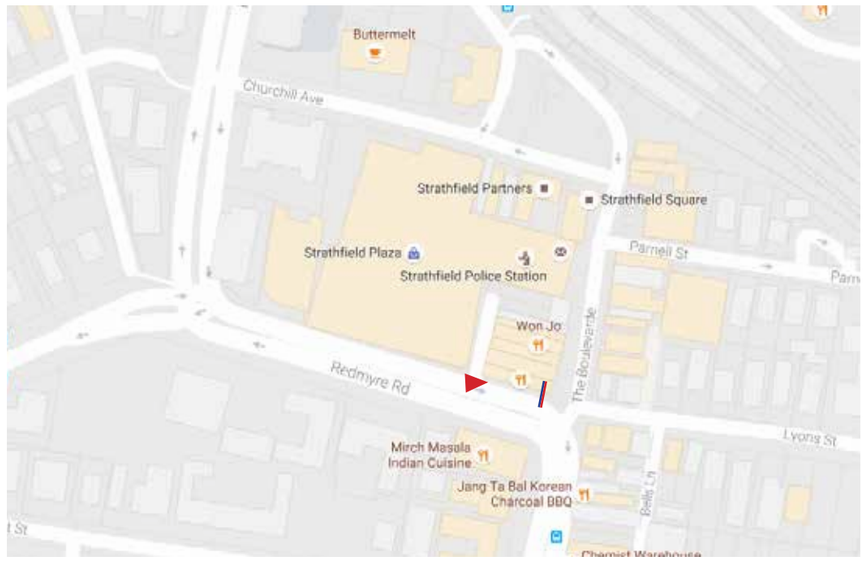
3A	DESTINATION (east face)	TIME	DIST
↑	Rookwood (T)	1	350
	Strathfield South	8	1.9km

3B	DESTINATION (west face)	TIME	DIST
↑	Strathfield (T)	4	800
	Burwood (T)	9	2.2km

AT - STRATHFIELD		Project	Prepared by URBAN&PUBLIC	SIGNAGE LOCATION			SIGN NO	S_12
A1 **100%**	14 OCT 2016	NOTE		ADDRESS	REDMYRE RD & THE BOULEVARDE		FILENAME	S_12.AI

01 STREET VIEW

02 SITE PLAN



03 LEGEND | FINGER SIGN | SIDE A OF SIGN | SIDE B OF SIGN | STREET VIEWPOINT LOCATION

04 SCHEDULE

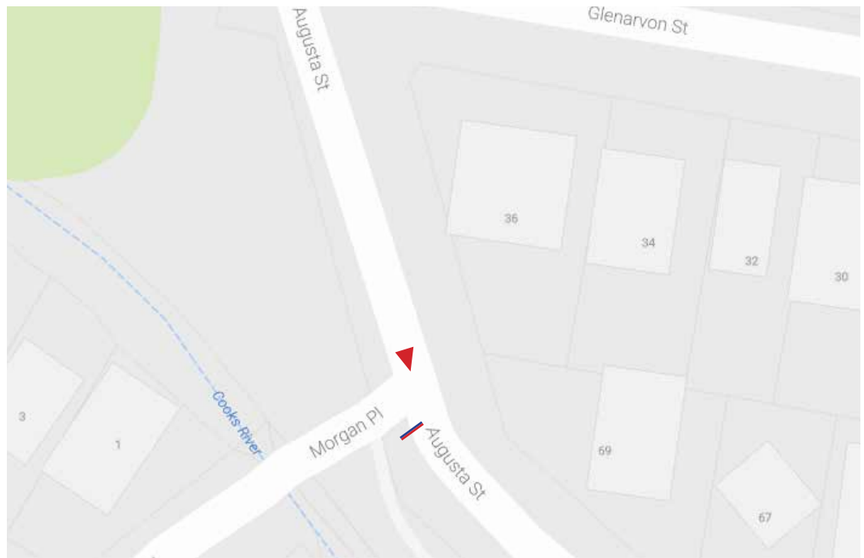
FLAG	DESTINATION (west face)	TIME	DIST
←	Strathfield (T)	3	270
→	Burwood (T)	5	1.1km

FLAG	DESTINATION (east face)	TIME	DIST
↑	Homebush (T)	1	1.3km
	Flemington (T)	11	3.5km
	Strathfield South	9	2.6km
	Cooks River Path	11	3.2km
	Botany Bay	1h 12m	19.6km

AT - STRATHFIELD		Project	Prepared by URBAN&PUBLIC	SIGNAGE LOCATION			SIGN NO	S_13
A1 **100%**	14 OCT 2016	NOTE		ADDRESS	AUGUSTA ST & MORGAN PLACE		FILENAME	S_13.AI

01 STREET VIEW

02 SITE PLAN



03 LEGEND | FINGER SIGN | SIDE A OF SIGN | SIDE B OF SIGN | STREET VIEWPOINT LOCATION

04 SCHEDULE

FLAG	DESTINATION (north face)	TIME	DIST
↑	Strathfield South	1	500m
	Botany Bay	1h 5m	18.3km

FLAG	DESTINATION (north face)	TIME	DIST
↑	Rookwood	11	2.7km
	Flemington (T)	13	3.5km
	Bicentennial Park	21	6.1km
	Olympic Park (T)	25	6.9km
	Parramatta Valley Cycleway	35	10.2km

05 EXISTING SIGN SCHEDULE

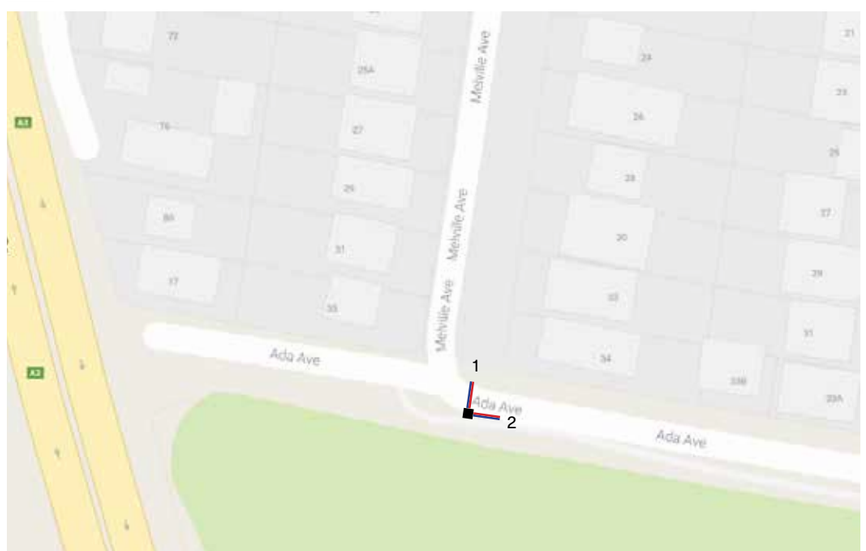
RMS_13		DESTINATION (north face)
1	↑	Strathfield South
		Botany Bay

RMS_13		DESTINATION (south face)
2	↑	Strathfield
		Homebush Bay

AT - STRATHFIELD		Project	Prepared by	SIGNAGE LOCATION			SIGN NO	S_14
A1 **100%**	14 OCT 2016	NOTE	URBAN&PUBLIC	ADDRESS	ADA AVE & MELVILLE AVE		FILENAME	**S_14.AI**

01 STREET VIEW

02 SITE PLAN



03 LEGEND | FINGER SIGN | SIDE A OF SIGN | SIDE B OF SIGN | STREET VIEWPOINT LOCATION

04 SCHEDULE

FINGER		DESTINATION	TIME	DIST
1A	→	Rookwood	5	1km
		Flemington (T)	8	2.2km
		Bicentennial Park	17	4.7km
		Olympic Park (T)	21	5.5km
		Parramatta Valley Cycleway	31	8.9km
2A	→	Strathfield South	4	1.4km
		Botany Bay	1h 7m	19.2km

FINGER		DESTINATION	TIME	DIST
1A	→	Rookwood	5	1.5km
		Flemington (T)	8	2.7km
		Bicentennial Park	17	5.2km
		Olympic Park (T)	21	6km
		Parramatta Valley Cycleway	34	9.4
2A	→	Strathfield South	4	1.4km
		Botany Bay	1h 7m	19.2km

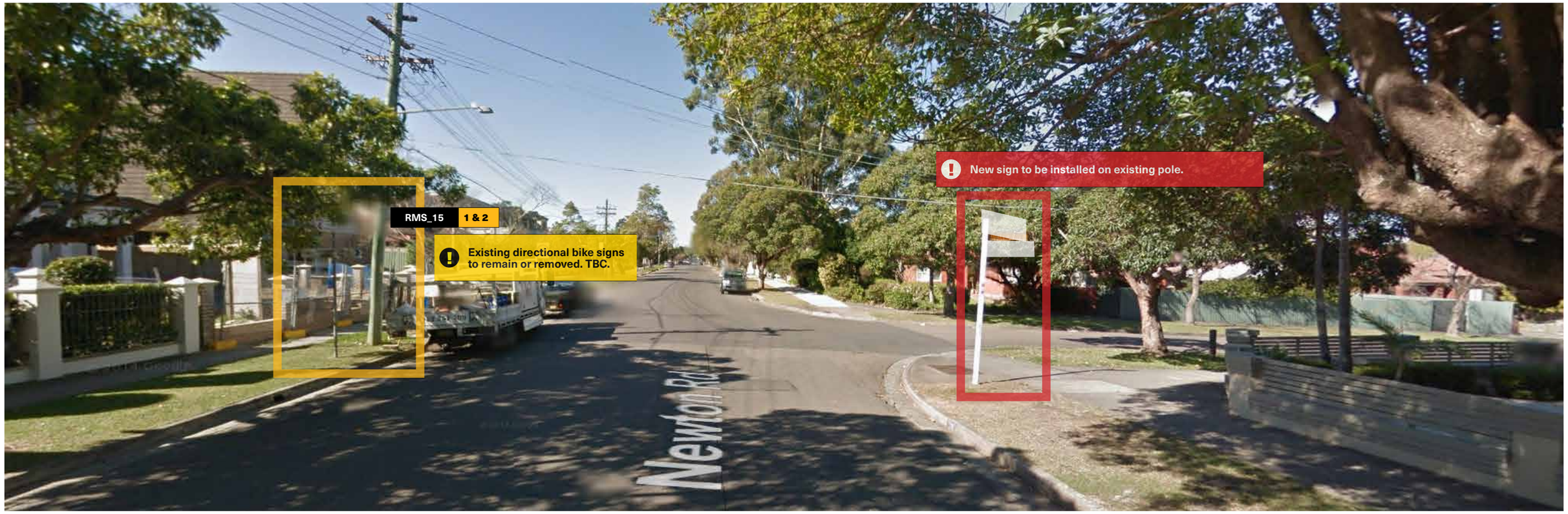
05 EXISTING SIGN SCHEDULE

RMS_14		DESTINATION
1	←	Strathfield
		Homebush Bay
2	←	Strathfield South
		Botany Bay

