infraPlan

THE CITY of Unley

City of Unley Walking and Cycling Plan 2016–2021

June 2016

Project	The City of Unley Walking and Cycling Plan 2016-2021
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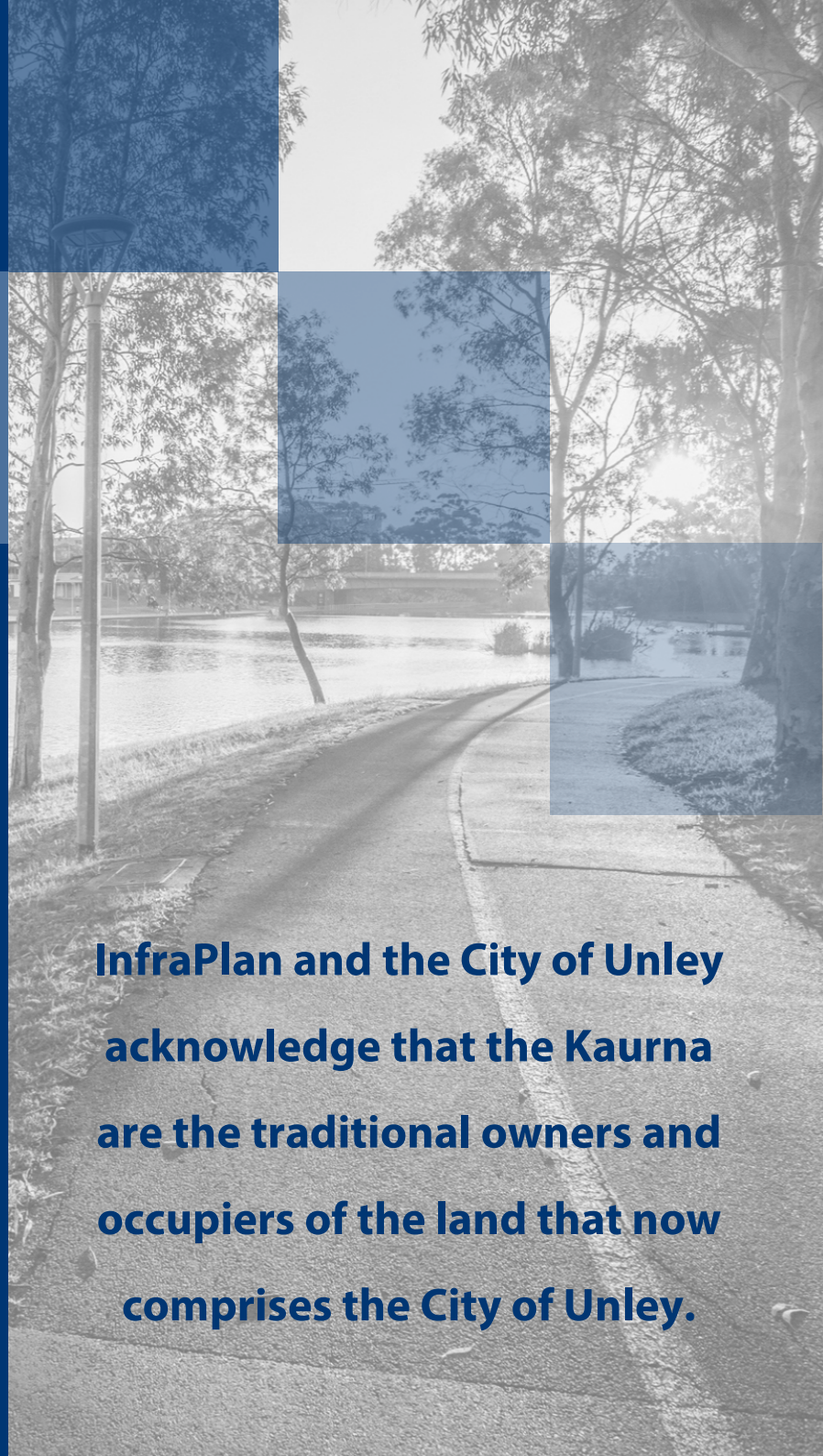
Issued by	Gayle Buckby

The Walking and Cycling Plan 2015–2020 is the City of Unley's strategy for walking and cycling infrastructure and programs to make the City safer and more attractive for current and future users.



InfraPlan and the City of Unley acknowledge that the Kaurna are the traditional owners and occupiers of the land that now comprises the City of Unley.

'Our city is recognised for its vibrant community spirit, quality lifestyle choices, diversity, business strength and innovative leadership.'

Contents

1. Introduction

A walking and cycling friendly city is one with less noise, cleaner air, healthier citizens and a stronger economy. It's a city that is a nicer place to be in, where individuals have a higher quality of life, accessibility is high and there is a simple route from thought to action to participate in social, cultural, work / leisure activities or buy locally. Active transport (a form of transport that involves physical activity) is therefore not a singular goal but rather an effective tool to use when creating a vibrant city with space for diversity and development.

Adelaide is one of the world's most liveable cities. Active transport supports our liveability status by taking pressure off public transport, reducing congestion and noise and supporting a zero carbon future. **The purpose of this Walking and cycling Plan is to outline actions that will assist people of all ages and abilities to choose active transport more often.**

Cyclists and pedestrians need to feel legitimate, safe and supported. Cyclists are particularly vulnerable where they share the road with moving vehicles. Research shows that in most cities, over half of the population is interested in cycling, but have some reservations about doing so (Figure 1).

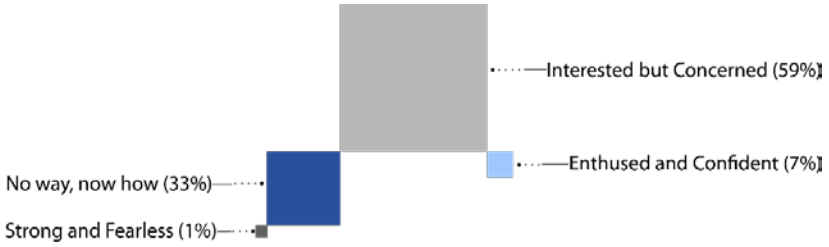


Figure 1: The four types of cyclists and potential cyclists (source: City of Melbourne Bicycle Plan 2012-2016).

Fortunately, it pays off to invest in urban cycling. Many local and international studies have defined the benefits gained when people walk or ride. Personal gains include health and fitness as well as less money spent on transport and parking, while overall economic benefits include a healthier community, less traffic congestion, reduced infrastructure costs, reduced greenhouse gas emissions, better air quality and noise reduction.

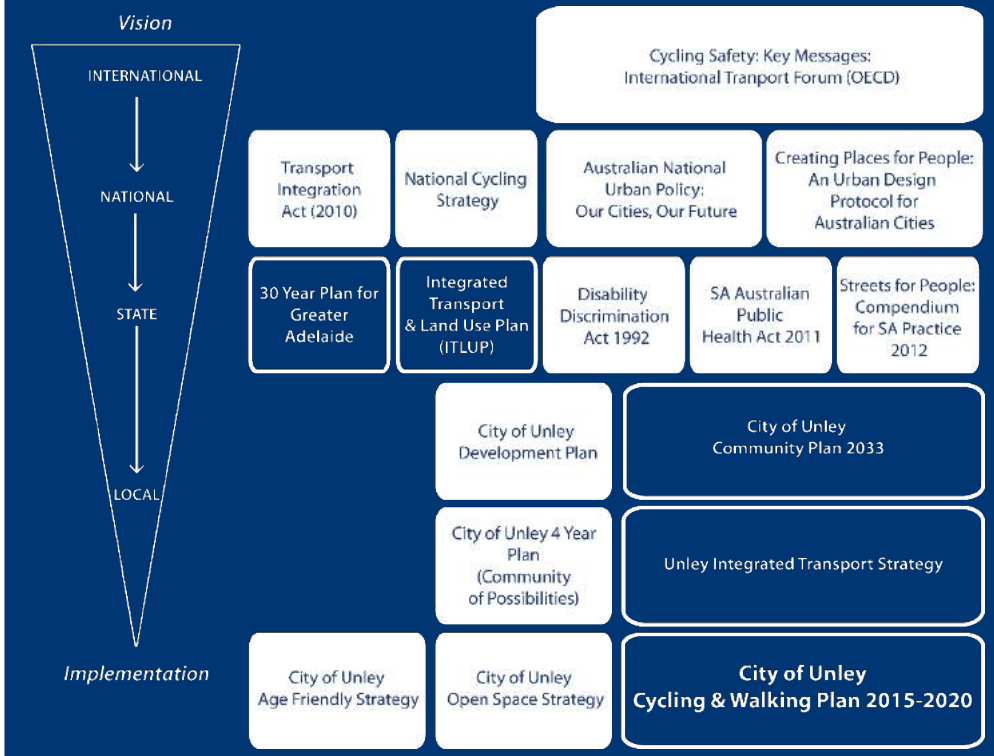
The City of Unley can be proud of its significant network of designated cycling routes, high quality infrastructure, traffic calmed streets and 40km/h local street speeds, all of which contribute to a great walking and cycling environment. While there has been a considerable effort to improve the walking and cycling environment, further work is needed for them to become more locally dominant modes of travel. By continuing this momentum, we strive to maintain the many positive interpretations about the City of Unley that contribute to it being a leader in liveability, innovation, sustainability and diversity. By aiming to be the best, we can lead the way and raise the bar for what is possible.

1.1. Background

The City of Unley Walking and cycling Plan 2015-2020 seeks innovative and practical actions to build on the existing networks and vision outlined in the 2005 Pedestrian and Bicycle Plan to make the City safer and more attractive for current and future users. The Plan has been prepared in support of key projects and strategies outlined across a suite of strategic documents.

- As the corresponding volume of the State Planning Strategy, the **30 Year Plan for Greater Adelaide** sets out the policies and targets aimed at managing growth and development within the region. The plan advocates active transport and recognises the environmental, economic, health, and social benefits.
- The **Integrated Transport and Land Use Plan** seeks to facilitate a more vibrant Adelaide and better connected South Australia and draws attention to active transport through extending cycling networks and catchments, and improving the accessibility and amenity of active transport routes (refer Figure 8 for future project map).
- The **City of Unley Community Plan 2033** identifies the priorities for the City over the next 20 years. The Plan is reinforced by 4 key goals: 'Emerging', 'Living', 'Moving' and 'Greening', which encourage an integrated walking and cycling network.
- This Plan has also been developed in response to the **Unley Integrated Transport Strategy**, which identifies a number of opportunities, constraints and strategies that seek to increase transport options and facilitate sustainable forms of transport, such as walking and cycling.

Strategic Overview

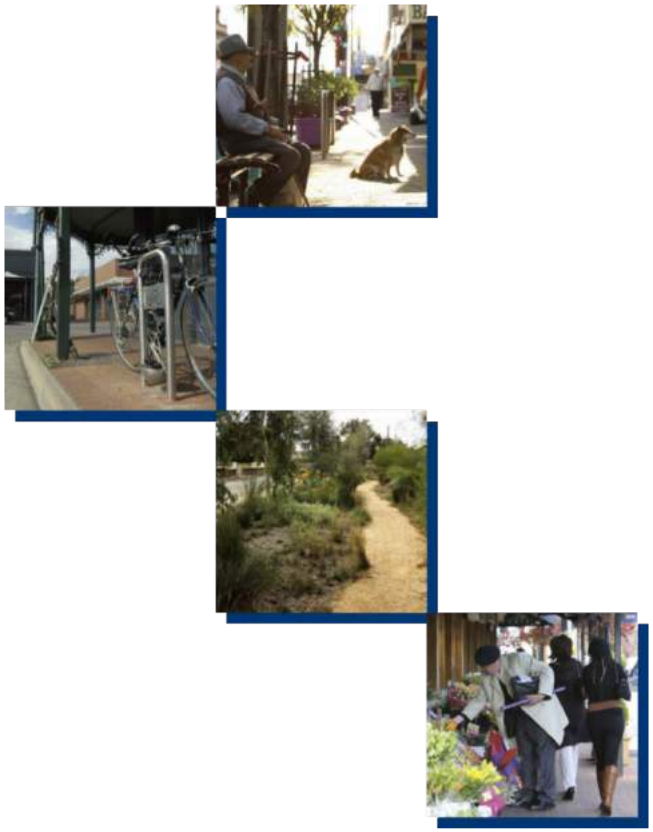


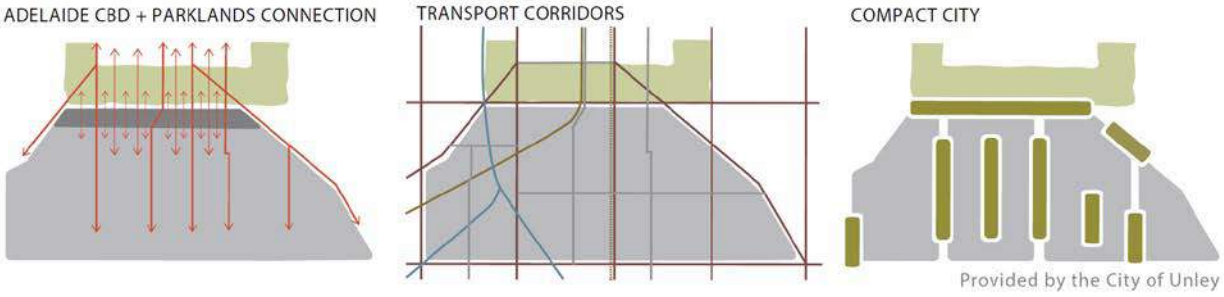
2. The City of Unley

With a population of around 39,000 (2014), the City of Unley is a vibrant and diverse inner-urban municipality. It joins the City of Adelaide immediately south of the Parklands. Its boundary is made up of major arterial roads (Anzac Highway, Cross, Glen Osmond, Greenhill and South Roads) with the local street network characterised by a grid. Major north/south arterials (Fullarton, Goodwood, King William and Unley Roads) intersect the council with strip centres that are integral to the economy and vibrancy of the City. However, Adelaide's north/south growth has exposed the City to heavy regional and sub-regional traffic. Commitment to seek a balance between transport modes, demands and the protection and enhancement of local amenity and accessibility underpins this Plan.

With South Australia's highest population density (27 persons/ha), the City of Unley is ideal for walking and cycling. It has a Mediterranean climate, relatively flat terrain and most services provided within short distances. Unley's close proximity to Adelaide's central business district – around 4km – represents an easy ride for able-bodied residents who work in the city, as well as bus, tram and train routes that encourage walking and cycling components.

The City of Unley is also recognised by the World Health Organisation as an Age Friendly City and Community. Ensuring accessibility for all ages is critical to uphold this status. Providing safe walking and cycling networks delivers low impact opportunities for physical activity, improved health, well-being, socialisation and inclusion.





Provided by the City of Unley

OUR COMMUNITY

Source: .id City of Unley

TOTAL POPULATION

36,842

MEDIAN AGE

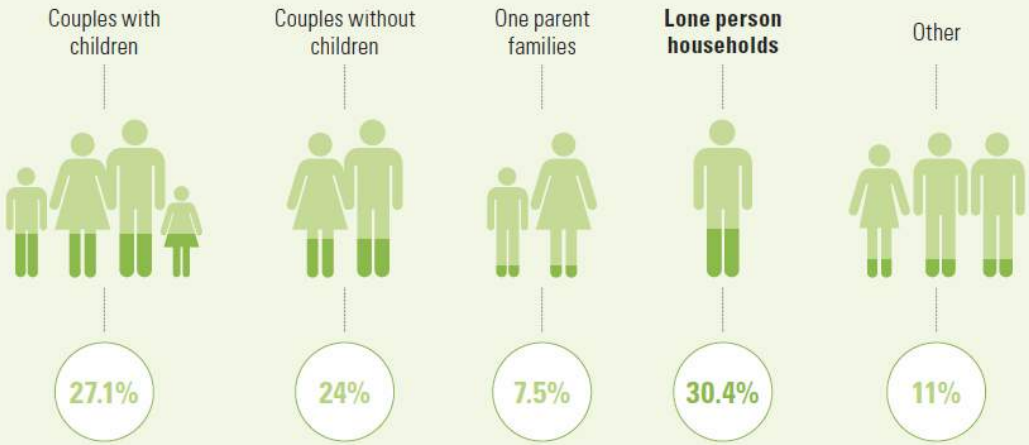
39

NEW RESIDENTS

11,257 since 2006.

30%

HOUSEHOLD TYPES



SNAPSHOT

Prosperous yet not necessarily a wealthy community.