RMS_14		DESTINATION
3	↑	Strathfield
		Homebush Bay

AT - STRATHFIELD		Project	Prepared by	SIGNAGE LOCATION			SIGN NO	S_15
A1 **100%**	14 OCT 2016	NOTE		ADDRESS	MELVILLE AVE & NEWTON RD		FILENAME	**S_15.AI**

01 STREET VIEW



02 SITE PLAN

03 LEGEND | FINGER SIGN | SIDE A OF SIGN | SIDE B OF SIGN | STREET VIEWPOINT LOCATION

04 SCHEDULE

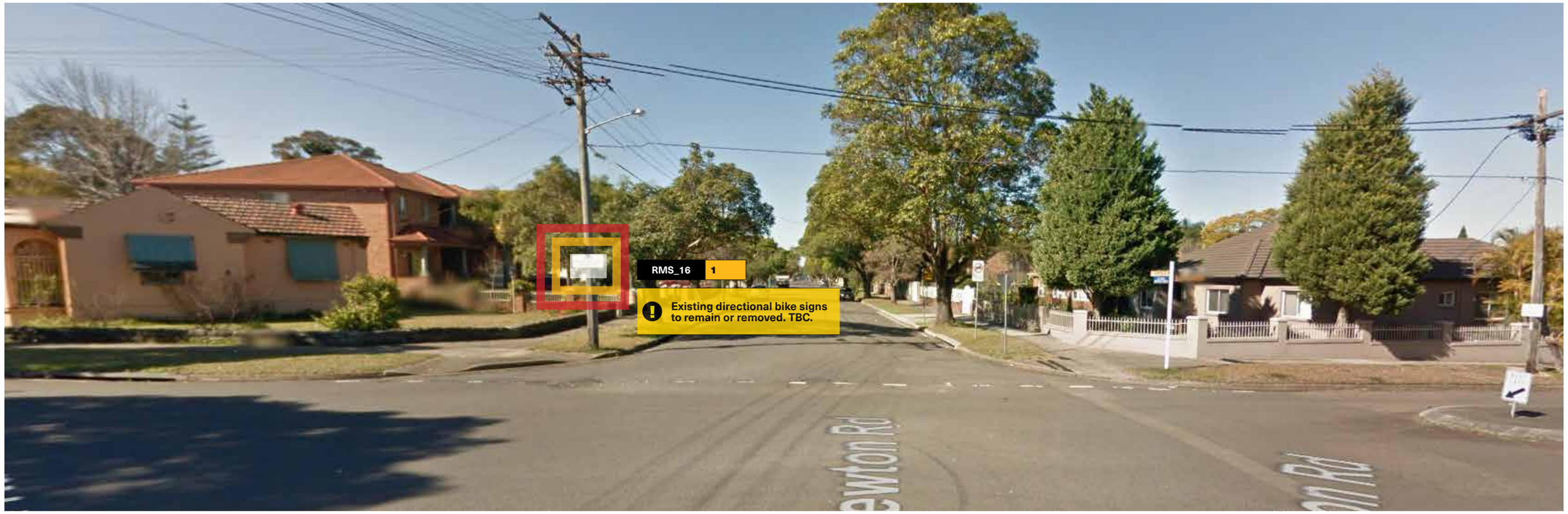
FINGER		DESTINATION	TIME	DIST
1A	←	Rookwood	4	700m
		Flemington (T)	7	1.9km
		Bicentennial Park	16	4.4km
		Olympic Park (T)	20	5.2km
		Parramatta Valley Cycleway	32	9.1km
2A	←	Cooks River Path	1	350m
		Strathfield South	5	1.7km
		Botany Bay	1h 9m	19.5km

05 EXISTING SIGN SCHEDULE

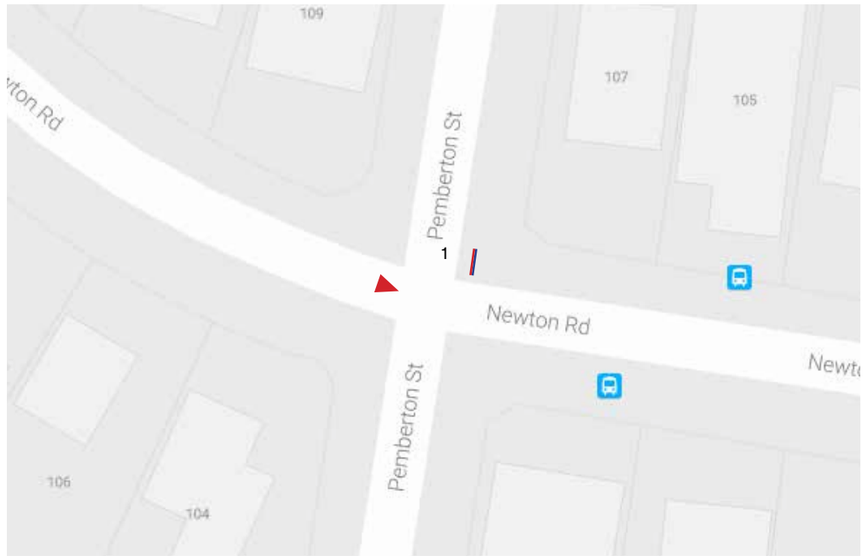
RMS_15		DESTINATION	TIME	DIST
1	←	Homebush		
		Homebush Bay		
2	←	Strathfield South		
		Botany Bay		

AT - STRATHFIELD		Project	Prepared by URBAN&PUBLIC	SIGNAGE LOCATION			SIGN NO	S_16
A1 **100%**	14 OCT 2016	NOTE		ADDRESS	NEWTON RD & PEMBERTON ST		FILENAME	**S_16.AI**

01 STREET VIEW



02 SITE PLAN



03 LEGEND | FINGER SIGN | SIDE A OF SIGN | SIDE B OF SIGN | STREET VIEWPOINT LOCATION

04 SCHEDULE

FLAG	DESTINATION (west face)	TIME	DIST
↑	Cooks River Path	1	450
	Strathfield South	5	1.8km
	Botany Bay	1h 9m	19.6km

FLAG	DESTINATION (east face)	TIME	DIST
↑	Rookwood	4	600m
	Flemington T	13	3.5km
	Bicentennial Park	21	6.1km
	Olympic Park T	25	6.9km
	Parramatta Valley Cycleway	35	10.2km

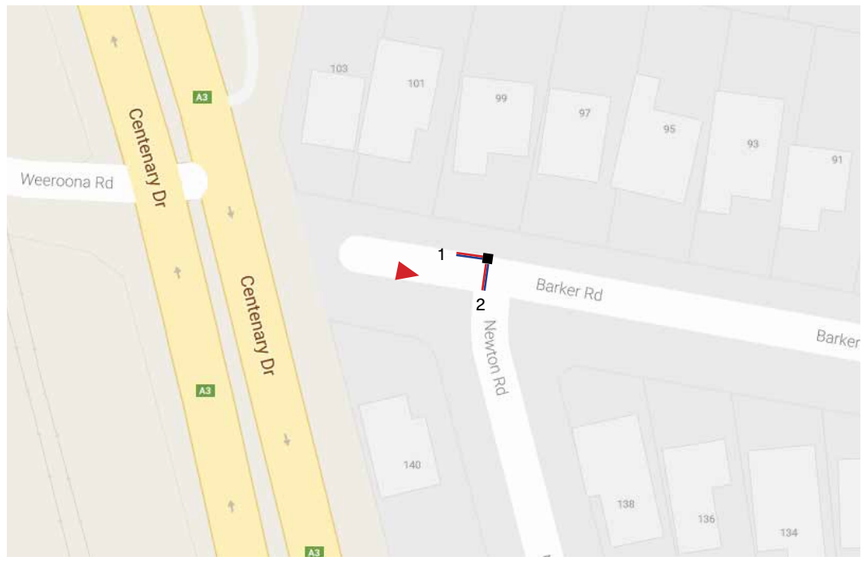
05 EXISTING SIGN SCHEDULE

RMS_15		DESTINATION	TIME	DIST
1	↑	Strathfield South		
		Botany Bay		

AT - STRATHFIELD		Project	Prepared by	SIGNAGE LOCATION			SIGN NO	S_17
A1 **100%**	14 OCT 2016	NOTE	URBAN&PUBLIC	ADDRESS	NEWTON RD & BARKER ST		FILENAME	**S_17.AI**