High average income

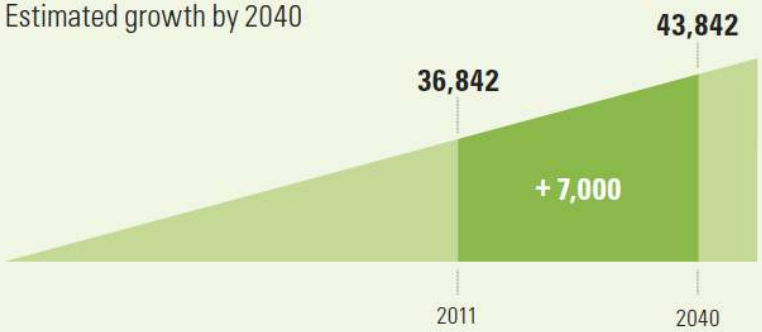
Low unemployment

High education

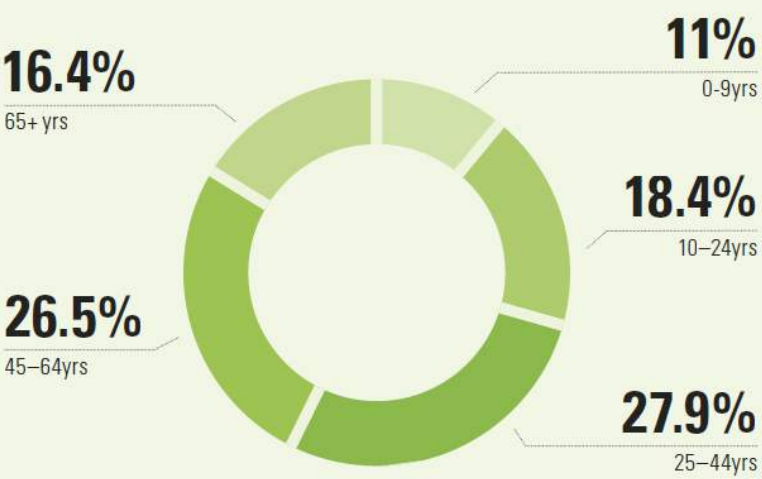
High housing mortgages

INCREASING POPULATION

Estimated growth by 2040



AGE SEGMENTATION



INTERNET ACCESS

Most are broadband connections.

MEDIUM DENSITY HOUSING MEDIAN

Compared to greater Adelaide.

INCREASING CULTURAL DIVERSITY

HIGH VEHICLE USAGE

45.4% of households have two or more vehicles.

3. Walking and Cycling in Unley

The City of Unley has a busy and comprehensive walking and cycling network. Traffic calming measures and 40km/h precincts contribute to an accessible and enjoyable walking and cycling environment. The existing street network has footpaths on both sides and the shared paths provide both enjoyable and practical walking routes.

The latest Census data from 2011 indicates that the percentage of Unley residents walking and cycling to work is higher than other Adelaide Metropolitan Council areas. Unley has a significant proportion of its population in the key cycling age bracket of 10-64 (higher than the State average), which combined with its near city location, is likely to contribute to more people cycling.

Figure 4 illustrates the origin of the resident labour force who cycled to work (3.9%, including cycling to available public transit stops). This is in contrast to the 1.3% recorded across Greater Adelaide. It is important to note the higher concentration of these riders live near the off-road network.

Figure 5 illustrates the origin of Unley residents who walk to work (15.45%, including walking to public transport stops). Again, there are concentrations near shared paths, high frequency public transport corridors and typically within closer proximity of the Adelaide CBD.

3.1. The Challenge of Increasing Active Transport

Increasing the number of walking and cycling trips to, from and within the City of Unley is achievable. For round-trips less than two kilometres, walking is the preferred mode of transport although bikes can easily be used for short trips. For trips longer than two kilometres, cycling is ideal as it reduces congestion and pollution and takes pressure off motorised transport networks. Given Unley's proximity to the Adelaide CBD, the average round-trip length to and from the City of Adelaide is about eight kilometres. Trips within the municipality average around three kilometres. **The challenges that community faces include balancing the regional through traffic with a safe local walking and cycling network for users of all ages, confidence levels and abilities (refer to Figure 3 for the various types of cyclists), and finding ways to move people from cars and public transport to bicycles for longer trips.**

Figure 2: The four cycling domains (source: *Bicycle Victoria, Bike Plan Workbook).*

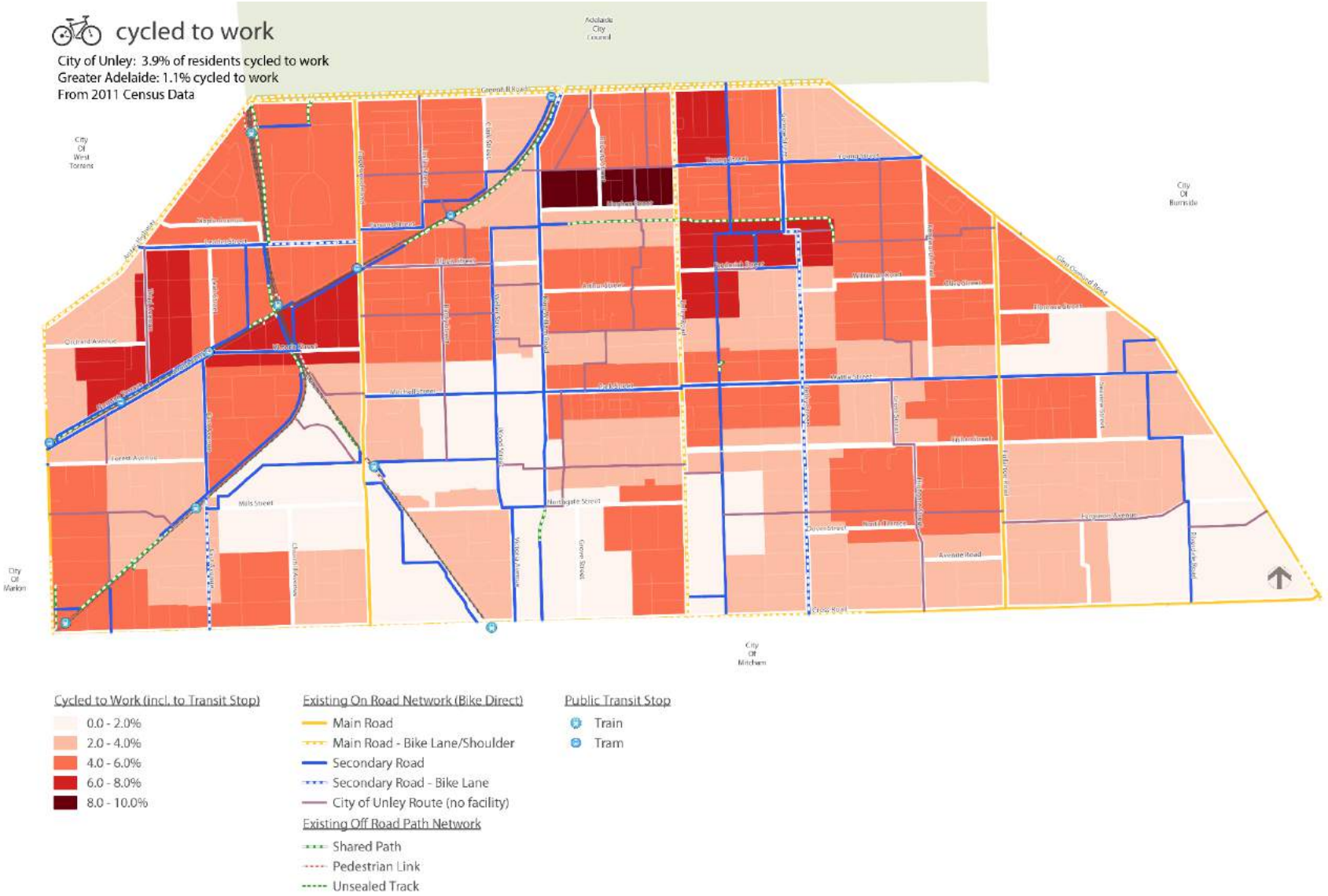


Figure 3: Percentage of the City of Unley's resident labour force who cycle to work (data source: 2011 Census, ABS).

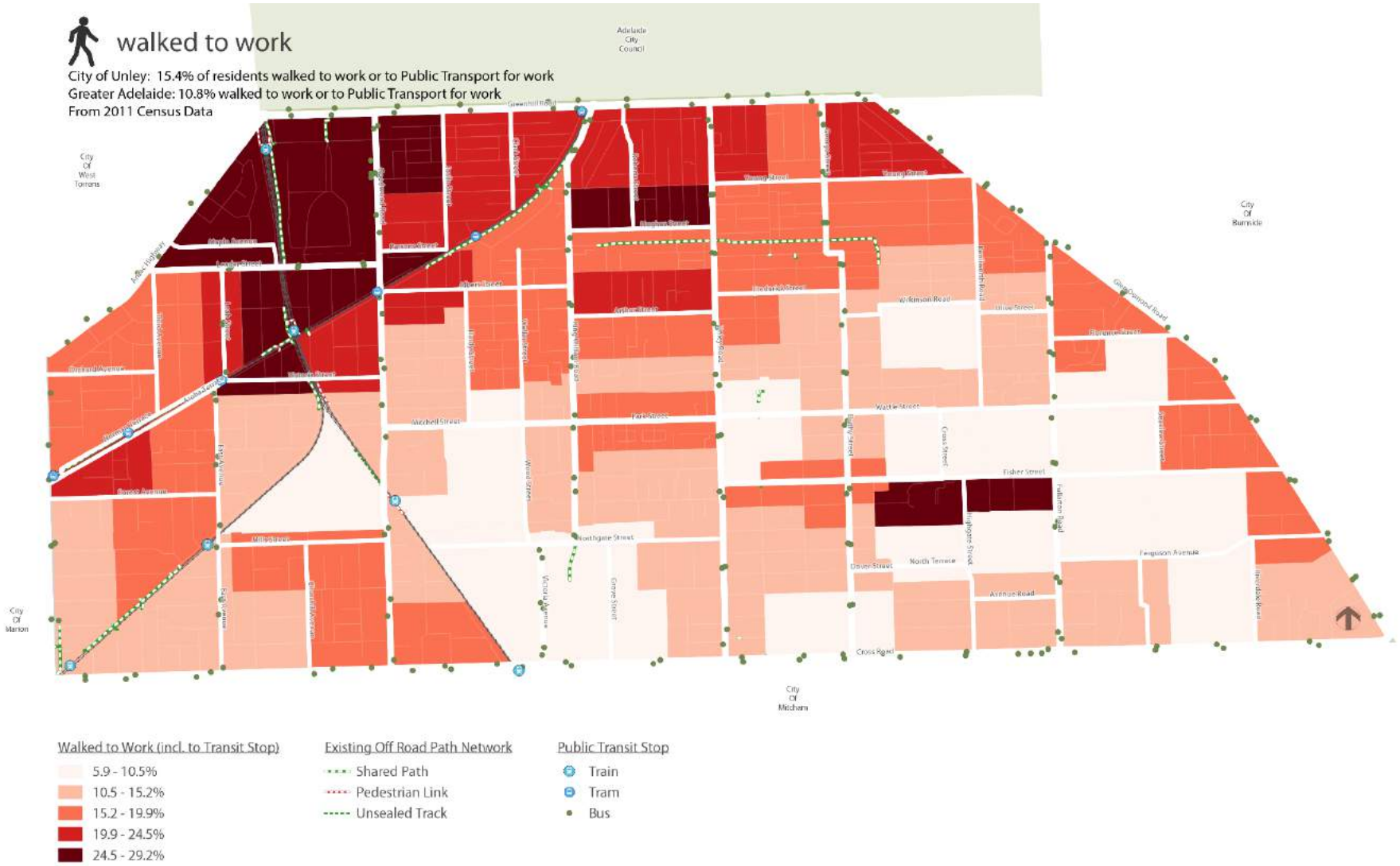


Figure 4: Percentage of the City of Unley's resident labour force who walk in full, or as part of their journey to work (data source: 2011 Census, ABS).

3.2. Cyclist Counts

Results from the City of Unley's 2014 and the Adelaide City Council's 2015 Super-Tuesday cycling counts have been mapped in Figure 6. Key findings within the City of Unley are as follows:

- The **Mike Turtur Bikeway**, which starts/finishes at King William Road is the busiest commuter cycle route in Adelaide.
- The busiest site in the City of Unley was the **intersection of Railway Terrace South, Devon Street South and Railway Underpass** with a total of 346 riders.
- **Railway Terrace** is a key north-east commuter route and **Porter Street and King William Road** are key north-south commuter routes
- The **intersection of Greenhill Road and King William Road** (start/finish of Mike Turtur Bikeway) recorded the highest number of cyclists of all count locations, with 661 commuters between 7-9am. This busy route is likely to continue to increase with its extension from South Terrace to Victoria Square (current Adelaide City Council/DPTI joint project).
- **Porter Street** now has the benefit of a new crossing on Greenhill Road and an upgraded Park Lands path leading to the Adelaide CBD. According to Adelaide City Council's 2015 Super Tuesday counts, the number of cyclists travelling from Porter Street to the Park Lands increased from 227 to 290 (28%), which means that Porter Street is now the most popular suburban street for cyclists commuting to the CBD.

Case Study — Yarra City Council, Victoria

Although the City of Unley can be proud of the highest cycling numbers in Adelaide (3.9%), these figures are still low in comparison to other inner-city Council areas, such as the Yarra City Council in Melbourne's inner-north, which has 14% of residents cycling to work.

Yarra is ambitious in its approach to cycling infrastructure, setting high targets such as in their 2010 cycling plan to provide at least 5 separated on-road bike routes, 5 major off-road bike route upgrades, removing car parking in 15 locations to be replaced by bike parking by 2013. The council also committed in following the cities of Melbourne and Copenhagen in publishing a regular 'Bike Account' in order to monitor, evaluate and communicate its progress in meeting the objectives.

Along with infrastructure spend, the Yarra City Council's planning objectives also assist in reducing reliance on private vehicles by requiring 'all new developments to prepare and implement integrated transport plans to reduce the use of private cars and to encourage walking, cycling and public transport'. However, Yarra City Council has a long-term policy of refusing to issue on street parking permits to residents of developments constructed after December 2003 if the construction increased the number of dwellings on the site. This seeks to shift accountability for meeting the parking or transport needs of future residents to the developer. This can then be achieved by providing bike parking facilities, on-site car parks or allocated spaces for shared cars.

Bicycle Expenditure Index — BiXE

The Bicycle Expenditure Index (BiXE) was an annual publication showing generally how much money a local government spent on bicycle infrastructure. It stated that a $5 spend per resident indicated a meaningful commitment to bicycle infrastructure.

The 2012 BiXE reported that the City of Unley spent $1.16 per person on cycling infrastructure. In 2014/15, the City of Yarra allocated $2.79 million on bicycle infrastructure which equated to $32/ person on the following works:

- $740,000 on new bicycle paths in open space
- $420,000 on renewing bike paths in open space, and
- $1.01 million on on-road bike projects

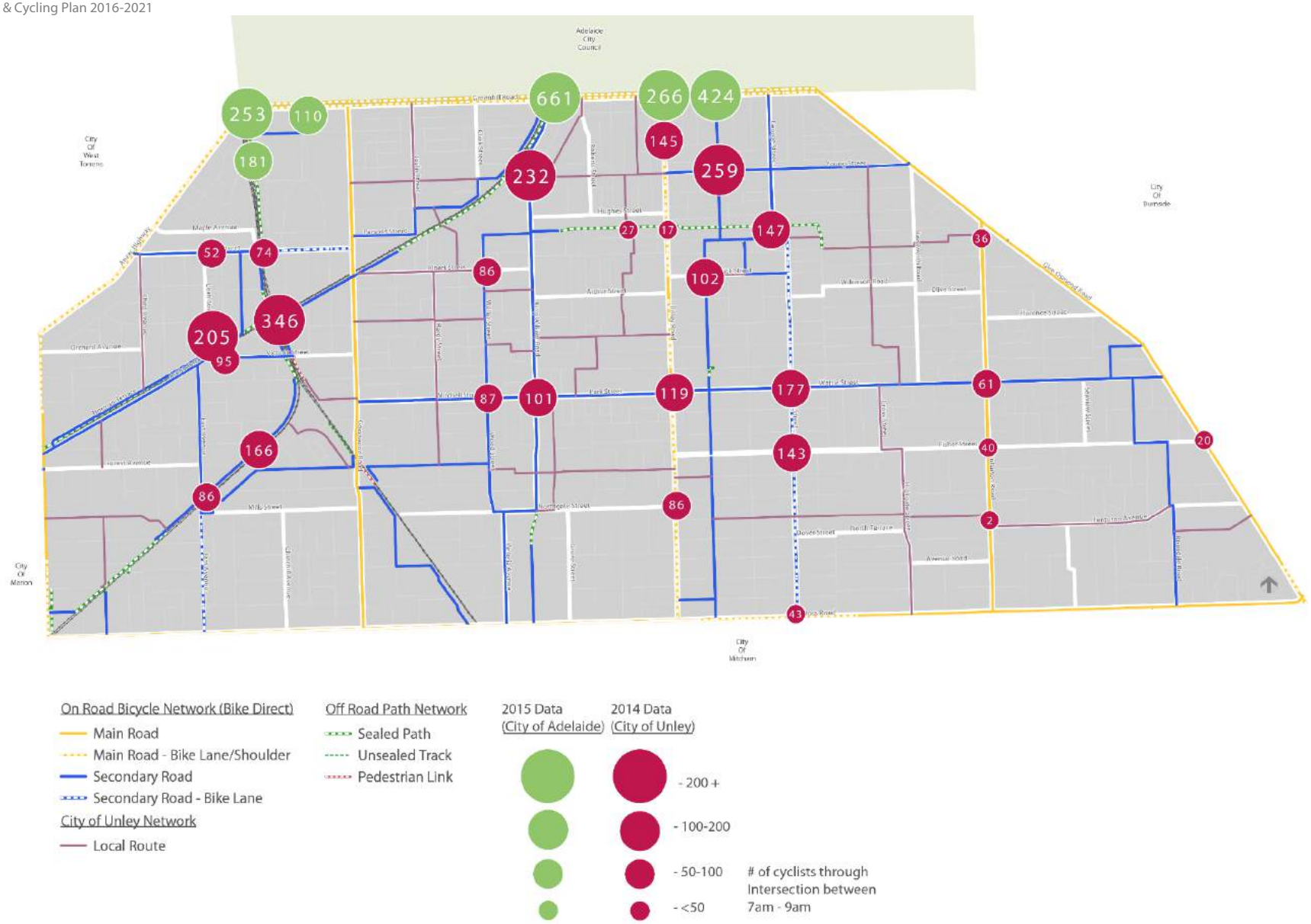


Figure 5: Cyclist counts at intersections (includes all legs of intersection).

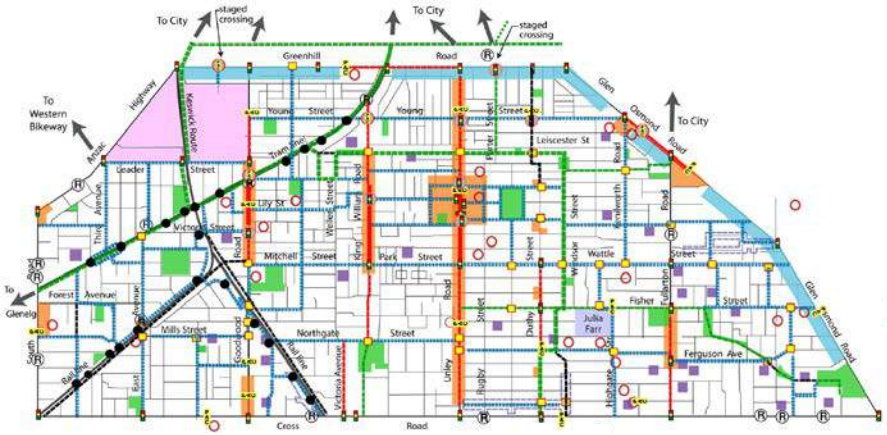
3.3. The 2005 Pedestrian and Bicycle Plan

The 2005 Pedestrian and Bicycle Plan was prepared within the context of the Unley Integrated Transport Strategy. The Plan was underpinned by the 'City of Villages' vision, with cyclist and pedestrian networks that linked villages, schools, workplaces and local shops with the surrounding residential areas and into neighbouring Council areas.

Council and DPTI have rolled out significant walking and cycling infrastructure since 2005, focusing on shared path construction. Separation of cyclists from motorists has resulted in more enjoyable cycling trips and Adelaide's highest numbers of people cycling to work (refer section 3).

However, there are still some missing links in the networks. Issues such as cyclists mixing with high traffic volumes/speeds, routes ending at a busy road without a safe crossing point and missing/illegible signage and wayfinding. In addition, some sections of shared path are in poor condition with a lack of lighting.

2005 Pedestrian Network



2005 Bicycle Network

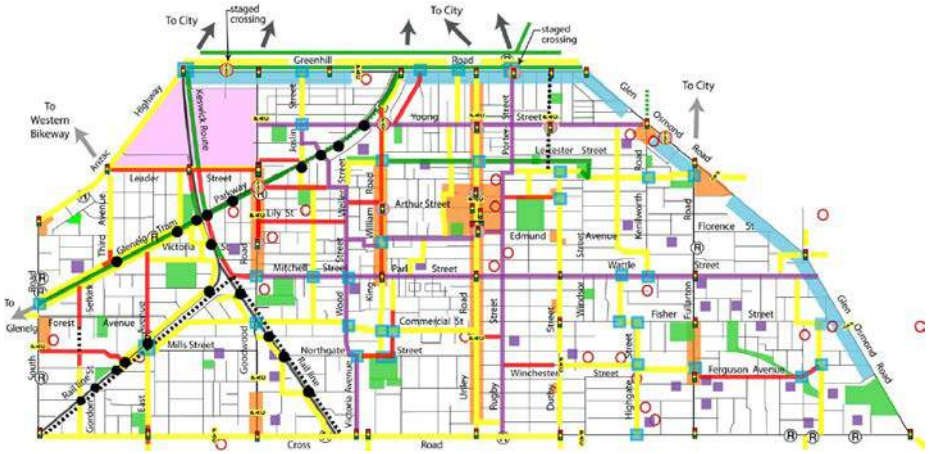


Figure 6: Walking and cycling network maps from the City of Unley Pedestrian and Bicycle Plan 2005 (QED).

3.3.1. Projects undertaken since the 2005 Pedestrian and Bicycle Plan

Below is a summary of key Council and/or DPTI projects that have updated the walking and cycling networks and/or facilitated a change in local walking and cycling movements:

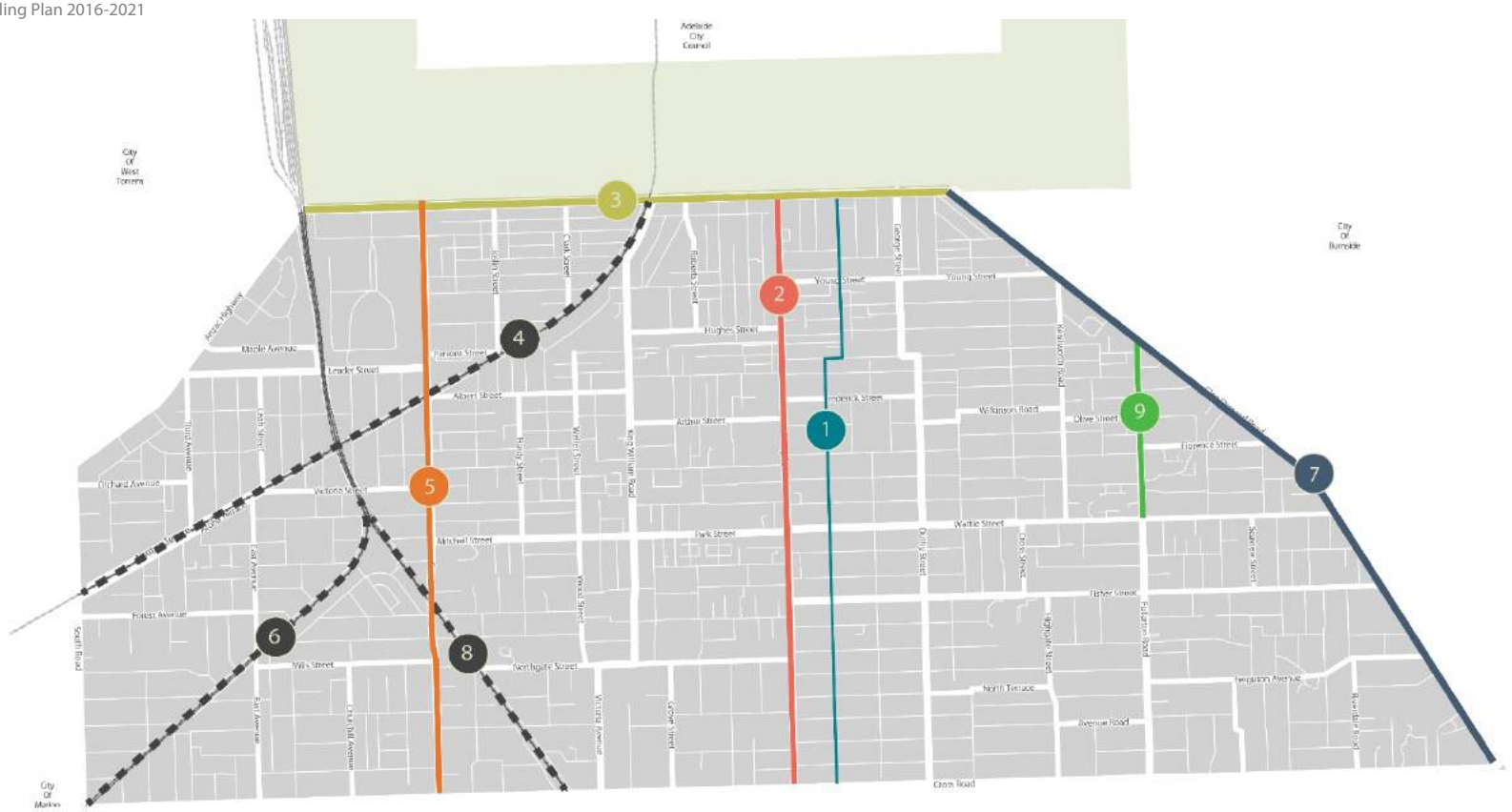
- Mike Turtur Bikeway – Shared Path along the Glenelg Tramway.
- Marino Rocks Greenway – shared path along the Seaford rail line.
- Shared Path underpass at the Greenhill Road/Anzac Highway intersection – links to West Terrace shared path.
- Culvert Street shared path (part of Glen Osmond Creek).
- Sharrows on Victoria Street between Marino Rocks Greenway and Mike Turtur Bikeway.
- Greenhill Road median refuges at Porter Street, Clark Street, Roberts Street & Joslin Street.
- Pedestrian Actuated Crossings at Greenhill Road / Hamilton Boulevard.
- Shared use path adjacent to the South Road tram overpass.
- New Wayville Station, including pedestrian overpass of the rail line, just south of Greenhill Road.
- New Pedestrian crosswalk at Anzac Highway/Greenhill Road intersection (south leg).
- Installation of Bike Repair Stations. (King William Road / Mike Turtur Bikeway, King William Road / Hughes Street, Little Charles Street/King William Road).
- Reopening of Millswood railway station.
- Goodwood Junction rail upgrade, with new shared path on the western side and pedestrian path on the eastern side.

3.3.2. Current and future projects

A number of projects are proposed by Council and/or DPTI in the near future that have been reflected in the updated walking and cycling networks.

- A Cyclist & Pedestrian bridge will be built over the train line at Goodwood. This $10m Government project will connect the Mike Turtur Bikeway from Railway Terrace North, in Goodwood, to Norman Terrace, Forestville and would include work to improve access to Goodwood station.
- Rugby Street / Porter Street Bicycle Boulevard (currently being designed, and therefore not part of this Plan)
- Leader Street bicycle lanes – Keswick Route to Anzac Highway (2015/16)
- Pedestrian Actuated Crossing at Porter Street / Greenhill Road (DPTI Blackspot program 2016)
- Simpson Parade Shared Path
- Joslin Street Route: street-scaping
- Cross Road – bicycle lanes from Glen Osmond Road to West Terrace

In addition, the Integrated Transport and Land Use Plan (ITLUP) has identified future projects that have potential to improve safety and amenity for people who walk and/or ride. This could increase the number of residents who choose to walk and ride, including an uptake of walking to public transport. These are illustrated in Figure 8.



Future Upgrades by Integrated Transport and Land Use Plan (ITLUP)

1 **Rugby Street/Porter Street**
Complete the Belair– City Bikeway, including crossings of arterial roads.
Time frame: next 5 years

3 **Greenhill Road**
Improve the efficiency and safety of the Inner Ring Route, including intersection and mid block upgrades.
Time frame: within 5-15+ years

5 **Goodwood Road**
Targeted upgrades of key intersections and sections of road to improve efficiency and safety performance, On-road bus priority measures & Mike Turner Bikeway
Time frame: within 5-15+ years

7 **Glen Osmond Road**
Targeted upgrades of key intersections, sections of road to improve efficiency and safety performance, on-road bus priority measures and construct bus 'Super Stops'.
Time frame: within 5-15+ years

9 **Fullarton Rd (Glen Osmond Rd to Wattle St)**
Targeted upgrades of key intersections and sections of road to improve efficiency and safety performance.
Time frame: within 5-15+ years

2 **Unley Road**
Targeted upgrades of key intersections and sections of road to improve efficiency and safety performance.
Time frame: within 5-15+ years

4 **Glenelg Tramline**
Increase service frequencies and increase tram size and tram fleet.
Time frame: within 5-15+ years

6 **Seaford line/Tonsley Line**
Increase service frequencies, review, upgrade and extend train stations and platforms.
Time frame: within 5-15+ years

8 **Belair Trainline**
Electricity with new electric trains – increase service frequencies.
Time frame: 15+ Years

Figure 7: Future DPTI projects and upgrades as outlined in the State's Integrated Transport and Land Use Plan (ITLUP).

4. Consultation

The public consultation strategy for the review of the 2005 Pedestrian and Bicycle Plan was undertaken in two stages:

- Stage 1: Workshop with the Unley Bicycle User Group (Unley BUG).
- Stage 2: Request for feedback on the Draft Plan – open to anyone interested.

4.1. Unley Bicycle User Group Workshop

A workshop with the Unley BUG was held on 22nd September 2015, with eight members (including one Councillor) and three Council staff attending. InfraPlan presented the findings and First Draft of the proposed network followed by a workshop discussion. The Draft Plan was updated to reflect this feedback where possible. The issues raised at the workshop and InfraPlan's responses are included in the appendices.

Figure 8: The Unley BUG workshop, 22nd September 2015.

4.2. Consultation of Draft Plan

The Draft Cycling and Walking Plan was available on Councils 'Your Say' website from April 4 to May 17, 2016. A feedback form (refer Figure 10), was provided and advertised on the Council website, The Eastern Courier and 'Unley Life'. In addition, posters were distributed to various community facilities and posted at locations where there are high cyclist volumes, such as Greenhill Road / Porter Street junction.

There were 94 responses to the survey, of these 76 people supported the plan and 18 did not.

Respondents noted that there was some concern that the Plan focussed more on cycling than walking and that the Plan was difficult to understand in parts. Approximately three respondents called for cycling on footpaths to be banned, but others considered cycling on footpaths acceptable as long as there is sufficient width and appropriate signage provided.

There were a number of respondents who had concerns regarding the Porter Street / Rugby Street Bicycle Boulevard. However, it is noted that this consultation will be undertaken separately and is not part of this project. Respondents were asked to list the three most important improvements, based on their experience. The key issues from this question are listed in Table 1, and informed the prioritisation of the actions to be undertaken in the first 5 years (refer Section 12).

FEEDBACK FORM

Your Say THE CITY of Unley

DRAFT WALKING AND CYCLING PLAN 2016-2021

We are seeking your comments on the draft Plan and the networks proposed. Feedback will be received until 29 APRIL 2016, and will be considered by Council's Transportation and Traffic team as the proposed networks are finalised and actions are prioritised.

Please provide your contact details (optional)*

Name*

Address

Email*

Phone number*

You can complete this form online at:
yoursay.unley.sa.gov.au

Return this form by 29 APRIL 2016 by:
- Posting to Draft Walking and Cycling Plan, City of Unley, PO Box 1, Unley SA 5061
- Emailing to pobox1@unley.sa.gov.au
- Submitting it in person at the Civic Centre at 181 Unley Road, Unley

yoursay.unley.sa.gov.au

1. DO YOU SUPPORT THE DRAFT PLAN IN GENERAL?
YES NO

2. DO YOU AVE ANY COMMENTS ON THE PLAN?

3. WHAT TIME FRAME DO YOU CONSIDER APPROPRIATE TO ACHIEVE THE DESIRED NETWORK?
5 YEARS OR LESS 6-7 YEARS
8-9 YEARS 10 YEARS OR MORE

4. BASED ON YOUR EXPERIENCE WALKING AND CYCLING IN THE AREA, WHAT DO YOU CONSIDER THE THREE MOST IMPORTANT IMPROVEMENTS THAT COULD BE MADE?

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Telephone (08) 8372 5111
Facsimile (08) 8271 4886
Email pobox1@unley.sa.gov.au
Website www.unley.sa.gov.au

Figure 9: Feedback form for the Draft Walking and Cycling Plan

Consultation of Draft Plan: Most important Improvements	No. of respondents
Signage: Etiquette signage on shared paths and footpaths, and wayfinding signage city-wide	20
Footpath maintenance: City-wide improvements for smooth road and footpath surfaces, removal of debris & overgrown foliage, and removal of footpath clutter	18
Reduce traffic speeds / enforce existing speed limits	11
Enhanced Bike Lanes: Green coloured and chevron marking	8
Maintain high quality line marking on bike lanes and shared paths	8
King William Road: Complete safe connection from Mike Turtur Greenway to Greenhill Road & improve crossing at Greenhill Road	7
Concerns and improvements for Porter / Rugby Bicycle Boulevard (note: consultation for this will be undertaken separately and not part of this Plan)	7
Improve lighting on shared paths	6
Glen Osmond Creek Shared Path (note: although there was support for this path, there were 3 respondents who did not support the path and would prefer walking only)	6
Improve crossing at Greenhill Road / Porter St (note: DPTI are currently undertaking these works)	5
Roundabout upgrades for safety	3
Improve safety at East Avenue rail and tram crossing	3
Crossing at King William Road / Glen Osmond Creek Greenway	3

Table 1: Table 1: Most important Improvements - from Draft Plan consultation

‘Against the backdrop of a growing population, the highest ever obesity levels and significant environmental challenges – cycling offers a wealth of benefits.’

-Austroads

5. Updating the Cycling Network

Cycling related research and the design of cyclist infrastructure has been rapidly evolving, with surveys Australia-wide showing that feeling unsafe due to traffic speed and volume is a key reason for not cycling. This plan aims to encourage more people to cycle more often, and focuses on providing stronger separation between vehicles and bicycles on busy roads and providing low-traffic bikeways that are practical alternatives to busy roads. A snapshot of typical recommendations are illustrated in Figure 11.

The 2015-2020 cycling network is comprised of five route categories as follows:

Low-Traffic Bikeways. These routes are located on residential streets. North-south and east-west routes run parallel to, and in-between each main road. Traffic calming is recommended on these routes where required, and road crossing facilities are recommended where the route crosses roads that carry 5,000 vehicles per day or more. These routes are named intuitively, e.g. 'Unley Park to City Bikeway', and identified by high quality directional signage at every turn. The low-traffic cycling network is illustrated on Figure 12.