01 STREET VIEW

02 SITE PLAN



03 LEGEND | FINGER SIGN | SIDE A OF SIGN | SIDE B OF SIGN | STREET VIEWPOINT LOCATION

04 SCHEDULE

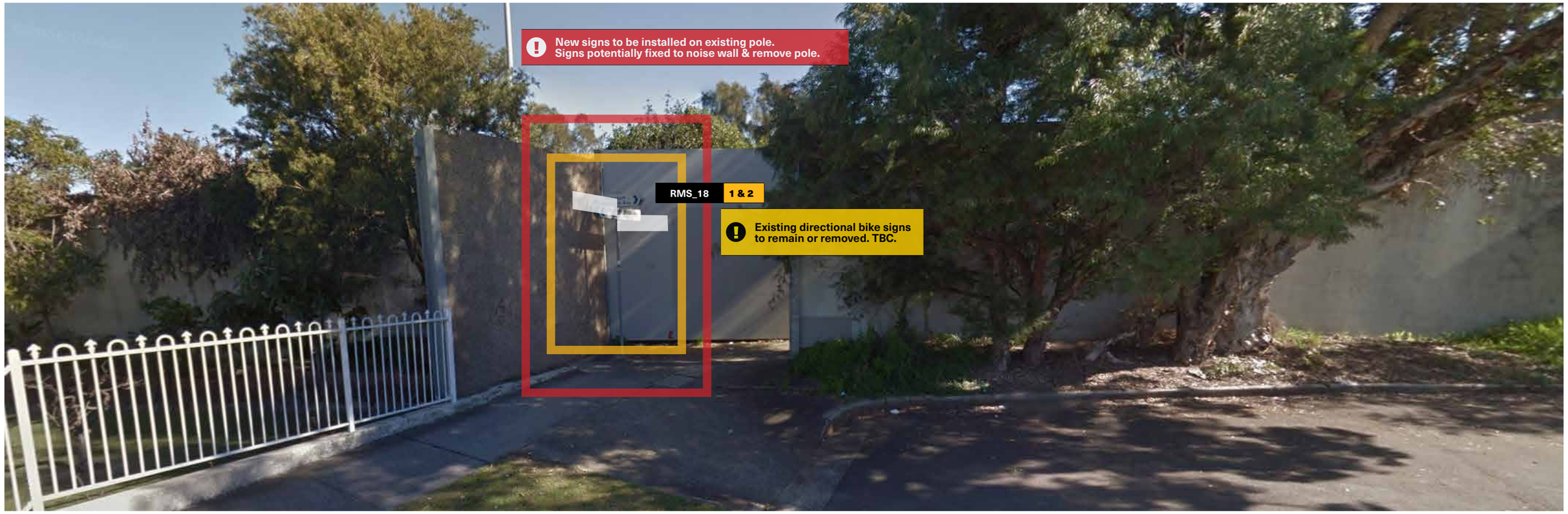
FINGER		DESTINATION	TIME	DIST
1A	←	Rookwood	2	270
		Flemington (T)	4	1.3km
		Bicentennial Park	13	4km
		Olympic Park (T)	17	4.4km
		Parramatta Valley Cycleway	30	8.7km
2A	←	Cooks River Path	1	360m
		Strathfield South	5	1.8km
		Botany Bay	1h 9m	19.6km

05 EXISTING SIGN SCHEDULE

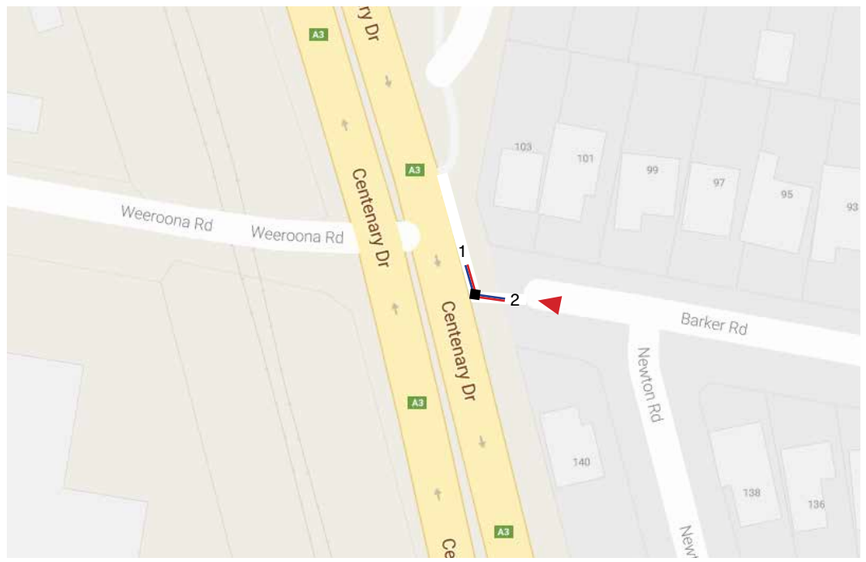
RMS_17		DESTINATION	TIME	DIST
1	←	Homebush		
		Homebush Bay		
2	←	Strathfield South		
		Botany Bay		

AT - STRATHFIELD		Project	Prepared by	SIGNAGE LOCATION			SIGN NO	S_18
A1 **100%**	14 OCT 2016	NOTE	URBAN&PUBLIC	ADDRESS	BARKER ST		FILENAME	**S_18.AI**

01 STREET VIEW



02 SITE PLAN



03 LEGEND | FINGER SIGN | SIDE A OF SIGN | SIDE B OF SIGN | STREET VIEWPOINT LOCATION

04 SCHEDULE

FINGER		DESTINATION	TIME	DIST
1A	←	Rookwood	2	240
		Flemington (T)	4	1.2km
		Bicentennial Park	13	3.9km
		Olympic Park (T)	17	4.3km
		Parramatta Valley Cycleway	30	8.6km
2A	←	Cooks River Path	1	350m
		Strathfield South	5	1.7km
		Botany Bay	1h 9m	19.5km

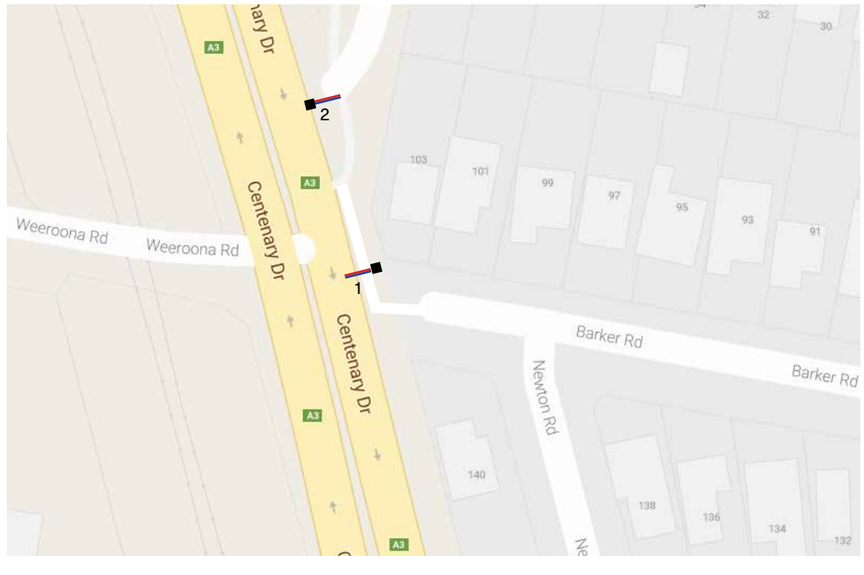
05 EXISTING SIGN SCHEDULE

RMS_18		DESTINATION	TIME	DIST
1	←	Homebush		
		Homebush Bay		
2	←	Strathfield South		
		Botany Bay		

AT - STRATHFIELD		Project	Prepared by URBAN&PUBLIC	SIGNAGE LOCATION			SIGN NO	S_19 A+B
A1 **100%**	14 OCT 2016	NOTE		ADDRESS	CENTENARY DRIVE		FILENAME	S_19.AI

01 STREET VIEW

02 SITE PLAN



03 LEGEND | FINGER SIGN | SIDE A OF SIGN | SIDE B OF SIGN | STREET VIEWPOINT LOCATION

04 SCHEDULE

FINGER		DESTINATION	TIME	DIST
1A	←	Rookwood	2	220

FINGER		DESTINATION	TIME	DIST
2A	→	Flemington (T)	4	1.2km
		Bicentennial Park	13	3.9km
		Olympic Park (T)	17	4.3km
		Parramatta Valley Cycleway	30	8.6km

05 EXISTING SIGN SCHEDULE

RMS_19		DESTINATION	TIME	DIST
2A	←	Ryde		

RMS_19		DESTINATION	TIME	DIST
1A	←	Homebush		
		Homebush Bay		

AT - STRATHFIELD		Project	Prepared by URBAN&PUBLIC	SIGNAGE LOCATION		SIGN NO	F_20
A1 **100%**	14 OCT 2016	NOTE		ADDRESS	MITCHELL ROAD & KARUAH ST	FILENAME	**F_20.AI**

01 STREET VIEW

02 SITE PLAN

03 LEGEND | FINGER SIGN | SIDE A OF SIGN | SIDE B OF SIGN | STREET VIEWPOINT LOCATION

04 SCHEDULE

	DESTINATION (north face)	TIME	DIST
↑	Rookwood	3	400m
	Cooks River Path	4	850m
	Botany Bay	1h 12min	20.3km

	DESTINATION (south face)	TIME	DIST
↑	Flemington (T)	4	1.1km
	Bicentennial Park	13	3.8km
	Olympic Park (T)	17	4.2km
	Parramatta Valley Cycleway	30	8.5km

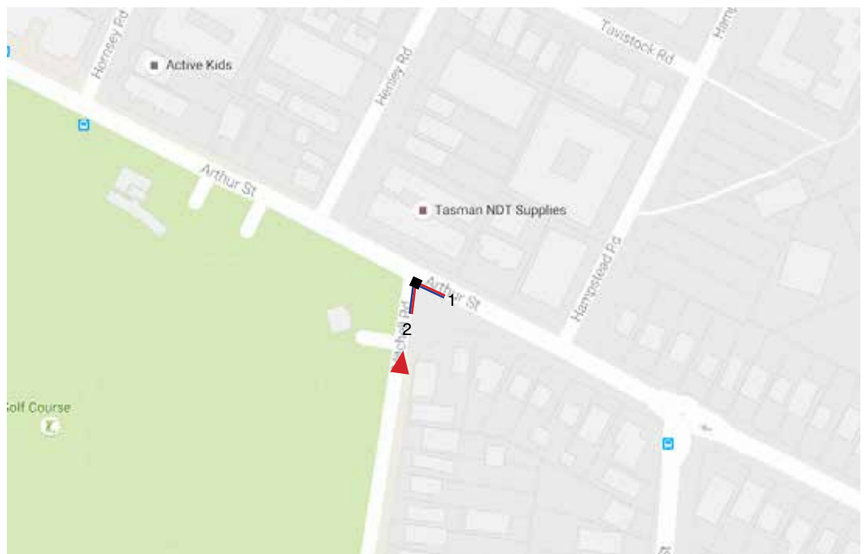
05 EXISTING SIGN SCHEDULE

RMS_20		DESTINATION (south)	TIME	DIST
1	↑	Strathfield South		
		Botany Bay		
2	↑	Homebush		
		Homebush Station		