Cycle Corridors. These routes are the choice of many cyclists due to their direct and fast alignment. Cyclist separation (bicycle lanes) is required on these routes due to higher traffic volumes and speed (e.g. Duthy St, Leader St), but do not fit on all of these routes due to current road widths (e.g. Wattle Street, Park Street). Recommendations include installing bicycle lanes where possible, strengthening existing bicycle lanes with buffer zones, calming traffic where required and improving road crossings. Long-term projects are also recommended, such as street-scaping of Wattle Street and Park Street to include bicycle lanes at the time when the existing trees reach the end of their life.

Greenways/Shared Paths. These are iconic routes that are used for commuting as well as recreation. They link to other existing greenways and shared paths to form long and continuous off-road routes throughout the City of Unley. The updated network includes an extension of the Glen Osmond Creek route from Windsor Street to Ridge Park to provide off-road cycling opportunities for residents in the south-eastern side of the City of Unley where currently none exist; a Greenway along the Belair rail line, and upgrading the surface and lighting along some existing routes.

Main Roads. These include all the arterial roads maintained by DPTI as well as King William Road and Victoria Avenue, maintained by Council. They are the most direct routes for all transport modes, and are therefore the choice of many confident cyclists. DPTI have installed bicycle lanes (generally part-time) on these roads where they fit, but the high traffic volumes on Goodwood Road and Glen Osmond Road make the installation of bike lanes difficult. Recommendations include continuous footpaths across side streets, increasing Clearway hours to extend bicycle lane accessibility, central median islands for mid-block pedestrian crossings and reducing traffic speed limit to 40km/h through areas of high pedestrian activity (Unley Central and Goodwood Rd between the rail line and Angus Street).

Local Links. These links are short route sections that provide important links between the key routes and destinations. They are on low traffic streets, and traffic calming is recommended where required.

Low Traffic Bikeway

> Designed for people who do not like riding on busy roads + to encourage new cyclists
> On streets with low traffic volume + speed
> Safe road crossings at busy intersections
> Direction signage at every turn
> Not always the most direct route

Cycling Corridor

> Direct routes on collector roads with bicycle lanes
> Bike lanes buffered from car doors + adjacent traffic
> Green coloured lanes at hazardous locations

Greenway/Shared Path

> Safe, off-road routes
> Upgrade existing paths whereuneven surfaces or poor lighting
> Extend Glen Osmond Creek route to Ridge Park (long-term project)
> Construct Simpson Parade culvert shared path (missing link from King William Rd to Mike Turtur Bikeway)

Main Roads

> The fastest route for confident cyclists
> Cycle lanes not always possible
> Construct continuous footpaths across junctions
> Lobby DPTI for 40km/h through Activity Centres + extended Clearway operating times

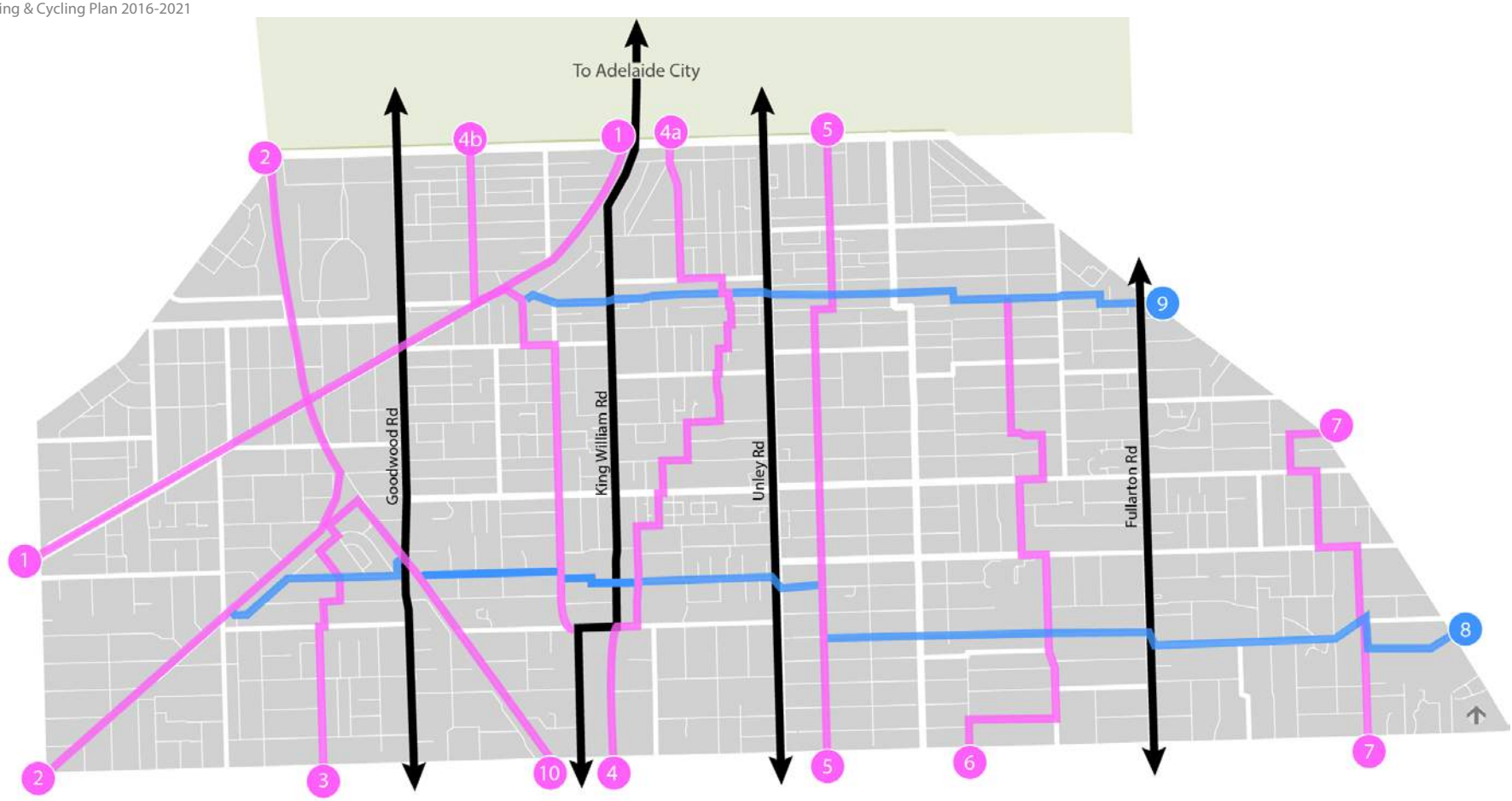
Wayfinding

> Develop consistent signage strategy
> Update + distribute cycling maps

Etiquette + Safety

> To reduce conflict between pedestrans and cyclists on shared paths and footpaths
> Install messages using pavement stickers and / or signage

Figure 10: Recommendations for cycling.



Proposed Low-Traffic Bikeway & Greenway Network

- 1 Mike Turtur Bikeway
- 2 Marino Rocks Greenway
- 3 Clarence Park - City Bikeway
- 4a Unley Park - City Bikeway (Via Unley)
- 4b Unley Park - City Bikeway (Via Goodwood)
- 5 Belair - City Bikeway (Rugby/Porter)
- 6 Malvern - Parkside Bikeway
- 7 Myrtle Bank Bikeway
- 8 Malvern East-West Bikeway
- 9 Unley East-West Bikeway
- 10 Belair Line Greenway

North-south Bikeways

East-west Bikeways

Figure 11: Low-Traffic Bikeway & Greenway Network.

6. Cyclist Safety

Streets with less traffic and slower speeds move at a human pace and contribute to a more enjoyable cycling journey where all transport modes are balanced.

Traffic calming devices and 40km/h areas throughout the City of Unley aim to divert unnecessary traffic from local streets to arterial/main roads, and facilitate slow speeds, however, traffic data collection reveals that vehicles are continuing to speed in some streets and more work is required to reduce the speed differential between bikes and cars.

6.1. Vehicle Counts and Speeds

The City of Unley regularly collects traffic data city-wide which greatly assists the analysis of cycle route selection. Figure 13 illustrates the most recent traffic data collected on streets that form the cycling network.

Austroads Guidelines recommend that cyclists be separated from traffic when a street carries 3,000 vehicles per day with a speed of 50km/h; or 5,000 vehicles per day with a speed of 40km/hr. Cyclists and motorists can share the roadway when traffic volumes and speeds do not fall into those categories. Most residential streets in the City of Unley are signed at 40km/h with the exception of designated collector routes. Regardless of the signed speed limit, the streets that are of interest carry traffic volumes greater than 3,000 vehicles per day and/or traffic speeds higher than 40km/h because these are tipping points where the separation of cyclists should be considered, refer to Table 2.The above analysis is transferred to Figure 14, which illustrates which roads require cyclist separation or traffic calming to meet the guidelines. The need for traffic calming has been prioritised according the extent of speeding, with the highest speed roads requiring works in the short-term.

Table 2: Mixed traffic or separate cyclists.

	Traffic volume (vehicles per day)			85th percentile Traffic Speed (km/h)		
Cyclist facility	<3000	3000-5000	>5000	<40	40-50	>50
Mixed traffic	✓			✓		
Consider separation		✓			✓	
Separation			✓			✓

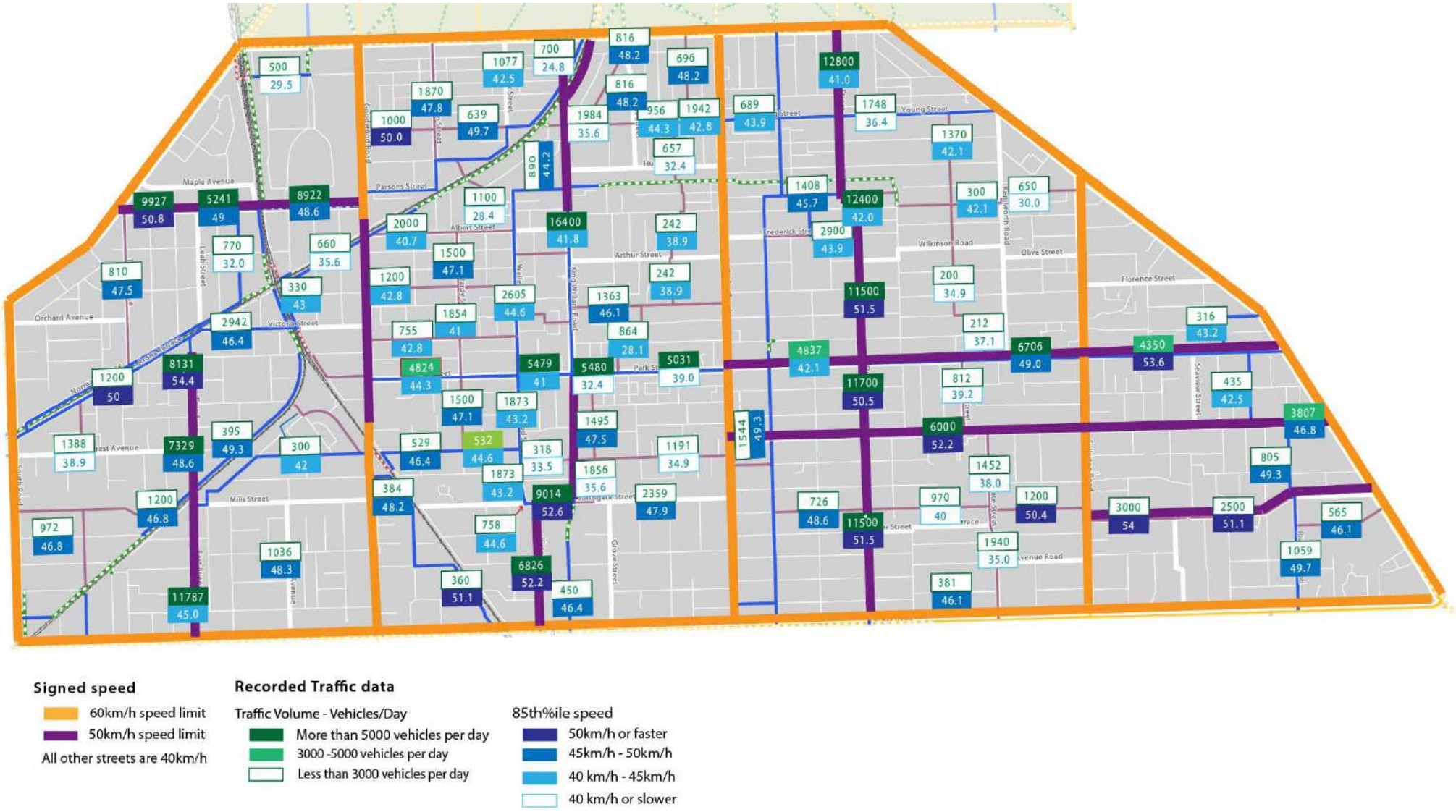


Figure 12: City of Unley traffic volume and speeds.

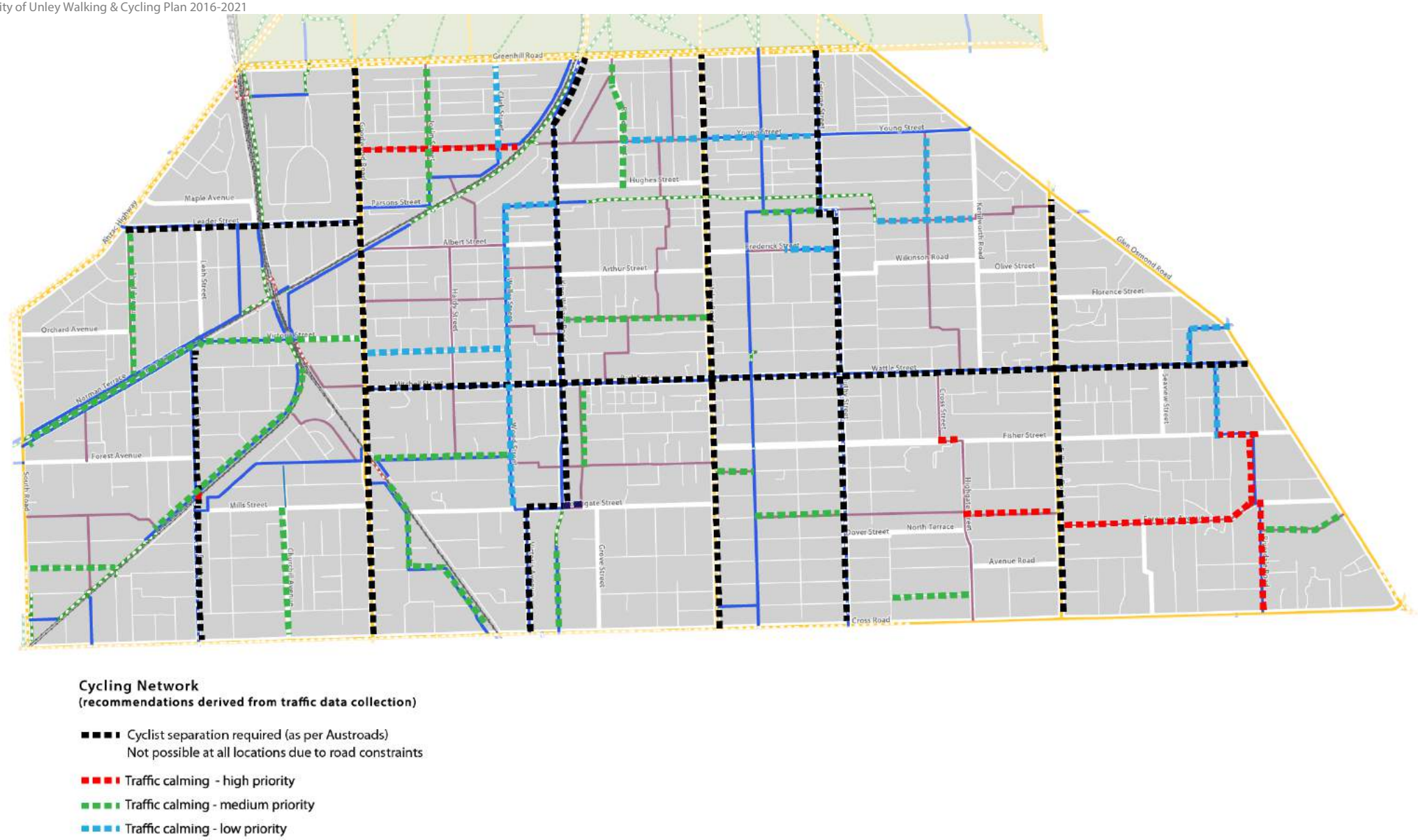


Figure 13: Recommendations derived from the traffic speed and volume data.

6.2. Cyclist Collision Data

To help identify specific hazardous locations, cyclist collision data for the last 5 years (from DPTI) has been analysed. The cyclist collision map is included in the Appendices, and locations where clusters of cyclist collisions were reported are discussed below.

- **Cambridge Street roundabouts**. 10 cyclist collisions were recorded at the roundabout of Cambridge Street and **Fisher Street** and 5 at the Cambridge Street and **Wattle Street** roundabout. All collisions were right-angle with the driver failing to give way. The roundabouts are 'tangential' design which directs cyclists to the edge of the lane while motor vehicles remain in the centre of the lane. Recent research suggests that 'radial' design is preferred as it directs cyclists to the centre of the lane where they 'claim their space' in front of motorists, and are hence more visible to motorists. If these roundabouts are modified to a radial design, it is likely that there would be safety improvements.(It is noted that Cambridge Street and Fisher Street is not on the cycling network, but given the crash clusters it's safety improvements should be addressed).
- **Wattle Street**. 13 collisions have occurred on Wattle Street. Excluding the 5 collisions at the roundabout (described above), all were either side-swipe or right angle crashes. Mid-block, cyclists ride between parked cars and moving traffic; and at signalised intersections, additional turn lanes are provided which force cyclists to claim their space in the centre of the lane, which may be intimidating with the significant volumes (4-6,000vpd) and speeds (43-54 km/h).

Other significant crash clusters are on arterial roads as follows:

- **Anzac Highway.** There were 36 cyclist collisions recorded along Anzac Highway, 19 of which were side-swipes.
- **Anzac Highway at Maple Avenue**. Of the 11 collisions at the junction of Maple Avenue, 8 were side-swipes and 3 were right turn collisions. The bicycle lanes along Anzac Highway are narrow (approximately 1.1 metres), and adjacent to narrow traffic lanes which have been squeezed to fit the bike lanes. DPTI installed green coloured pavement in the bicycle lane across the Maple Street junction in January 2014, which should assist with motorist awareness of the lane edge. Two cyclist collisions occurred since that installation, which indicates that further consideration is required. The footpaths are wide enough for the kerb to be relocated to enable wider lanes. This would be a high cost project, but should be considered, in particular when kerb replacement is due.
- **Unley Road**. There were 49 cyclist collisions recorded along Unley Road, one of these being a fatality. Of these, the type of crashes that occurred more than once were; 5 x car doors opening onto cyclists, 18 x vehicles turning into a side street without seeing oncoming cyclists and 19 x side-swipes. Cluster locations were at the T- junctions of Unley Road with Hughes Street (4 x), and Frederick Street (3 x). The current upgrade

of the Rugby/Porter Bikeway may attract some riders to change their route from Unley Road to the new bikeway, however this route is less direct than Unley Road and not appropriate for confident, commuter cyclists who prefer the fastest route. Unley Road is a clearway during the peaks but cars are allowed to park on the road (the space used by cyclists) between peaks which causes squeeze points.

- **King William Road**. There was a total of 34 cyclist collisions recorded along King William Road. Of these, the common crash types were side-swipes (12 x), opening door (x 6), right angle/right turn (10). King William Road carries high traffic volumes and does not have bicycle lanes installed. Cyclists ride between moving traffic and parked cars (with high parking turnover). The concrete pavers facilitate slower traffic speeds which improve cyclist amenity but are uncomfortable to ride on.
- **Greenhill Road, at cyclist crossing locations**. DPTI have recently installed median refuges at these locations, green coloured bicycle lanes across the junctions and bicycle lanes on the major approach roads. These works are expected to result in significant safety improvements.
- **Anzac Highway / Greenhill Road intersection**. DPTI have recently constructed a shared path underpass at this location for north-south cyclists and an at-grade crosswalk for east-west movements. These upgrades are significant safety improvements.

7. Cycling Network 2015-2020

The updated cycling network is illustrated in Figure 15, and coloured-coded to identify the five route categories (Low-Traffic Bikeways, Cycle Corridors, Greenways, Main Roads and local links.

Critical considerations in selecting and updating the route network were:

- To fill in the missing links;
- To mitigate safety risks at hazardous locations;
- To link to existing road crossings;
- To connect to land-uses that are cyclist generators (e.g. schools, shops, places of employment, villages, city routes, greenways, Showgrounds, Adelaide CBD etc.);
- Suitability of traffic speed and volume; and
- To identify future routes.

Key new routes that have been added to the existing network include:

- Simpson Parade shared path – between King William Road and Mike Turtur Bikeway;
- Shared Path along Greenhill Road (northern footpath) – partner with Adelaide City Council and DPTI;
- Glen Osmond Greenway; and
- Several low-traffic Bikeways (north-south and east-west).

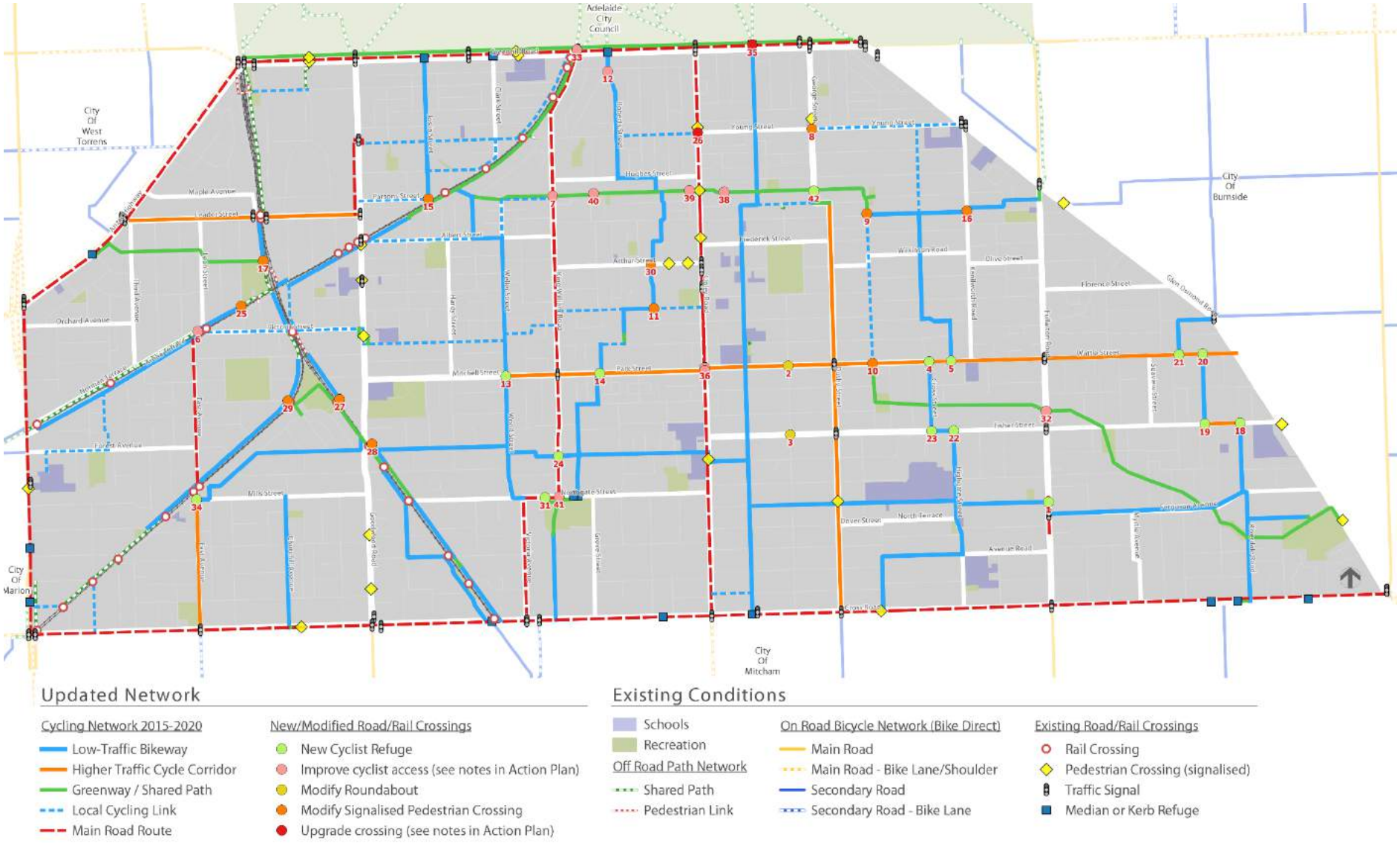


Figure 14: City of Unley cycling network 2015-2020.

7.1. Updated Cycling Infrastructure

The type of infrastructure works required to complete the network are illustrated on Figure 25. Route sections are numbered which reference to the details, priorities and costings provided in the Action Plan. Extensive saddle surveys and route inspections were undertaken to identify specific issues on key routes and a detailed separate site survey report has been prepared. The report includes a Google Maps web-link that identifies each specific issue along every route and geo-referenced photographs. The Action Plan herein, refer Section 12 lists all infrastructure deficiencies identified during the surveys, as well throughout the entire cycling network. The type of recommendations and actions are as follows.

7.1.1. Enhanced Bicycle Lanes

Enhanced bike lanes offer stronger separation between cyclists, moving vehicles and/or parked cars, and/or provide higher visibility. They strengthen standard lane types such as Exclusive or Bicycle Car Parking Lanes and are achieved through various measures, such as chevron line marking, green-coloured lane marking or tactile marking.

Duthy Street / Leader Street / East Avenue

Simple reallocation of lane widths can achieve better separation and is recommended on Duthy Street, East Avenue and Leader Street as shown in Figure 16. This concept design reallocates lane space to provide buffer zones between cyclists and car doors, and cyclists and moving traffic. The traffic lanes are reduced to 3.0m wide which provides sufficient width for buses when taking into account the speed limit of 50km/h and the buffer zone.

Wattle Street / Park Street

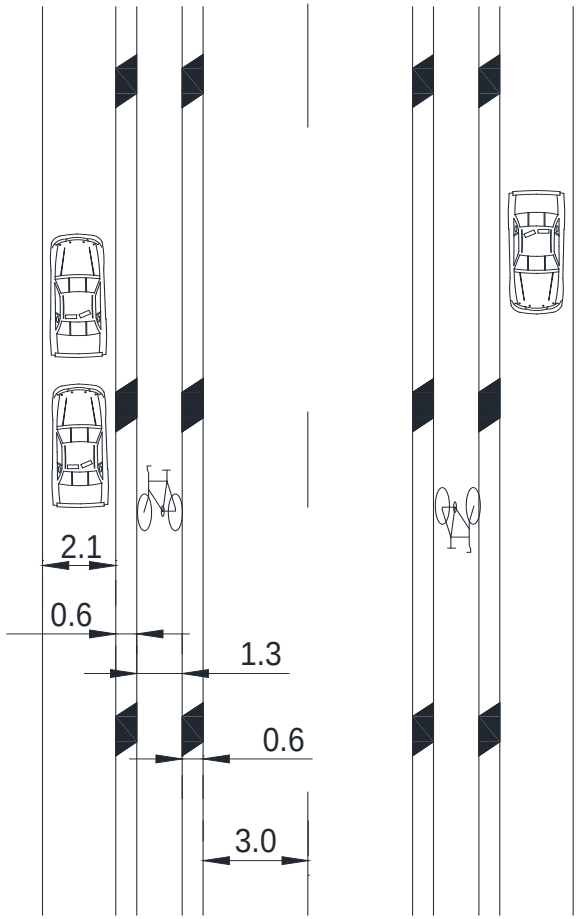
The roadway in Wattle Street and Park Street is currently not wide enough to fit bicycle lanes and car parking on both sides of the road. The traffic volume (up to 7,000) and speeds (up to 54km/h), mean that separation of cyclists from traffic is required. Currently, cyclists are squeezed between car door opening and moving traffic.

In the long term, when the road is due for reconstruction and the trees are near the end of their life, an entire new street-scaping design is recommended. Until that time, an interim concept is shown on Figure 17 that uses staggered parking (parking on one side of the road at a time) to gain space for bike lanes. In addition, the staggering also creates a meandering road alignment that would facilitate slower speeds. Observations indicate that there is not a high demand for car parking in these streets and every house has a driveway.

As car parking and some trees would require removal, the detailed design would be subject to a car park utilisation and tree health survey, with the aim to positioning the staggers to suit these outputs.

Green Coloured Bike Lanes

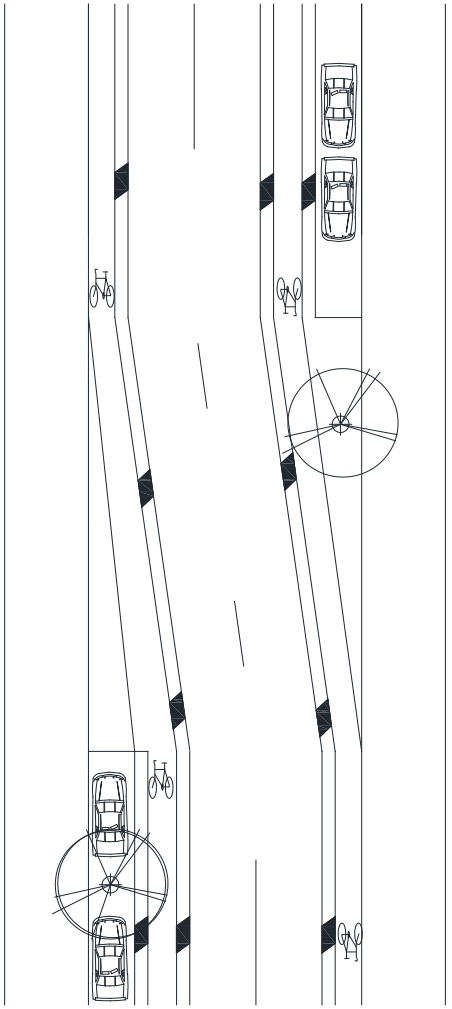
The City of Unley has already started to roll-out green-coloured bicycle lanes in areas of potentially high conflict between cyclists and motorists, such as road junctions along East Avenue, and this treatment is recommended at locations where bicycle lanes exist or new bicycle lanes are recommended.



Feasibility depends on:

1. Detail design to ensure sufficient width.
2. Liaison with Public Transport Division on bus routes.

Figure 15: Cycle Corridor typical cross section.



Feasibility depends on removal of on-street car parks.

Figure 16: Possible Wattle St / Park St Concept.

7.1.2. Bikeways - Traffic Calming

For bicyclists and vehicles to comfortably share the road space (mixed traffic), vehicle speeds should be 40km/h or less. Although local streets in Unley are signed at 40km/h, traffic data shows that many vehicles are travelling faster, refer to Figure 13. Therefore, on the cycling network, strategies are needed to reduce speeds to 40km/h or less; by either an uptake of speed detection and issuing of fines, or the installation of traffic calming devices. Recommendations for traffic calming on Local Street cycling routes are as follows:

- 85th percentile speeds above 50km/h – high priority
- 85th percentile speeds 45-50km/h – medium priority
- 85th percentile speeds 40-45km/h – low priority

The Collector roads are signed at 50km/h and therefore traffic calming has been recommended where traffic speeds were recorded higher than 50km/h (e.g. Wattle Street between Fullarton Road and Glen Osmond Road). It is recommended to review the signed speed of these roads, and in particular to consider **reducing the speed limit on Ferguson Avenue and Fisher Street to 40km/h**.

7.1.3. Safer Road Crossings

Where a route on the cycling network crosses a road with more than 3000 vehicles per day, safe crossing infrastructure is recommended. This can be in the form of a median or kerbside refuge, signalised intersection or pedestrian actuated crossing. Figure 18 illustrates a typical concept of central median refuges where a Low-Traffic Bikeway crosses a busy road such as Fisher Street, Wattle Street and Northgate Street.

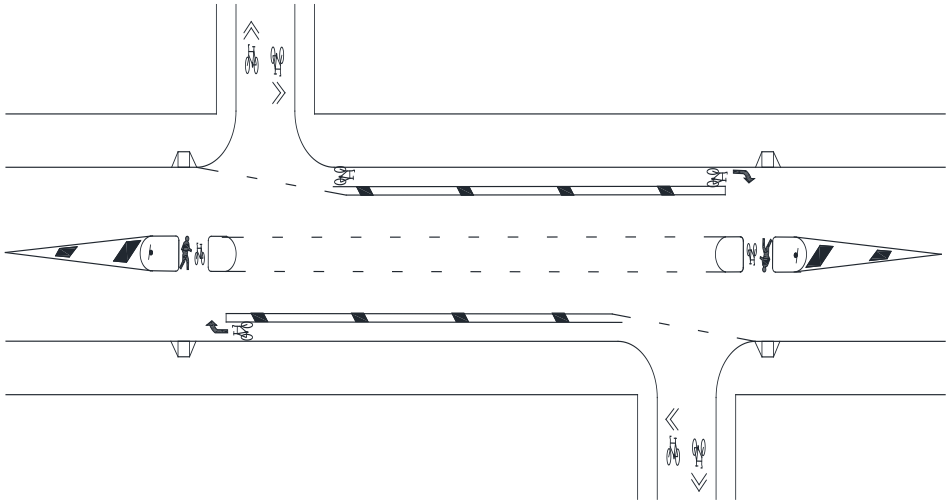


Figure 17: Typical median refuge crossing for staggered routes across busy roads (typical example only – detail design required).

Cycling routes have been planned to line up with existing signalised crossings of arterial roads. In some locations, a Pedestrian Actuated Crossings (PAC) is located to one side of the route. It is recommended that in these locations, the footpath between the side-street cycle route and the PAC be marked with shared path pavement logos to guide cyclists to the safe crossing point, and alert pedestrians that cyclists are encouraged to be on the footpath in that locations. Examples of these locations are on Goodwood Road between Young Street and the PAC (east side of Goodwood Road) and then from the PAC to Leader Street (west side); Cross Road between cycling routes and median refuges, Maple Avenue and the median refuge on Anzac Highway; Barr Smith Avenue and the

PAC on Glen Osmond Road and to link the PAC on Goodwood Road to Angus Street & Victoria Avenue either side.

Where there is no safe crossing facility to link with, a new crossing is recommended. For instance, to connect the Glen Osmond Creek Path to the Mike Turtur Greenway, a crossing is required at King William Road. This could be in the form of a median refuge, wombat crossing or Pedestrian Actuated Crossing and assessment is required to determine the best solution.