AT - STRATHFIELD		Project	Prepared by	SIGNAGE LOCATION		SIGN NO	F_21
A1 **100%**	14 OCT 2016	NOTE		ADDRESS	CNR ARTHUR STREET & MITCHELL RD	FILENAME	**F_21.AI**

01 STREET VIEW

02 SITE PLAN



03 LEGEND | FINGER SIGN | SIDE A OF SIGN | SIDE B OF SIGN | STREET VIEWPOINT LOCATION

04 SCHEDULE

FINGER		DESTINATION	TIME	DIST
1A	→	Flemington (T)	2	800
		Strathfield	12	2.9km
		Bicentennial Park	12	3.3km
		Olympic Park (T)	15	4.1km
		Parramatta Valley Cycleway	29	8.3km
2A	→	Cooks River Path	5	1.3km
		Strathfield South	9	2.7km
		Botany Bay	1h 13min	20.7km

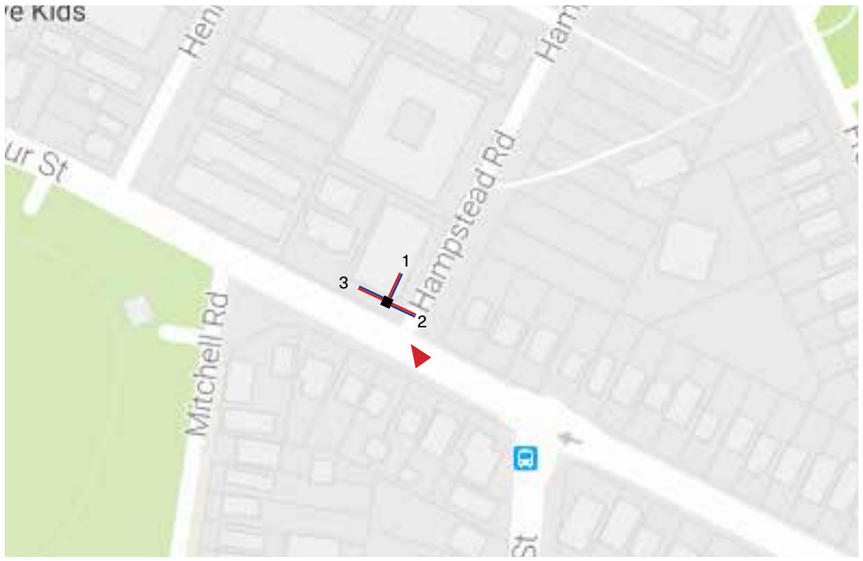
05 EXISTING SIGN SCHEDULE

RMS_21		DESTINATION (north face)	TIME	DIST
1	←	Strathfield South		
		Botany Bay		
2	←	Strathfield South		
		Botany Bay		

AT - STRATHFIELD		Project	Prepared by URBAN&PUBLIC	SIGNAGE LOCATION			SIGN NO	S_22
A1 **100%**	14 OCT 2016	NOTE		ADDRESS	ARTHUR ST & HAMPSTEAD RD		FILENAME	S_22.AI

01 STREET VIEW

02 SITE PLAN



03 LEGEND | FINGER SIGN — SIDE A OF SIGN — SIDE B OF SIGN — STREET VIEWPOINT LOCATION

04 SCHEDULE

FINGER		DESTINATION	TIME	DIST
1A	→	Flemington (T)	2	700
		Bicentennial Park	12	3.2km
		Olympic Park (T)	15	4km
		Parramatta Valley Cycleway	29	8.2km
2A	→	Strathfield (T)	12	2.8km
		Burwood (T)	21	4km
3A	→	Cooks River Path	5	1.2km
		Strathfield South	9	2.6km
		Botany Bay	1h 13min	20.6km

05 EXISTING SIGN SCHEDULE

FINGER		DESTINATION	TIME	DIST
1A	←	Ryde		

AT - STRATHFIELD		Project	Prepared by URBAN&PUBLIC	SIGNAGE LOCATION			SIGN NO	S_23
A1 **100%**	14 OCT 2016	NOTE		ADDRESS	HAMPSTEAD RD		FILENAME	S_23.AI

01 STREET VIEW

02 SITE PLAN

03 LEGEND | FINGER SIGN | SIDE A OF SIGN | SIDE B OF SIGN | STREET VIEWPOINT LOCATION

04 SCHEDULE

FINGER		DESTINATION	TIME	DIST
1	→	Flemington (T)	2	650
2	→	Bicentennial Park	12	3.15km
		Olympic Park (T)	15	3.95km
		Parramatta Valley Cycleway	29	8.15km
3	←	Cooks River Path	5	1.2km
		Strathfield South	9	2.6km
		Botany Bay	1h 13min	20.6km

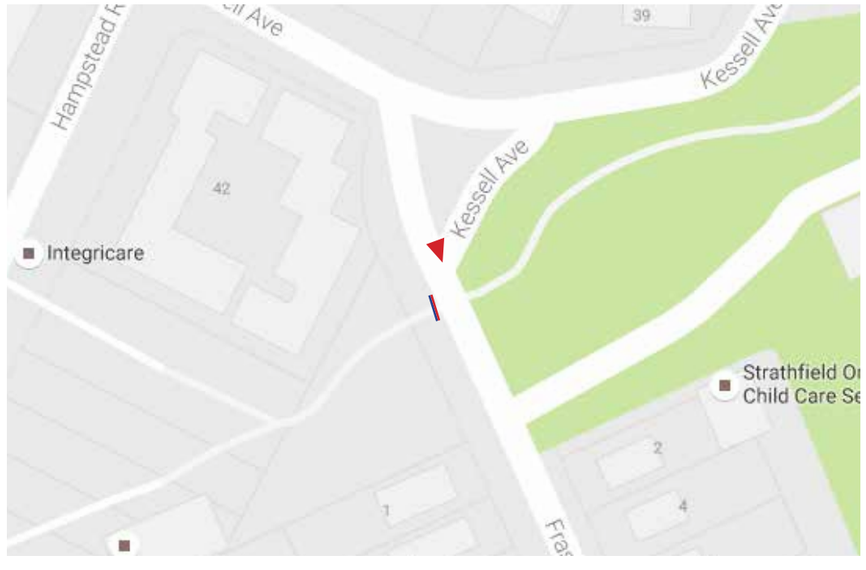
05 EXISTING SIGN SCHEDULE

RMS_23		DESTINATION	TIME	DIST
1	←	Homebush		
		Homebush Bay		
2	←	Strathfield		
		Botany Bay		

AT - STRATHFIELD		Project	Prepared by	SIGNAGE LOCATION			SIGN NO	S_24
A1 **100%**	14 OCT 2016	NOTE	URBAN&PUBLIC	ADDRESS	FRASER ST		FILENAME	**S_24.AI**

01 STREET VIEW

02 SITE PLAN



03 LEGEND | FINGER SIGN | SIDE A OF SIGN | SIDE B OF SIGN | STREET VIEWPOINT LOCATION

04 SCHEDULE

	DESTINATION (east face)	TIME	DIST
↑	Rookwood	5	1.1km
	Cooks River Path	6	1.5km
	South Strathfield	10	2.9km
	Botany Bay	1h 14min	21km

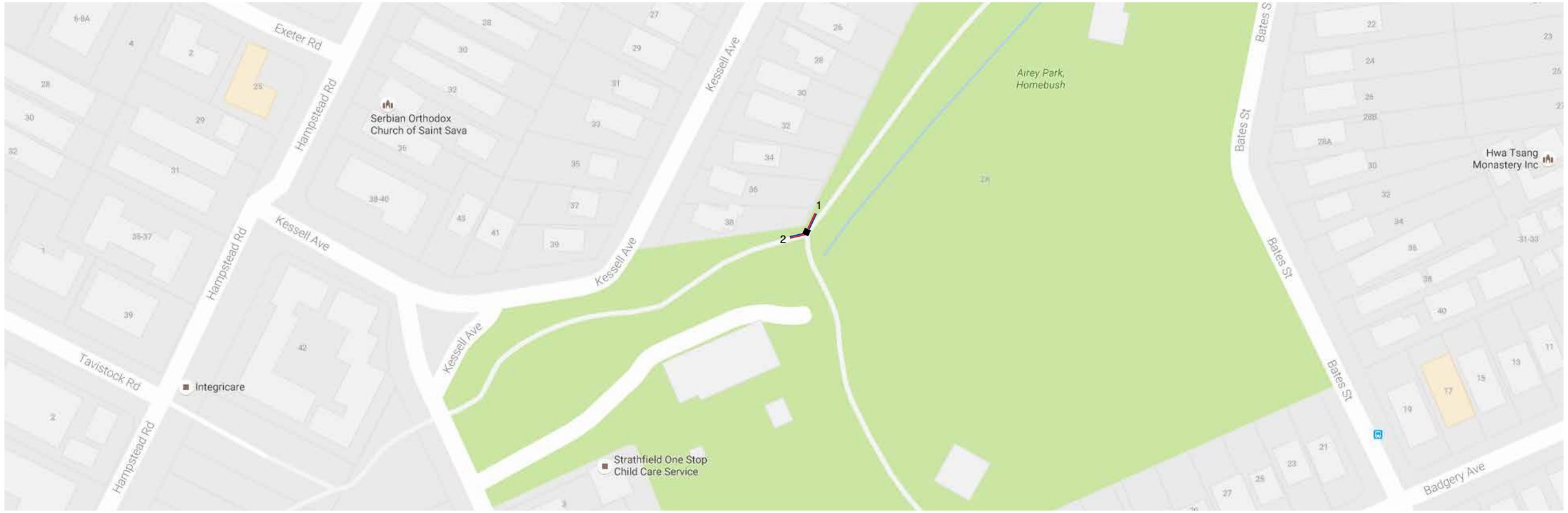
	DESTINATION (west face)	TIME	DIST
↑	Bicentennial Park	10	2.9km
	Olympic Park (T)	15	3.7km
	Parramatta Valley Cycleway	27	7.7km

05 EXISTING SIGN SCHEDULE

RMS_24		DESTINATION	TIME	DIST
1A	↑	Strathfield		
		Botany Bay		
2A	↑	Homebush		
		Homebush Bay		

AT - STRATHFIELD		Project	Prepared by URBAN&PUBLIC	SIGNAGE LOCATION			SIGN NO	S_25
A1 **100%**	14 OCT 2016	NOTE		ADDRESS	AIREY PARK		FILENAME	**S_25.AI**

01 SITE PLAN



04 SCHEDULE

FINGER		DESTINATION	TIME	DIST
1A	←	Bicentennial Park	10	2.7km
		Olympic Park (T)	14	3.6km
		Parramatta Valley Cycleway	27	7.5km
2A	←	Rookwood	5	1.1km
		Cooks River Path	7	1.7km
		South Strathfield	10	2.9km
		Botany Bay	1h 14min	21.2km

03 LEGEND | FINGER SIGN | SIDE A OF SIGN | SIDE B OF SIGN | STREET VIEWPOINT LOCATION

AT - STRATHFIELD		Project	Prepared by URBAN&PUBLIC	SIGNAGE LOCATION			SIGN NO	S_26
A1 **100%**	14 OCT 2016	NOTE		ADDRESS	BATES ST		FILENAME	S_26.AI

01 STREET VIEW

02 SITE PLAN

03 LEGEND | FINGER SIGN | SIDE A OF SIGN | SIDE B OF SIGN | STREET VIEWPOINT LOCATION

04 SCHEDULE

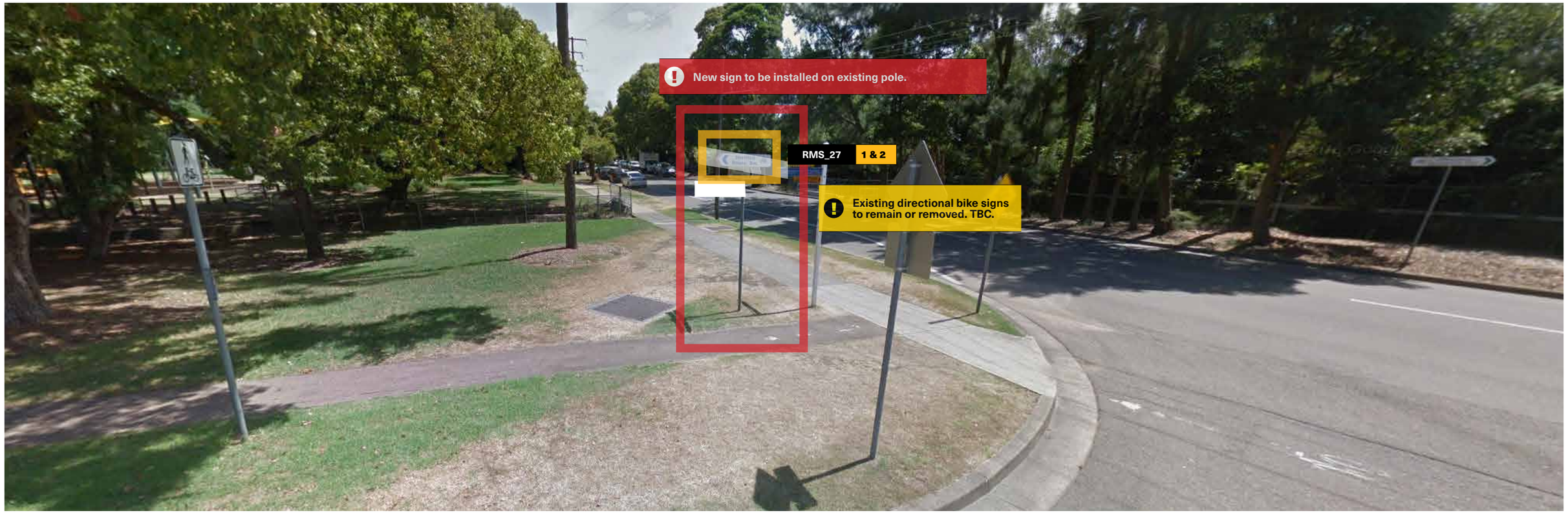
FINGER		DESTINATION	TIME	DIST
1A	←	Bicentennial Park	9	3km
		Olympic Park (T)	13	3.2km
		Parramatta Valley Cycleway	26	7.2km
2A	←	Rookwood	6	1.4km
		Cooks River Path	9	2.2
		South Strathfield	14	3.8km
		Botany Bay	1h 15min	21.5km

05 EXISTING SIGN SCHEDULE

RMS_26		DESTINATION	TIME	DIST
1	←	Strathfield		
		Botany Bay		
2	←	Homebush		
		Homebush Bay		

AT - STRATHFIELD		Project	Prepared by URBAN&PUBLIC	SIGNAGE LOCATION			SIGN NO	S_27
A1 **100%**	14 OCT 2016	NOTE		ADDRESS	CNR BATES ST & THE CRESCENT		FILENAME	S_27.AI

01 STREET VIEW



02 SITE PLAN

03 LEGEND | FINGER SIGN | SIDE A OF SIGN | SIDE B OF SIGN | STREET VIEWPOINT LOCATION

04 SCHEDULE

FINGER		DESTINATION	TIME	DIST
1A	←	Bicentennial Park	9	2.9km
		Olympic Park (T)	13	3.1km
		Parramatta Valley Cycleway	26	7.1km
2A	←	Rookwood	6	1.5km
		Cooks River Path	9	2.3km
		South Strathfield	14	3.9km
		Botany Bay	1h 14min	21.6km
3A	←	Flemington (T)	2	450

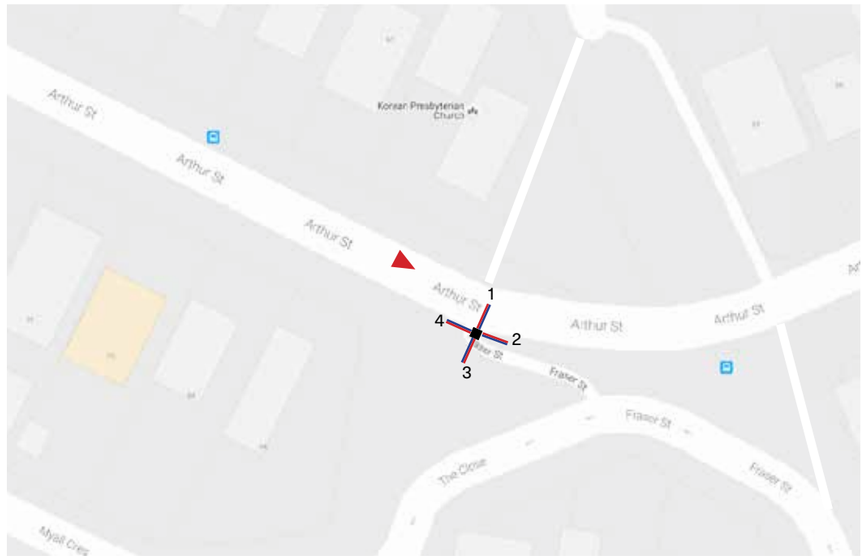
05 EXISTING SIGN SCHEDULE

FINGER		DESTINATION	TIME	DIST
1A	←	Strathfield		
		Botany Bay		
2A	←	Homebush		
		Homebush Bay		

AT - STRATHFIELD		Project	Prepared by URBAN&PUBLIC	SIGNAGE LOCATION		SIGN NO	F_28
A1 **100%**	14 OCT 2016	NOTE		ADDRESS	ARTHUR STREET & FRASER STREET	FILENAME	**F_28.AI**

01 STREET VIEW

02 SITE PLAN



03 LEGEND | FINGER SIGN | SIDE A OF SIGN | SIDE B OF SIGN | STREET VIEWPOINT LOCATION

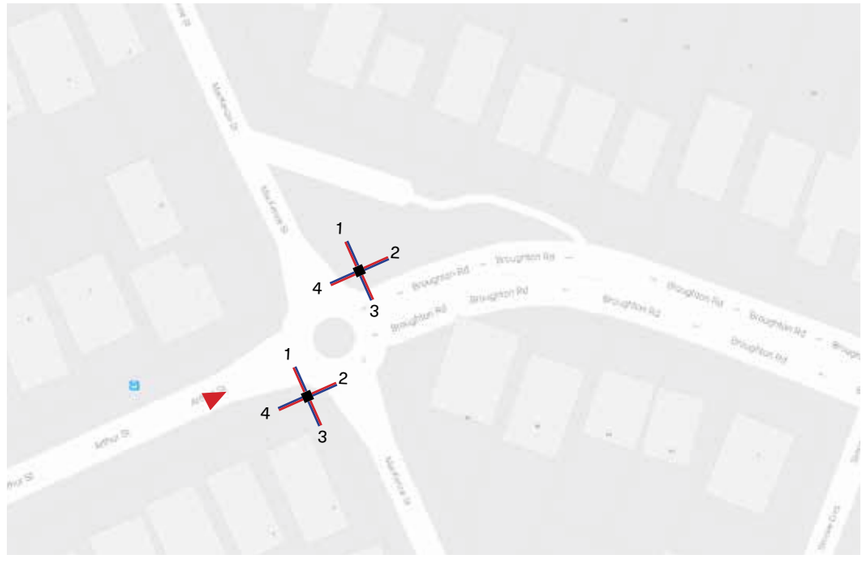
04 SCHEDULE

FINGER		DESTINATION	TIME	DIST
1A	←	Airey Park	1	170
		Flemington (T)	5	1km
2A	←	Homebush (T)	7	1.8km
		Strathfield (T)	12	2.5km
		Burwood (T)	17	4.2km
3A	←	Cooks River Path	5	1.5km
		Strathfield South	9	2.7km
		Botany Bay	1h 14min	20.9km
4A	←	Rookwood	6	1.5km

AT - STRATHFIELD		Project	Prepared by URBAN&PUBLIC	**SIGNAGE LOCATION**		SIGN NO	**F_29**
A1 **100%**	14 OCT 2016	NOTE		ADDRESS	CNR BROUGHTON ROAD & MACKENZIE STREET	FILENAME	**F_29.AI**