The roundabouts along Cambridge Street have recorded significant collision rates, and it is now accepted that roundabouts are safer for cyclists if they are designed as 'radial' instead of 'tangential'. Therefore a recommendation has been made to modify these roundabouts.

7.1.4. Access through Traffic Control Devices

Cyclist access is provided at most traffic control devices throughout the City of Unley with the exception of:

- Several road closures / half road closures without cyclist access (for example; access to Glen Osmond Creek shared path at Windsor St/Hill St)
- Traffic control devices that create a squeeze point for cyclists (for example; slow points in Wood Street, Millswood).

A number of locations are identified in the Action Plan for upgrade, but a city-wide assessment of all traffic control devices along every cycling route has also been recommended.

7.1.5. Smooth Road Surface

A smooth riding surface is important for cyclist comfort and also safety. Road and path upgrade and maintenance programmes need to prioritise the cycling network. Although there is an extensive off-road network, the surface in some areas is uneven due to tree roots, water damage and age of pavers. The poor level of rider comfort on a path can significantly discourage users. Surface construction works include; road or path reconstruction, repairing pot-holes, filling of longitudinal cracking, edge deterioration and chamfering build up of bitumen at concrete gutter interface. Maintenance works include removal of plant debris and glass from the riding area. Particular attention should be given to times of the year when trees drop berries, leaves etc.

7.1.6. Sharrows

Shared Lane Marking (Sharrows) are recommended on key routes. Sharrows are a new form of treatment, and were approved for use in South Australia in 2015. They assist cyclists with lateral positioning and wayfinding, and alert motorists that they are on a designated cyclist route. Sharrows have been recommended on routes where traffic volumes are less than 3,000 vehicles per day and traffic speeds are 50km/h or less. Where 85th percentile speeds were recorded higher than 50km/h, traffic calming has been recommended so that the installation will comply with the DPTI requirements.

7.1.7. Cycling on Footpaths

Traditionally, the road has been for motorised vehicles and the footpaths for pedestrians, often leaving no space for people to ride a bike. Recent changes to the Road Rules in South Australia (October 2015), have made it lawful for people of all ages to ride on footpaths, unless a sign prohibits cyclists from doing so.

This law change is of particular benefit at locations where a bicycle lane or path suddenly terminates or there is a squeeze point in the roadway, allowing cyclists to avoid a potential hazard. It is anticipated that this rule will encourage more people to cycle for short trips (to shops, school etc), who feel intimidated by traffic. Fast and confident cyclists are less likely to use the footpath, except in particularly hazardous situations.

There is concern in the community that there will be conflict between cyclists and pedestrians, and particularly the elderly, hearing impaired and/or fragile pedestrians feel intimidated by a cyclist approaching from behind.

Pedestrians and cyclists move differently as pedestrians meander, and cyclists move in a direct line. In countries where cyclists regularly ride on footpaths, pedestrians are more aware of the potential approach of a cyclist and look behind before changing their path, and cyclists are considerate. Footpath etiquette is required by all footpath users, such as: Cyclist etiquette: ride at walking pace, ring a bell as an approach warning, and give way to pedestrians. Pedestrian etiquette: be aware that cyclists may approach and pass, keep on a relatively straight path, look behind before changing direction, be aware that listening to music reduces hearing of an approaching bell.

Cycling on footpaths is not appropriate where a footpath is narrow (less than 1.5m), has high pedestrian activity, and/or there is lack of space due to outdoor dining and/or street furniture. However, it is not appropriate to install 'Bicycle Prohibited' signs throughout the city, due to the signage clutter and visual amenity.

Cycling on footpaths should not be seen as an alternative to providing cyclist infrastructure as footpath cycling is generally inconvenient, can create conflict with pedestrians and may place cyclists out of clear sight-lines from motorists. Therefore, the law change has not impacted on the development of the cycling network herein. However, more attention has been given to footpath construction so that widths are maximised where possible, particularly around Schools.

Where it is not possible to provide continuous high-quality cyclist infrastructure, signage or pavement stickers can be installed to remind users of pedestrian priority and encourage rider/walking consideration (refer Figure 19). Alternatively, formerly converting a short section of footpath to a shared path helps to alert pedestrians that cyclists may be present.

Although the law means that cyclists are permitted to ride on footpaths without a bicycle logo, it is recommended to install shared path logos at key locations, where a footpath connection fills a hazardous gap in the road network.

Figure 18: Example of footpath sticker in area of cyclist/pedestrian conflict. (City of Melbourne)

7.1.8. Shared Paths/Greenways

New shared paths are recommended to fill in some critical missing links such as a shared path alongside the culvert in Simpson Parade (route assessment recently prepared by GTA Consultants), and some long-term major projects such as along Glen Osmond Creek (Ridge Park Reserve to Windsor St), a Greenway along the Belair Rail Line, and a shared path along Greenhill Road (north side – between Park Lands and Kerb). In addition, upgrades to existing shared paths include resurfacing of Mike Turtur Greenway (northeast of Goodwood Rd), upgrading of lighting where required, and reallocating priority to the shared path alongside Charles Street and Culvert Street (at garage crossovers) and minor side-streets so that vehicles give way to cyclists and pedestrians, rather than the existing scenario where shared path users must give-way at every crossover and junction (see typical example Figure 20).

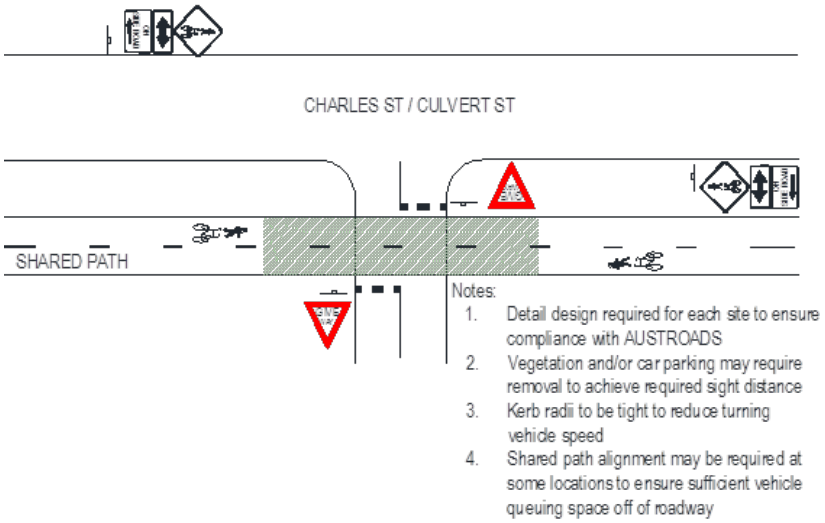


Figure 19: Changed priority - vehicles give way to shared path (typical example only).

7.1.9. Wayfinding Signage, Bicycle Logos, Bike-Aware signage and Maps

The Low-Traffic Bikeways are not as direct as collector or main roads and wayfinding signage at every turn is critical for the success of these routes. The route name, destination and length in kilometres and/or minutes to major destinations assists cyclists in choosing the route. It is recommended that a new and consistent signage strategy be developed to suit Councils urban design criteria with lettering size to meet Australian Standards (in addition to DPTI's Greenway signage). An updated cycling route map of the City of Unley is also required, and a distribution strategy prepared (e.g. letter boxes, cafes, convenience stores, libraries, sports clubs).

Wayfinding signage along commuter corridors (main roads with bicycle lanes) are not as critical as the direction of travel is more obvious. However, main road areas with high car parking demand are good locations for "bike aware" signage, such as Figure 22. By raising motorist awareness, this sign can help reduce injuries to cyclists from opening doors.

The map in Figure 12 can be used as a guide for the signage of low traffic bikeways within and through the City of Unley.

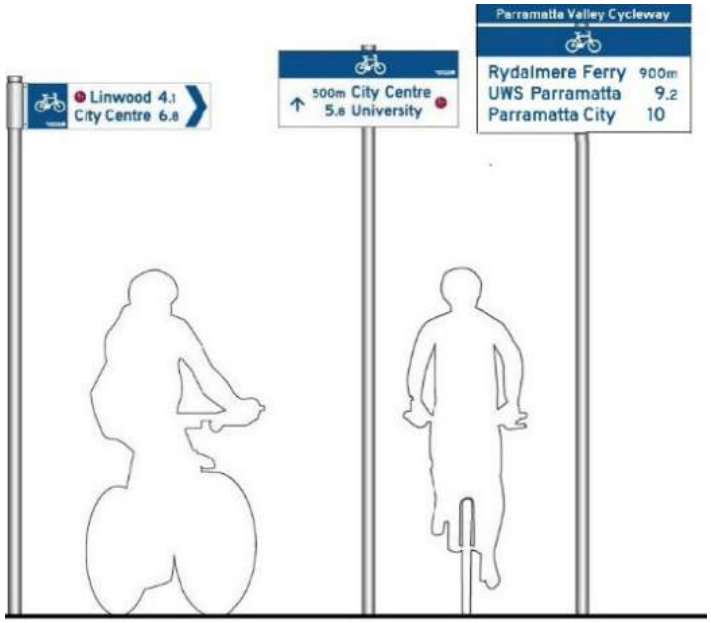


Figure 20: Bicycle Wayfinding Signage (Austroads).

Figure 21: Sign to help prevent car-dooring where high parking demand is next to a bike lane (Sign by Adelaide City Council)

7.1.10. Arterial Roads

Recommendations along arterial roads require partnering with DPTI, and include the following:

- Extend clearway times to increase the effectiveness of part-time bicycle lanes.
- Reduce traffic speed limit to 40km/h through hubs (e.g. Unley Central, Goodwood Central (rail line to Victoria St), and Fullarton Road shops.
- Construct continuous footpaths across junctions through hubs (refer Figure 23.
- Improve cycling on Unley Road as part of corridor upgrade. Unley Central and Goodwood Road Central to be improved with reduced lane widths and median islands to improve cyclists and pedestrian amenity.
- Install shared path signage on footpaths between side street cycle routes and closest signalised pedestrian crossing or median refuge (refer Section 7.1.3).
- Liaise with DPTI to reduce waiting times for pedestrians at traffic signals. In particular Young Street and Glen Osmond Road.

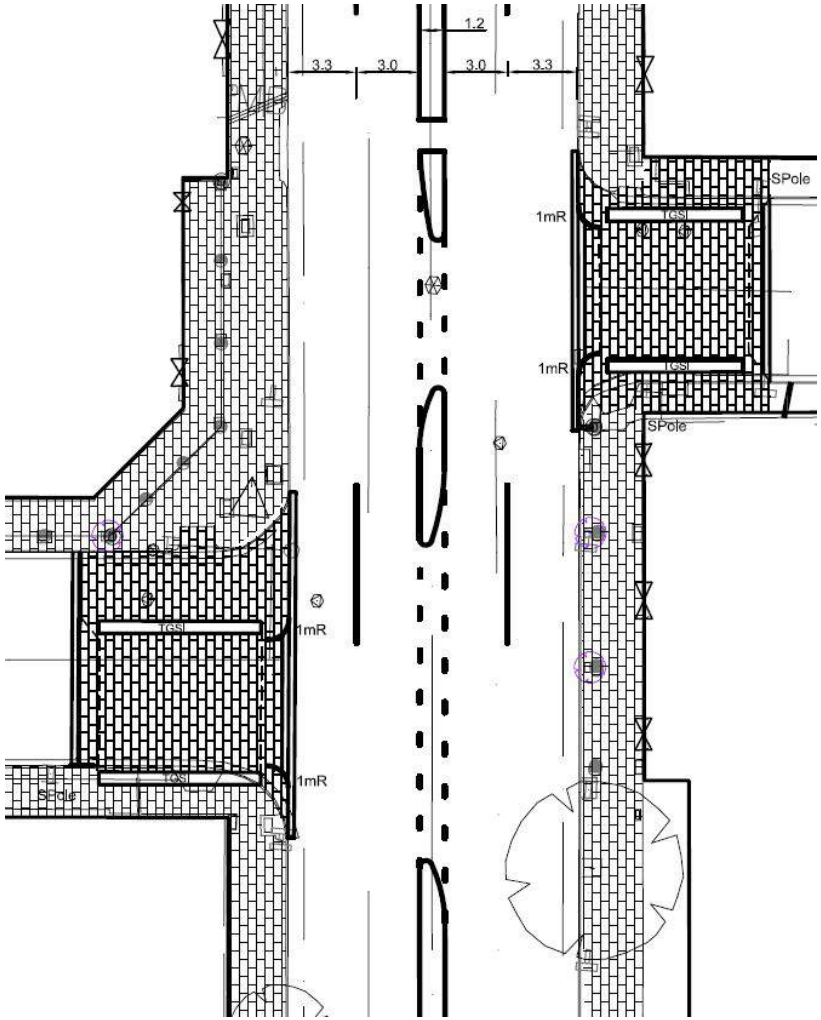


Figure 22: Goodwood Road concept (with possible future median islands).

7.1.11. Shared Path Etiquette Signage

Some shared paths within the City of Unley are narrow due to site constraints and in busy periods there can be conflict between pedestrians and cyclists. As walking and cycling increases it is important to remind users to be considerate of each other. Signage and pavement stickers are recommended in narrow path sections or where conflict has been recorded. Messages can include (but not be limited to) those in Figure 24 below:

- Keep left.
- Give way to pedestrians.
- Ring your bell early.
- Control your pets.
- Be polite and aware of others.

Figure 23: Shared path signage and etiquette (courtesy of Sydney Cycleways).

7.1.12. Lighting

For cycling to be considered a legitimate transport option, particularly as an alternative to the car for short journeys, it must be promoted as an around-the-clock opportunity, rather than just a daylight activity. It must be realised that cycle journeys will be made after dark, particularly during the winter months when daylight hours are reduced.

7.1.13. Quick Wins

There are numerous cost effective and simple solutions that make a big difference for cyclists. These include improved road crossings (median refuges), route wayfinding signage and logos/Sharrows, Bike Aware signage (see Figure 22), footpath links (short sections of shared paths to link to safe crossing points), high rotation maintenance schedule of cleaning leaf debris on the cycling network and promoting shared path etiquette.

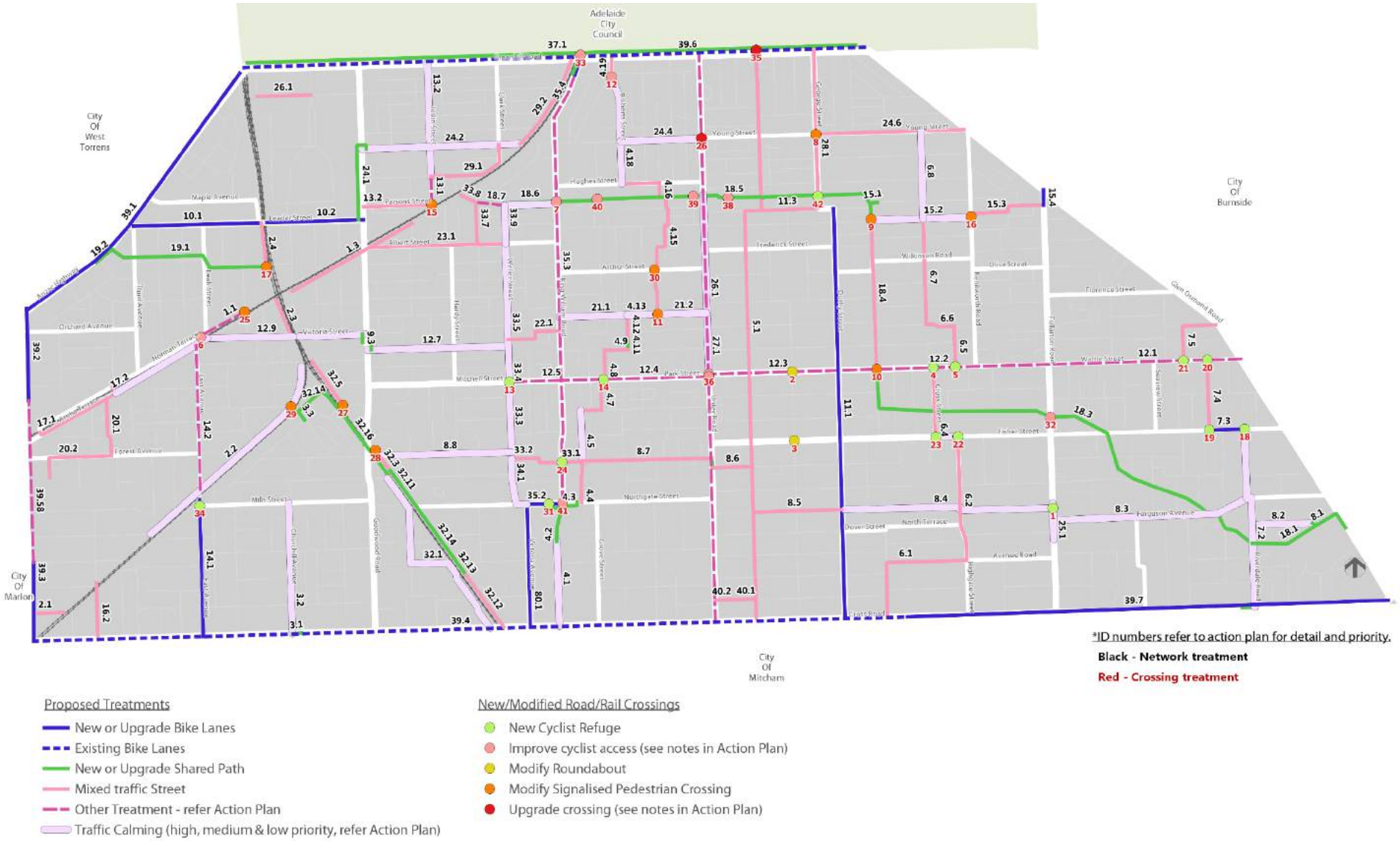


Figure 24: Proposed treatments by route and segment number. See Action Plan for detail.