01 STREET VIEW

02 SITE PLAN



03 LEGEND | FINGER SIGN — SIDE A OF SIGN — SIDE B OF SIGN ▲ STREET VIEWPOINT LOCATION

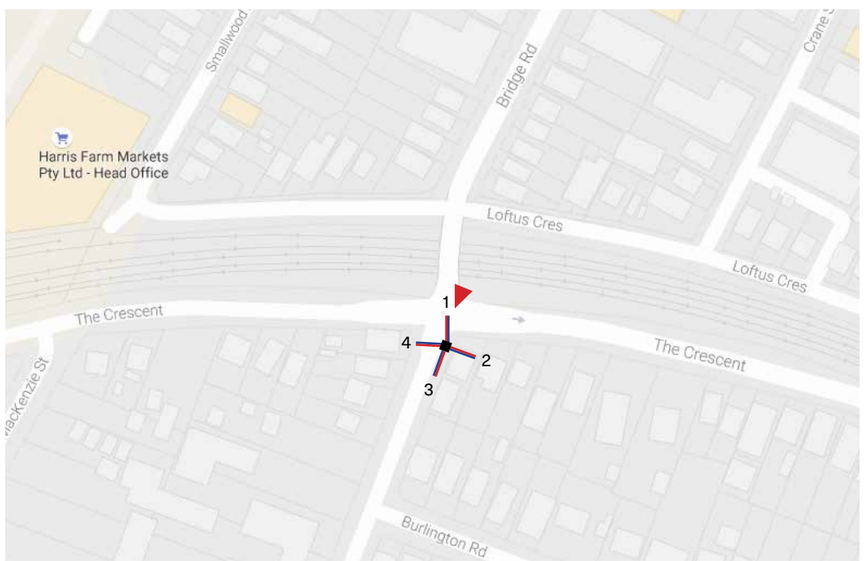
04 SCHEDULE

FINGER		DESTINATION	TIME	DIST
1A	→	Homebush (T)	7	1.8km
		Bicentennial Park	9	2.5km
		Olympic Park (T)	13	3.3km
		Parramatta Valley Cycleway	26	7.3km
2A	→	Strathfield (T)	8	1.7km
		Burwood (T)	14	3.3km
3A	→	Cooks River Path	7	2km
		Strathfield South	9	2.7km
		Botany Bay	1h 14min	20.9km
4A	→	Flemington (T)	5	1km
		Rookwood	7	1.8km

AT - STRATHFIELD		Project	Prepared by	SIGNAGE LOCATION		SIGN NO	F_30
A1 **100%**	14 OCT 2016	NOTE	URBAN&PUBLIC	ADDRESS	BRIDGE ROAD & THE CRESCENT	FILENAME	F_30.AI

01 STREET VIEW

02 SITE PLAN



03 LEGEND | FINGER SIGN | SIDE A OF SIGN | SIDE B OF SIGN | STREET VIEWPOINT LOCATION

04 SCHEDULE

FINGER		DESTINATION	TIME	DIST
1A	←	Bicentennial Park	9	2.1km
		Olympic Park (T)	11	2.7km
		Parramatta Valley Cycleway	24	6.8km
2A	←	Homebush (T)	3	750m
		Strathfield (T)	9	2km
		Burwood (T)	13	3.1km
3A	←	Cooks River Path	9	2.5km
		Botany Bay	1h 15m	21.3km
4A	←	Flemington (T)	2	750

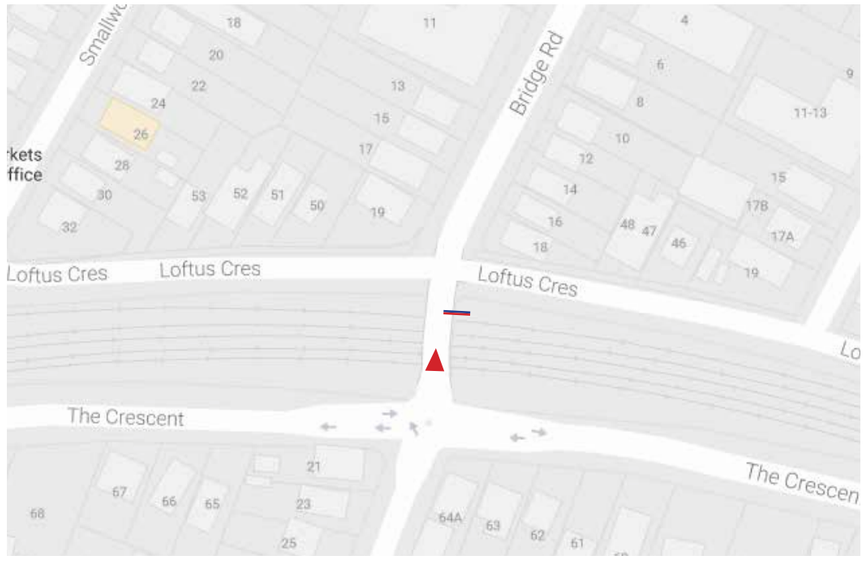
05 EXISTING SIGN SCHEDULE

RMS_30		DESTINATION	TIME	DIST
1	←	Strathfield		
		Botany Bay		
2	←	Homebush		
		Homebush Bay		

AT - STRATHFIELD		Project	Prepared by URBAN&PUBLIC	SIGNAGE LOCATION			SIGN NO	S_31
A1 **100%**	14 OCT 2016	NOTE		ADDRESS	BRIDGE RD & LOFTUS CRES		FILENAME	S_31.AI

01 STREET VIEW

02 SITE PLAN



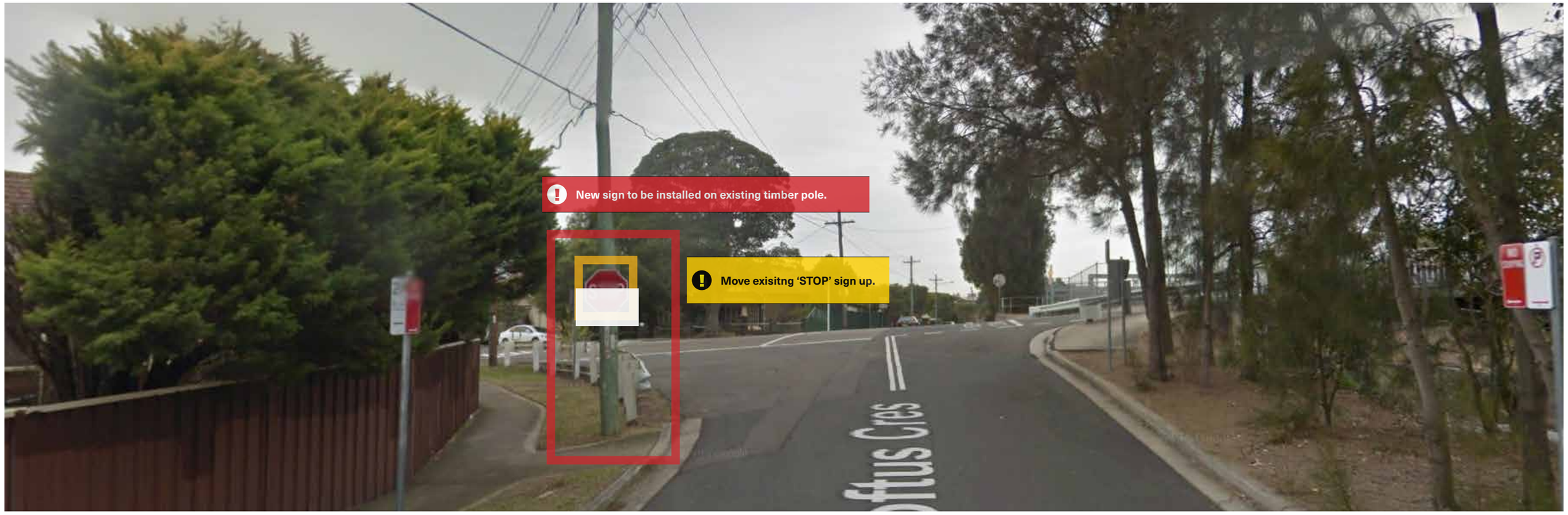
03 LEGEND | FINGER SIGN | SIDE A OF SIGN | SIDE B OF SIGN | STREET VIEWPOINT LOCATION

04 SCHEDULE

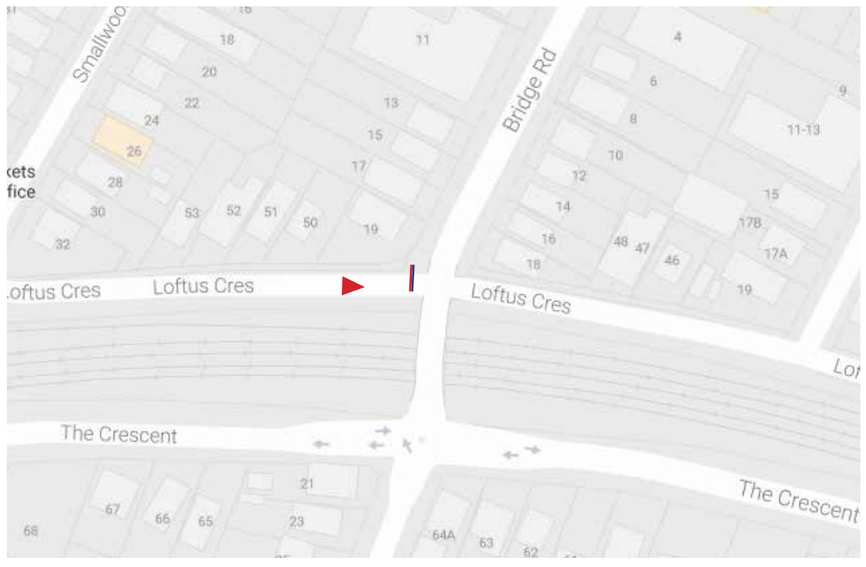
FLAG	DESTINATION (south face only)	TIME	DIST
↑	Bicentennial Park	9	2.1km
	Olympic Park T	11	2.7km
	Parramatta Valley Cycleway	24	6.8km

AT - STRATHFIELD		Project	Prepared by URBAN&PUBLIC	SIGNAGE LOCATION			SIGN NO	S_32
A1 **100%**	14 OCT 2016	NOTE		ADDRESS	LOFTUS CRES & BRIDGE RD		FILENAME	S_32.AI

01 STREET VIEW



02 SITE PLAN



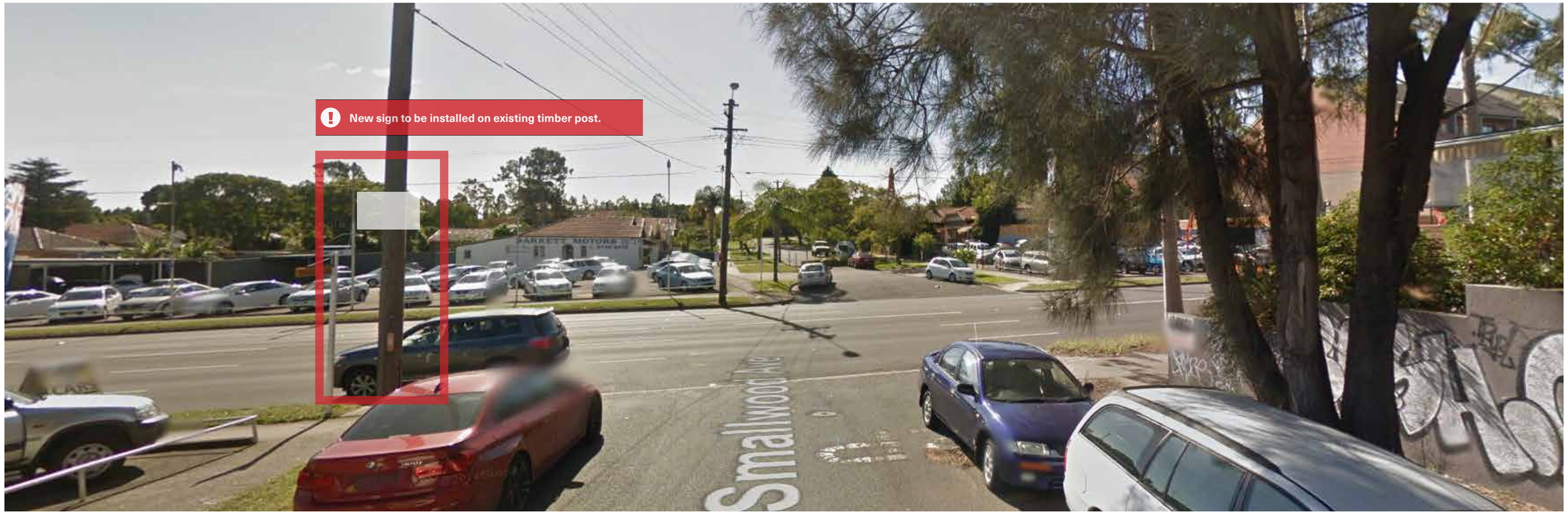
03 LEGEND | FINGER SIGN — SIDE A OF SIGN — SIDE B OF SIGN ▲ STREET VIEWPOINT LOCATION

04 SCHEDULE

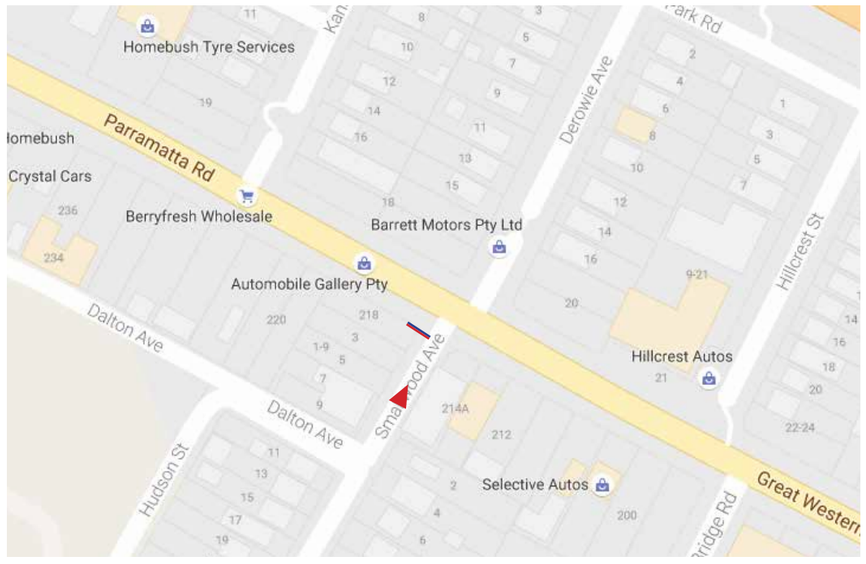
FLAG	DESTINATION (west face only)	TIME	DIST
→	Homebush (T)	2	750m
	Flemington (T)	3	800m
	Strathfield (T)	9	2.1km
	Burwood (T)	13	3.2km
	Cooks River Path	9	2.6km
	Botany Bay	1h 15m	21.4km

AT - STRATHFIELD		Project	Prepared by URBAN&PUBLIC	SIGNAGE LOCATION			SIGN NO	S_33
A1 **100%**	14 OCT 2016	NOTE		ADDRESS	SMALLWOOD AVE & PARRAMATTA RD		FILENAME	S_33.AI

01 STREET VIEW



02 SITE PLAN



03 LEGEND | FINGER SIGN — SIDE A OF SIGN — SIDE B OF SIGN — STREET VIEWPOINT LOCATION

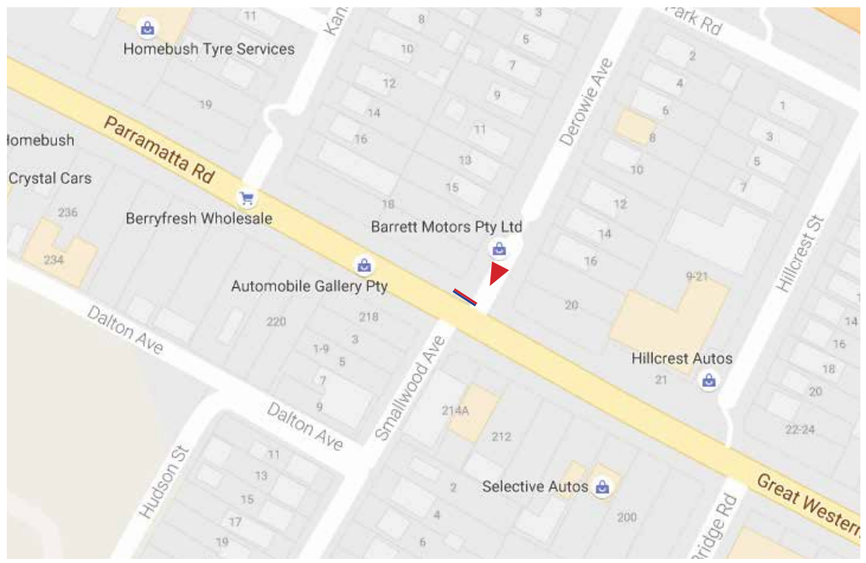
04 SCHEDULE

FLAG	DESTINATION (south face)	TIME	DIST
↑	Bicentennial Park	6	1.7km
	Olympic Park (T)	10	2.5km
	Parramatta Valley Cycleway	23	6.5km

AT - STRATHFIELD		Project	Prepared by URBAN&PUBLIC	SIGNAGE LOCATION			SIGN NO	S_34
A1 **100%**	14 OCT 2016	NOTE		ADDRESS	DEROWIE AVE & PARRAMATTA RD		FILENAME	S_34.AI

01 STREET VIEW

02 SITE PLAN



03 LEGEND | FINGER SIGN | SIDE A OF SIGN | SIDE B OF SIGN | STREET VIEWPOINT LOCATION

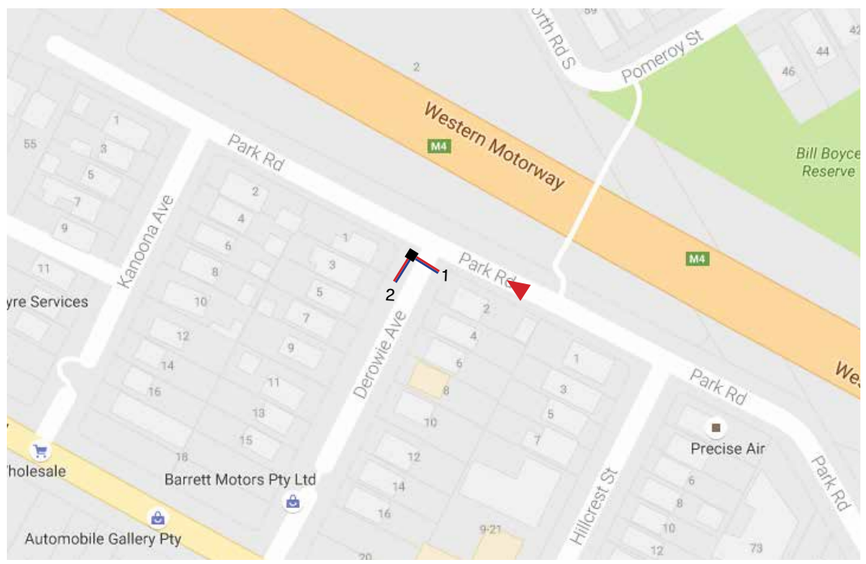
04 SCHEDULE

FLAG	DESTINATION (north face only)	TIME	DIST
→	Homebush (T)	5	1km
	Flemington (T)	5	1.1m
	Strathfield (T)	10	2.1km
	Burwood (T)	18	3.6km
	Cooks River Path	13	3km
	Botany Bay	1h 18m	21.7km

AT - STRATHFIELD		Project	Prepared by URBAN&PUBLIC	SIGNAGE LOCATION			SIGN NO	S_35
A1 **100%**	14 OCT 2016	NOTE		ADDRESS	PARK RD & DEROWIE AVE		FILENAME	S_35.AI