7.2. Actions and Priorities

A detailed Action Plan will be completed after consultation. Several key recommendations are illustrated Figure 26 for the purpose of this Draft Plan.

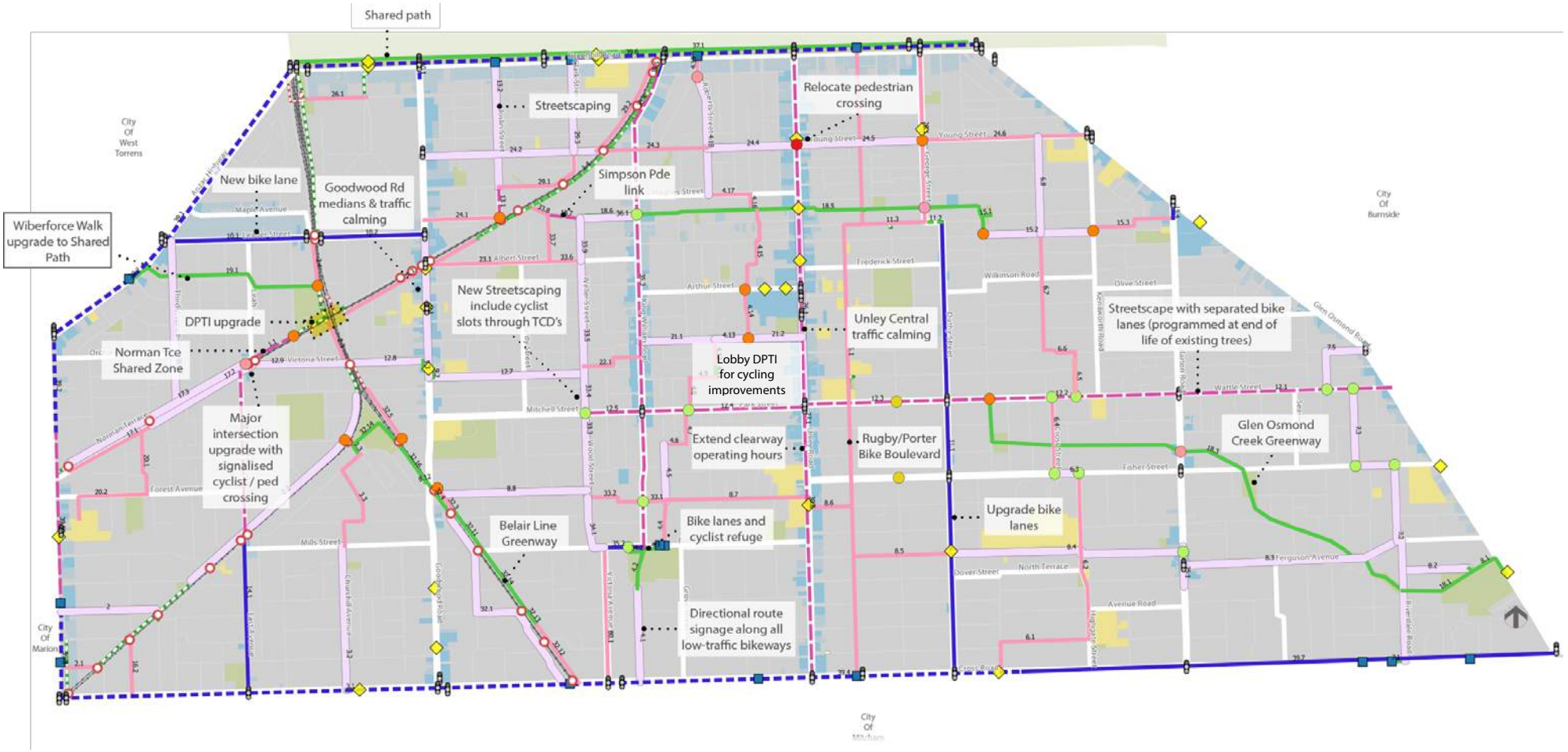


Figure 25: Key recommendations for the City of Unley Cycling Network 2015-2020.

‘Pedestrian activity is a most basic and fundamental human activity. It promotes health and wellbeing, and social interaction. It increases vibrancy for places and communities, and is an environmentally friendly way to travel.’

-Institute of Public Works, Engineering Australia

8. Updating the Walking Network

Now more than ever streets play an integral role in sustainable urban life, supporting our social needs and reflecting cultural shifts. Historically, streets have focussed on motor vehicle movement and access with no or little further consideration. As society evolves, our living patterns and societal demands change along with the way we think. Streets are fast becoming multi-purpose, multi-use spaces that serve as part of the open space network and destinations in their own right. They have become places for people to experience, providing multi-modal network connectivity and encourage communities to connect with each other and their surrounds.

In many instances walking and cycling networks can overlap to utilise crossing points, rest areas and established routes; access transport and places of interest; and improve vibrancy. However, this plan acknowledges the distinct differences between them and what planning for each should achieve. Streets play host to a range of activities in addition to simply travelling on foot. Different street environments support these activities in various capacities while reflecting nearby land uses and demographics with street design responding accordingly.

Building upon the 2005 network, the revised network seeks to retain established routes and build upon them. The walking network has been reviewed to assess problematic locations, crossing points of road and rail infrastructure and links between Unley's unique village zones to minimise land-locking and improve city-wide permeability. The outcome is a cohesive plan offering improved social spaces, a pleasant walking environment, safer streets and quality neighbourhoods, all of which encourage active living.

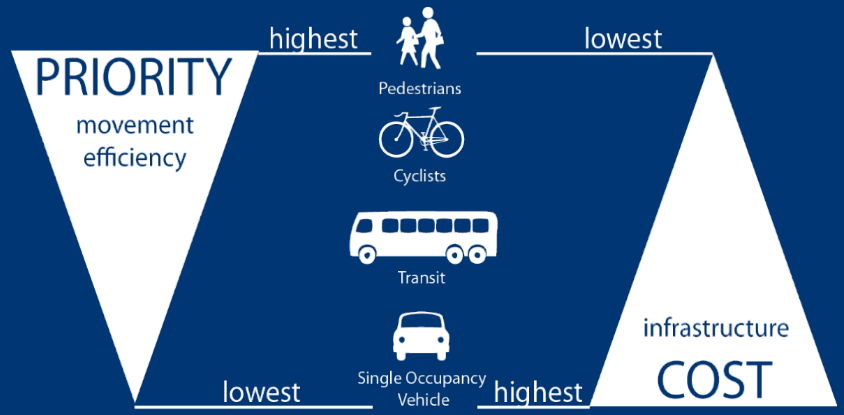
 Pedestrian use	• Commuting. • Walking or running for exercise and recreation. • Accessing adjacent land uses.
 Pedestrian activity	• Waiting for public transport. • Alfresco/footpath dining. • Socialising. • Exercise. • Resting/relaxing. • Shopping/trading (i.e. markets). • Playing and busking/entertaining.
 Supportive infrastructure	• Public transport stops. • Legible paths, ramps, steps and kerb ramps. • Safe crossing points (signalised, refuge etc.) • Lighting. • Seating. • Shade/shelter. • Accommodating path widths. • Public artwork. • Gathering spaces. • Play spaces. • Drinking fountains.

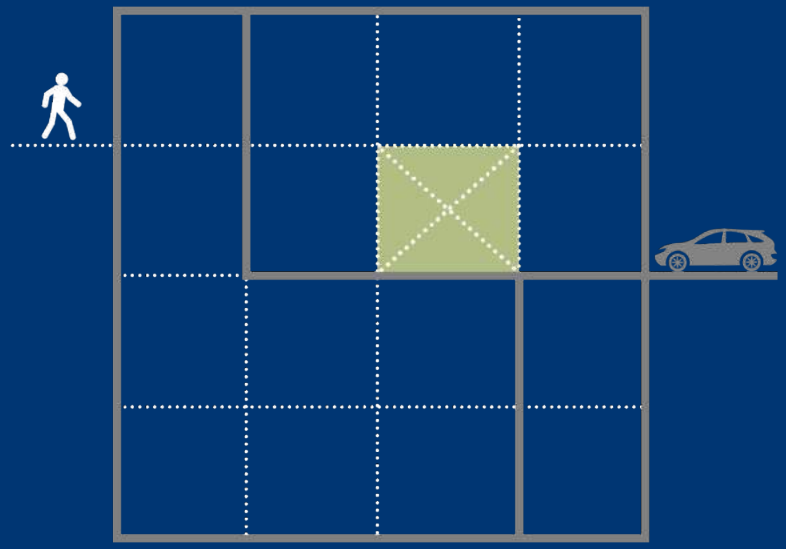
8.1. Planning for Pedestrians

The City of Unley walking network needs to effectively integrate safe and enjoyable walking facilities along and across roads and trails to form a continuous network in line with the 'Streets for People' framework (Heart Foundation South Australia 2012). The network should seek to prioritise pedestrian movement where appropriate and be universally designed, enabling pedestrians of all abilities to easily and safely navigate the built environment by foot, bike, wheelchair, pushing a pram or wheeling luggage. Characteristics of a prioritised pedestrian environment include:

- Reduced traffic speeds.
- Well-connected networks with continuous footpaths and road crossings.
- Well distributed access to public transport (Figure 27, next page).
- Places for social interaction - to meet, stay and sit.
- Signage/way-finding.
- Well-maintained, unobstructed paths without overhanging foliage.
- Shade and shelter where appropriate, i.e. awnings and trees.
- Paths, ramps, steps and kerb ramps that meet Australian Standards.
- Path widths that accommodate anticipated pedestrian volumes.
- Road crossings located at practical locations and at frequent intervals guided by proximity of destinations.
- Traffic signals or pedestrian refuges on busy, wide roads where possible.
- Waiting times of 60 seconds or less at all signalised crossings with high pedestrian volumes, and 90 seconds maximum at other locations.
- Adequate lighting.

Pedestrians can be a priority on some streets





Pedestrian permeability and vehicle movement

8.2. Footpath Provision and Design

Footpaths and road crossings provide the basic means to walk from one destination to another. They should be continuous, well-maintained, unobstructed and clear of overhanging foliage. The width of the footpath needs to accommodate the anticipated pedestrian volume and reflect adjacent land uses. The tables on this page provide guidance on clear desirable widths based on Austroads Guidelines. It is important that additional space is provided for other features such as lighting, signs, seating, bicycle parking, outdoor dining and planting. The 2015-2020 network is underpinned by these guidelines.

Table 3: Footpath provision by road type and land use (source: Guide to Austroads part 6a).

	Footpath provision			
	New Roads		Existing Roads	
Road type/Land use	**Preferred**	**Minimum**	**Preferred**	**Minimum**
Activity Centre	Both sides		Both sides	
Bus Route	Both sides		Both sides	
School	Both sides		Both sides	
Arterial Road (residential)	Both sides		Both sides	
Collector/ Distributor (residential)	Both sides		Both sides	
Local Road (residential)	Both sides		Both sides	One side
Laneway	Shared Space / slow speed (10km/h)		Shared Space / slow speed (10km/h)	

Table 4: Desired footpath widths by situation (source: Guide to Austroads part 6a).

Situation	Desired width	Comments
High pedestrian demand	2.4m (or higher based on demand)	Generally commercial and shopping areas.
Average pedestrian demand	1.5m (1.2m minimum)	General minimum is 1.2m for most streets. 1.0m absolute minimum at a squeeze point. Clear width required for one wheelchair.
Low pedestrian demand	1.2m (1.0m absolute min)	Clear width required for one wheelchair.
Shared Path	2.5m to 4m	Refer design toolkit.
For wheelchairs to pass	1.5m to 1.8m (desired minimum)	Allow for two wheelchairs to pass (1.5m minimum, 1.8m comfortable). Narrower width (1.2m) can be tolerated for short distances.
For people with other disabilities	1.8m to 2.0m	Provisions for differing abilities can, at times, cause conflict.

Using widely accepted measures of walkability[1], it can be seen that the City's west is well-served by bus, tram and train, while the central and eastern areas are serviced only by bus. Bus routes predominantly run north-south through the City, which are shown to have higher pedestrian demand with further requirements.

Two pockets of reduced transit access are visible in the east and as shown in Figure 5, have comparatively lower rates of walking to work.

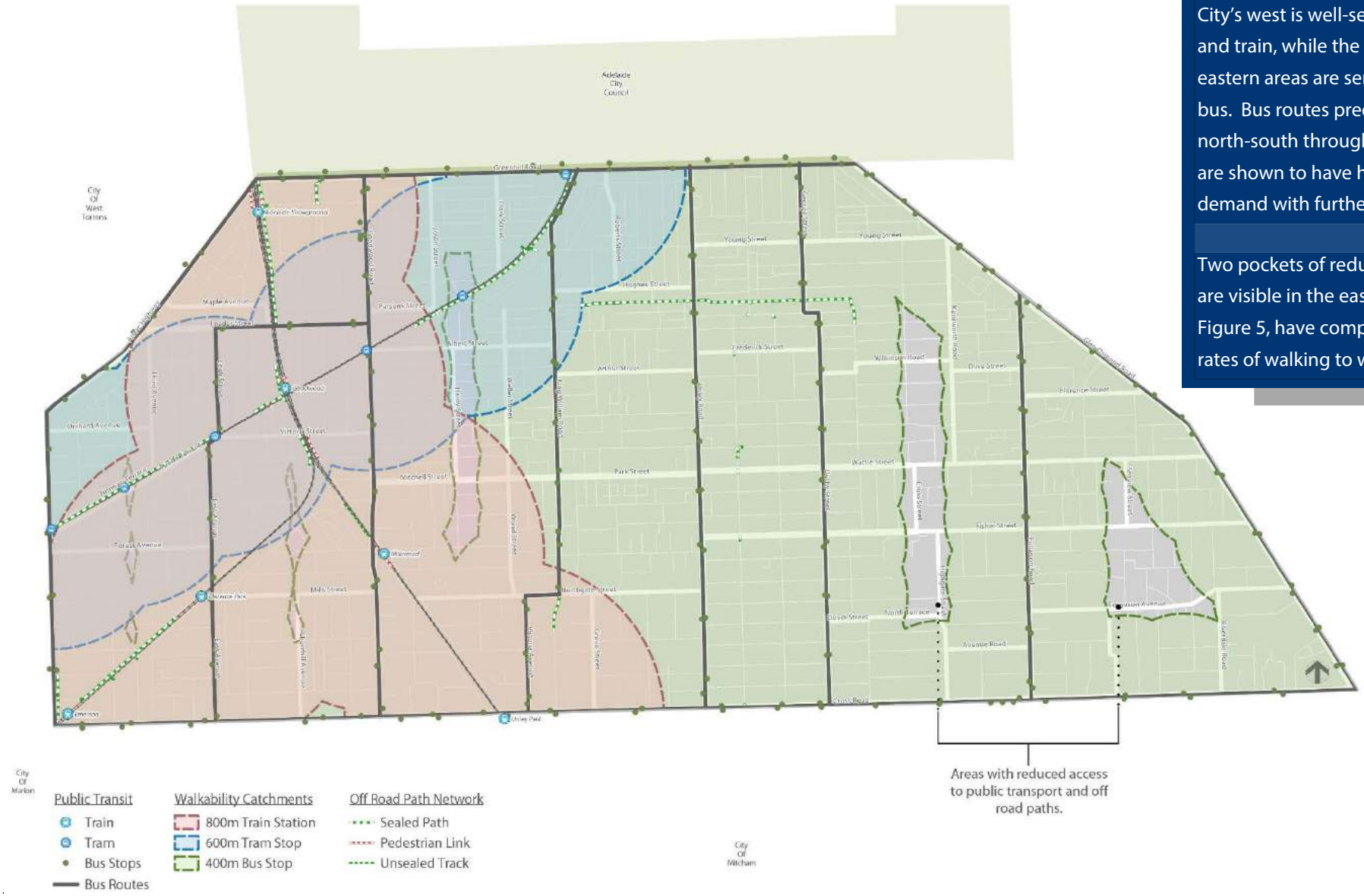


Figure 26: Access to public transport by walkability catchment.

[1] See for example: *http://sydney.edu.au/business/__data/assets/pdf_file/0013/106501/Daniels-Mulley-Explaining.pdf*

9. Pedestrian Safety

9.1. Traffic Speed

Traffic speed is a significant factor that affects the perception of how pedestrian-friendly a street is. Pedestrians are among the most vulnerable of road users, while motor vehicles have airbags, crumple zones and seatbelts for protection. Reduced speed limits lower the overall likelihood of an accident occurring as motorists are more likely to see and be able to stop in time to avoid conflict. The likelihood of surviving a collision is increased, whilst the severity of consequential injuries is decreased.

Lower speeds also mean less need for expensive traffic controls, road safety barriers, mode separation as well as expensive and disruptive traffic management for temporary works. Also, when speeds are lowered, more roadside furniture and trees can be installed enhancing the pedestrian environment. The City of Unley has been at the national forefront of reducing traffic speeds in local streets and served as an example to many local governments.