01 STREET VIEW

02 SITE PLAN



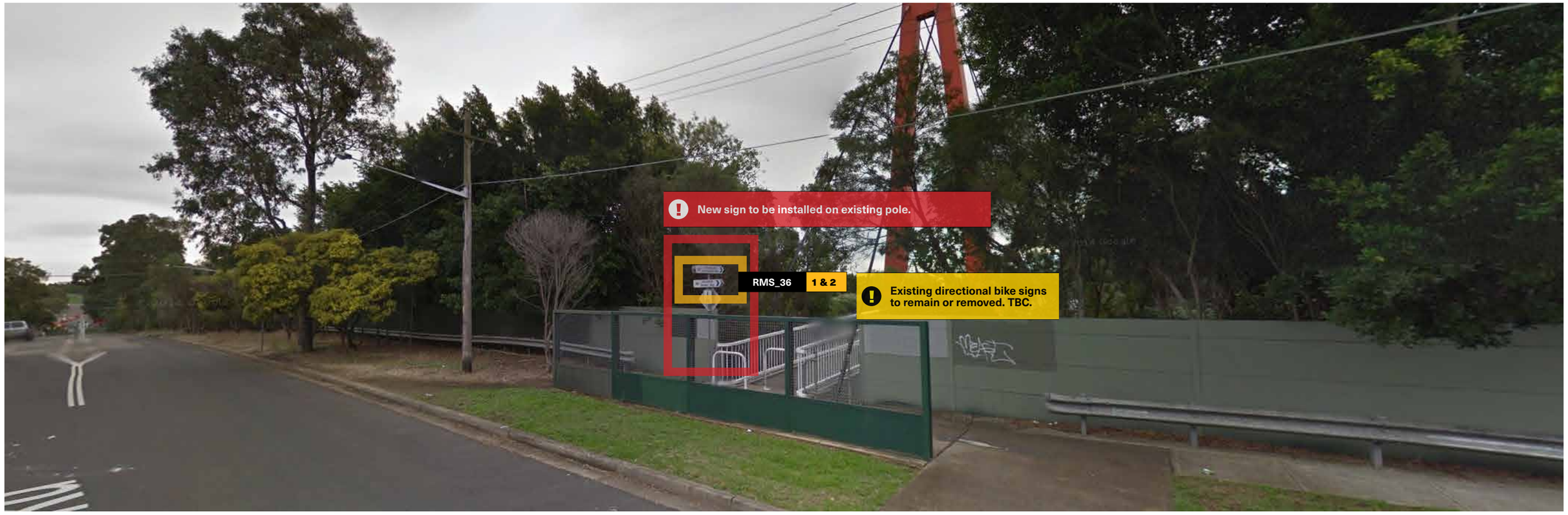
03 LEGEND | FINGER SIGN | SIDE A OF SIGN | SIDE B OF SIGN | STREET VIEWPOINT LOCATION

04 SCHEDULE

FINGER		DESTINATION	TIME	DIST
1A	←	Bicentennial Park	5	1.6km
		Olympic Park (T)	9	2.4km
		Parramatta Valley Cycleway	22	6.4km
2A	←	Flemington (T)	5	1.2km
		Strathfield (T)	10	2.2km
		Rookwood	11	2.4km
		Cooks River Path	13	3.1km
		Botany Bay	1h 18m	21.8m

AT - STRATHFIELD		Project	Prepared by URBAN&PUBLIC	SIGNAGE LOCATION			SIGN NO	S_36
A1 **100%**	14 OCT 2016	NOTE		ADDRESS	PARK RD & WESTERN MOTORWAY FOOTBRIDGE		FILENAME	**S_36.AI**

01 STREET VIEW



02 SITE PLAN

03 LEGEND | FINGER SIGN | SIDE A OF SIGN | SIDE B OF SIGN | STREET VIEWPOINT LOCATION

04 SCHEDULE

FINGER		DESTINATION	TIME	DIST
1A	←	Bicentennial Park	5	1.6km
		Olympic Park (T)	9	2.4km
		Parramatta Valley Cycleway	22	6.4km
2A	←	Flemington (T)	5	1.2km
	←	Strathfield (T)	10	2.2km
		Rookwood	11	2.4km
		Cooks River Path	13	3.1km
		Botany Bay	1h 18m	21.8m

05 EXISTING SIGN SCHEDULE

RMS_36		DESTINATION	TIME	DIST
1	←	Homebush		
		Homebush Bay		
2	←	Strathfield South		
		Botany Bay		

AT - STRATHFIELD		Project	Prepared by URBAN&PUBLIC	SIGNAGE LOCATION		SIGN NO	F_37
A1 **100%**	14 OCT 2016	NOTE		ADDRESS	POMEROY STREET & WESTERN MOTORWAY FOOTBRIDGE	FILENAME	**F_37.AI**

01 STREET VIEW

02 SITE PLAN

03 LEGEND | FINGER SIGN | SIDE A OF SIGN | SIDE B OF SIGN | STREET VIEWPOINT LOCATION

04 SCHEDULE

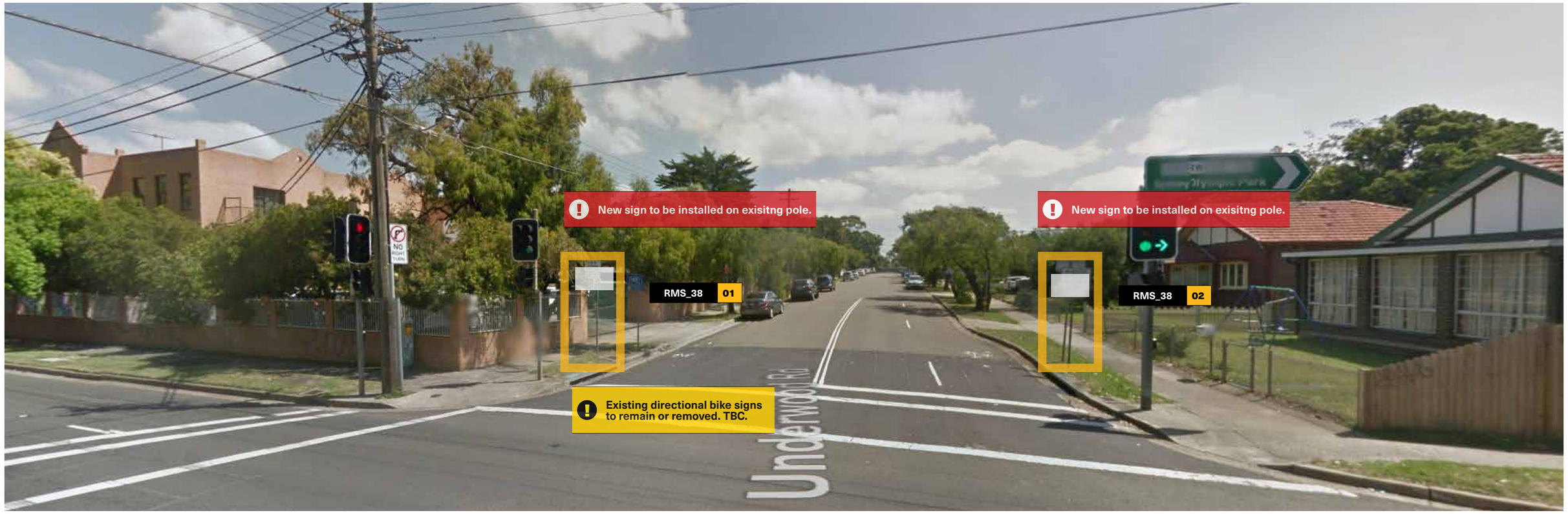
FINGER		DESTINATION	TIME	DIST
1A	←	Bicentennial Park	5	1.6km
		Olympic Park (T)	9	2.4km
		Parramatta Valley Cycleway	22	6.4km
2A	←	Flemington (T)	5	1.2km
		Strathfield (T)	10	2.2km
		Rookwood	11	2.4km
		Cooks River Path	13	3.1km
		Botany Bay	1h 18m	21.9km

05 EXISTING SIGN SCHEDULE

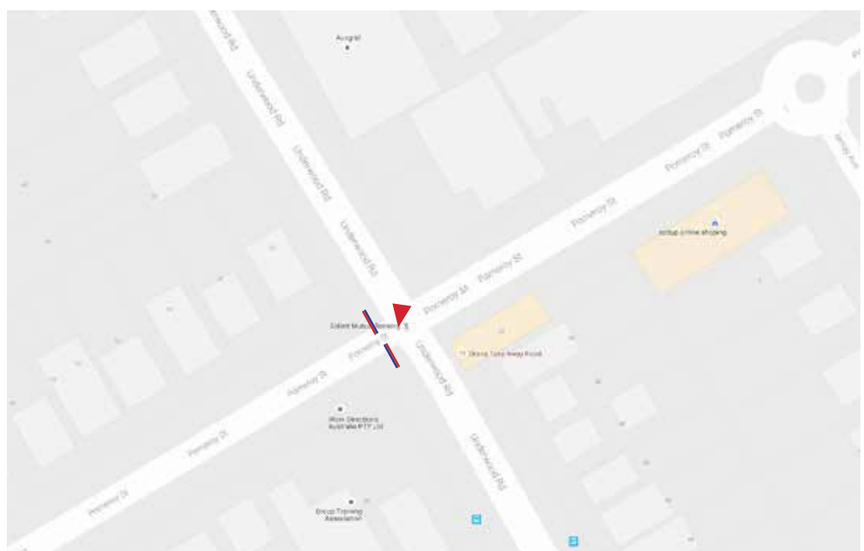
RMS_37		DESTINATION	TIME	DIST
1	←	Homebush		
		Homebush Bay		
2	←	Strathfield		
		Botany Bay		

AT - STRATHFIELD		Project	Prepared by	SIGNAGE LOCATION		SIGN NO	F_38 (A+B)
			URBAN&PUBLIC				
A1 **100%**	14 OCT 2016	NOTE		ADDRESS	CNR POMEROY STREET & UNDERWOOD ROAD	FILENAME	**F_38.AI**

01 STREET VIEW



02 SITE PLAN



03 LEGEND | FINGER SIGN | SIDE A OF SIGN | SIDE B OF SIGN | STREET VIEWPOINT LOCATION

04 SCHEDULE

	DESTINATION (east face)	TIME	DIST
↑	Strathfield (T)	13	2.8km
	Cooks River Path	13	3.4km
	Botany Bay	1h 18m	22km

	DESTINATION (west face)	TIME	DIST
←	Olympic Park (T)	7	1.9km
	Bicentennial Park	4	1.2km
	Parramatta Valley Cycleway	20	5.8km

05 EXISTING SIGN SCHEDULE

RMS_38		DESTINATION (west face)	TIME	DIST
1	←	Homebush		
		Homebush Bay		

RMS_38		DESTINATION (east face)	TIME	DIST
2	←	Strathfield		
		Botany Bay		

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Document Status

Revision	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
Draft A	O Peel	G McCabe	On file	G McCabe	On file	31/08/16
Draft B	O Peel	G McCabe	On file	G McCabe	On file	04/10/16
Final	O Peel	G McCabe	On file	G McCabe	On file	21/10/16

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