9.2. Collision Data

The map in Figure 28 shows the pedestrian collision locations (2009-2013), while highlighting areas of increased pedestrian activity and how they are intrinsically linked given the higher probability of a collision occurring. Notable collision clusters occur on arterial roads and areas with significant pedestrian activity; including Cross Road and Goodwood Road intersection, Greenhill Road and George Street intersection, Goodwood Road activity area, Unley Road activity area (particularly near the Unley Shopping Centre), King William Road activity area, Fullarton Road and Fisher Street intersection, Leader Street and Anzac Highway intersection and Glen Osmond Road (Arkaba signalised crossing).

9.3. High Pedestrian Activity Areas

The main pedestrian activity zones are made up of activity centres and main streets, which together reflect Unley's villages and are illustrated in Figure 28. These are calculated by extrapolating high density areas of retail uses that promote foot traffic, which are located along Goodwood, King William, Unley, Fullarton and Glen Osmond Roads, and to a lesser extent Duthy Street. Greenhill Road's office/commercial nature facilitates lower levels of pedestrian traffic.

The City of Unley hosts to a number of large-scale events at various locations throughout the year, which can impact the transport network and travel patterns. For example, road closures may eliminate immediate traffic barriers around an event space, while putting pressure on the surrounding network creating new barriers elsewhere. Special event locations in Unley are listed below and annotated in Figure 28:

1. Wayville Showgrounds.
    - Royal Adelaide Show (annual).
    - Fairs and expositions (sporadic).
    - Adelaide Farmers' Market (weekly/Sundays).
2. King William Road (street closure).
    - Tour Down Under (annual).
    - Gourmet Gala (annual).
3. Unley Oval.
    - SANFL games (weekly/seasonal).

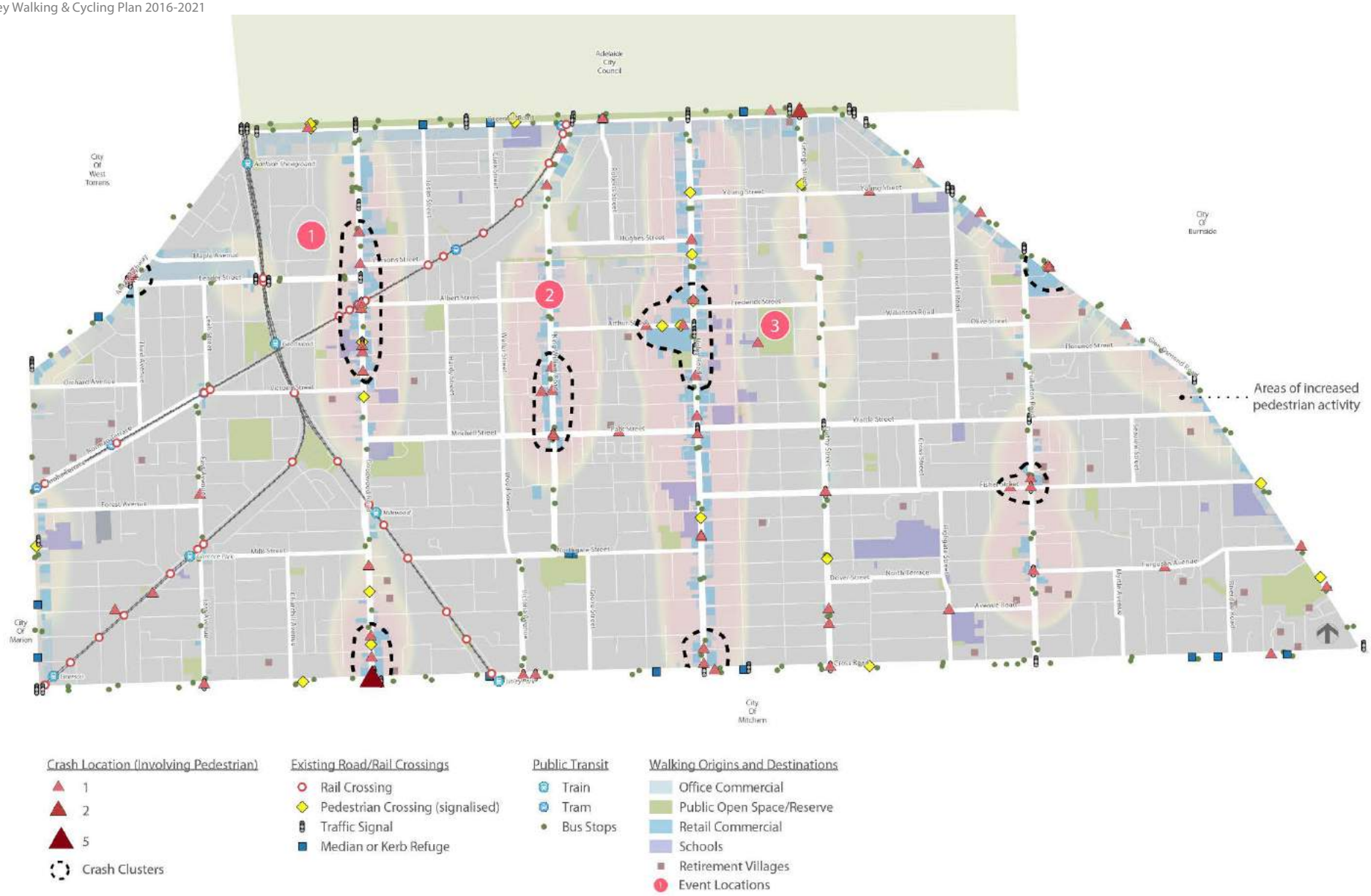


Figure 27: Map showing crash locations that involve pedestrians and areas with high pedestrian demand.

9.4. Vulnerable Pedestrians

Specific requirements of the following demographic groups must be considered.

9.4.1. School children

Children have less experience and cognitive ability than adults and are among the most vulnerable of pedestrians. High volumes of traffic at schools during arrival and pick-up times can lead to hazardous conditions, such as reduced sight distance, confusion and inconsistent driving behaviour as a result of vehicle congestion, queuing, unorganised high turnover parking areas and lack of traffic controls. Schools generally provide assistance with road crossing at the school gates during start and finish times, but additional crossing assistance may be required further afield such as:

- Signalised crossing;
- Wombat crossing;
- Emu crossing;
- Traffic calming to ensure a slow speed environment;
- Kerb extensions to reduce crossing distance and position children waiting to cross within view of oncoming motorists; and
- Refuge in the centre of the road to enable a 2-stage crossing.

9.4.2. Seniors

Localities that have significant populations of seniors, as well as popular destinations within walking distance should provide the specific requirements, as well as preferred walking conditions for them. This may include upgrades of footpaths and pedestrian crossings, seating, rest areas, lighting, shade, and artwork that tells local stories and encourages social interaction.

9.4.3. People with a disability

The Disability Discrimination Act 1992 (DDA) requires that every area open to the public should be open to people with a disability. People with a disability should expect to enter and make use of places used by the public if people without a disability can do so. Therefore, the design, construction and maintenance of walking infrastructure and access facilities must meet the needs of all users, including those with various disabilities.

While people with different abilities may have common needs, such as safe and unrestricted paths of travel, they can also have competing needs. For instance, the use of tactile surface indicators generally benefit people who are vision impaired, yet they may cause discomfort to a person in a wheelchair. In most situations, it may prove to be best practice to resolve conflicts as they arise within appropriate contexts.

The following design principles are reflected within the proposed network and have been developed in consultation with a range of peak body representatives, organisations and individuals and are extracted from the DPTI, 'Guidelines for Disability Access in the Pedestrian Environment':

- Safe and Accessible for all.
- Simple, Logical and Consistent.
- Well aligned and Clear of obstruction.
- Smooth and Accessible Ground Surface.
- Bigger, Brighter and Bolder.
- Monitor and Maintain.

10. Walking Network 2015-2020

Unlike a cycling network comprising a series of routes, every street with a footpath forms part of the walking network. A strategy that reflects demand, land use, access to public transport and local demographics has been prepared as the City of Unley's walking network 2015-2020 shown in Figure 29. Proposed shared paths and crossings have been adopted from the updated bicycle network to highlight efficiencies in streamlining improvements for both transport modes.

Main street hubs, bus routes and key links have been identified as providing for high and average pedestrian demands as per Austroads Guidelines (refer

Table 4). All remaining streets in the network serve low pedestrian demand. In addition to the dimensions provided in

Table 4, it is important that in particular areas additional space be provided for features such as lighting, signs, seating, outdoor dining and planting.

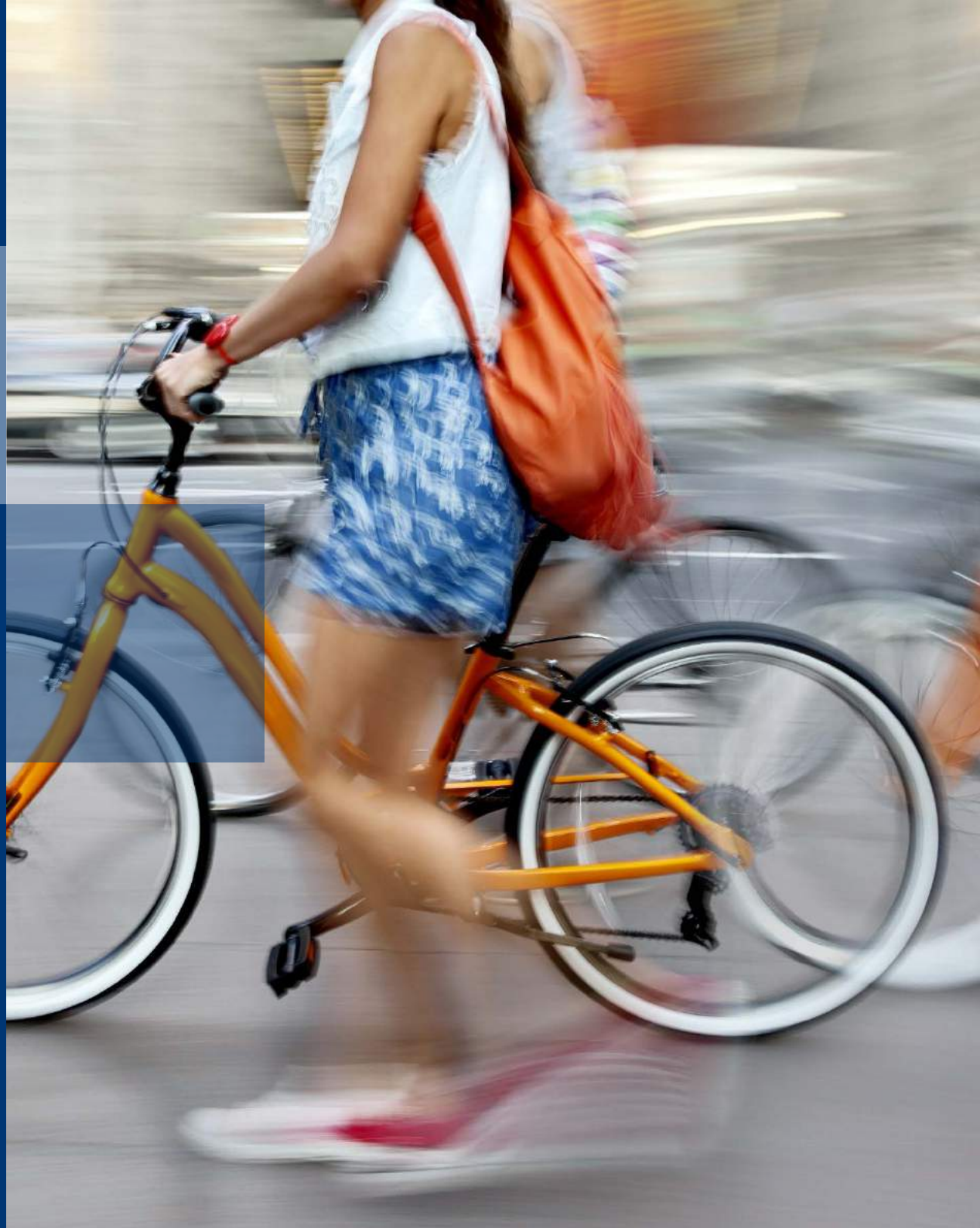
The 2015-2020 walking network will guide Council to:

- Provide footpaths wherever pedestrians will use them.
- Use footpath dimensions and geometry that provides access for all.
- Choose surface materials for safety, convenience and aesthetics.
- Manage design and location of street furniture.
- Locate and design driveways appropriately.
- Manage conflict on shared paths by good design and operation.
- Provide quality connections to public transport.

Figure 28: City of Unley walking network 2015-2020.

‘Transport networks that encourage walking and cycling will support the vitality and sustainability of communities, adding to the state’s liveability, as well as boosting economic growth.’

-SA Government (Integrated Transport and Land Use Plan)



11. Encouraging Walking and Cycling

In addition to the physical walking and cycling networks 2015-2020, there are a number of additional actions that Council can do to encourage and increase active travel. This section details a number of recommendations for Council.

11.1. Walking and Cycling Promotion

Cycling promotion seeks to encourage people to start cycling or to encourage existing riders to cycle more often. Promotion can take many different approaches, from mass-market advertising that reaches a wide audience, to programs delivered to a target market such as a specific demographic, location or business. Promotion can be quite cost-effective at changing behaviour, especially when the built environment is bicycle-friendly.

Cycling promotion that focuses on achieving specific behaviours such as commuting by bicycle can be an effective way of leveraging major investments made in infrastructure. What starts as an isolated behaviour such as commuting to work by bicycle once a week, can lead to permanent behavioural change that can last a

Examples include:

- the national 'TravelSmart' program;
- 'Ride To Work Day';
- localised events, such as those run in conjunction with the Tour Down Under; and
- using social media to promote cycling and the details of new and upgraded routes.

Recommendation:

- **Support 'Ride to Work Day' and other similar events to raise the profile of cycling within the City of Unley.**
- **Support and promote the Heart Foundation's 'Unley Walkers' group and similar events at key locations and on the Council website, see <http://activeinparks.org/activity/unley-walkers-5061-536/> .**
- **Continue to collaborate with DPTI on the 'Way2Go' program, by identifying schools which can become involved in the program and budgeting and resourcing to assist with the program implementation and any related engineering treatments.**

11.2. Infrastructure Elements

Some infrastructure elements work to encourage walking and cycling by improving safety, amenity and comfort. A lack or absence of such facilities can discourage people from considering active transport, preferring the convenience of a private vehicle. The Design Toolkit (Appendix) provides a comprehensive listing, with a short summary provided below:

- Bicycle lanes.
- Footpaths and Shared paths.
- End of trip facilities, for example:
    - secure bicycle parking; and
    - shower facilities at the workplace can encourage cyclists.
- Mid-trip facilities, such as:
    - seating;
    - drinking fountains; and
    - bicycle repair and adjustment stations.
- Bicycle hire/ bike share initiatives.

Recommendation:

- **Continue to support bike hire initiatives that provide value for money and consider cycling supportive infrastructure elements along the network where appropriate.**

11.3. City of Unley Policy

The City of Unley Development Plan contains the objectives and principles of development control relevant for new local development. The provisions within the Development Plan augment improvements for the pedestrian and cyclist environments and should be considered in the context of the actions and strategies contained within this walking and cycling Plan. Council is encouraged to adopt policies that ensure consideration of this Walking and cycling Plan when assessing all forms of development applications, including: Development Assessment, Development Plan Amendments, Structure Plans, Master Plans and other forms of land use and transport development.

The following section summarises the key aspects that are pertinent to walking and cycling.

11.3.1. Objectives: Council Wide

Objective 1: Focus development to achieve the 'Unley Strategic Vision'

"… The early village hubs and main roads which primarily developed in the late 19th Century are now some of Adelaide's iconic strip shopping and services destinations … Urban design quality will be improved by reinforcing distinctive parades of buildings, pedestrian amenity and integrated parking areas to the rear of village strips. Commuter traffic calming and accessibility to local services, and adjacent CBD, *will be improved by giving priority to pedestrian, cycle and public transport through enhanced convenience and quality*."

11.3.2. Objectives: Transportation (Movement of People and Goods)

Objective 15: A network of roads, paths and tracks, to accommodate satisfactorily a variety of vehicular, cycle and pedestrian, traffic.

Objective 16: A safe and efficient vehicular and pedestrian movement system.

Objective 17: Safe and easy movement of pedestrians across arterial roads.

Objective 25: A co-ordinated and integrated bicycle movement system which complements other vehicles movement systems.

11.3.3. Principles of Development Control: Walking and cycling

44 Development should ensure that a permeable street and path network is established that encourages walking and cycling through the provision of safe, convenient and attractive routes with connections to adjoining streets, paths, open spaces, schools, pedestrian crossing points on arterial roads, public and community transport stops and activity centres.

45 Development should provide access, and accommodate multiple route options, for pedestrians and cyclists by enhancing and integrating with:

a. open space networks, recreational trails, parks, reserves, and sport and recreation areas;

b. Adelaide's principal cycling network (Bike*Direct*), which includes arterial roads, local roads and off-road paths.

46 New developments should give priority to and not compromise existing designated bicycle routes.

47 Where development coincides with, intersects or divides a proposed bicycle route or corridor, development should incorporate through-access for cyclists.

48 Development should encourage and facilitate cycling as a mode of transport by incorporating end-of-journey facilities including:

a. showers, changing facilities and secure lockers

b. signage indicating the location of bicycle facilities

c. bicycle parking facilities provided at the rate set out in Table Un/6 – Off-street Bicycle Parking Requirements for Mixed Use and Corridor Zones.

49 On-site secure bicycle parking facilities should be:

a. located in a prominent place;

b. located at ground floor level;

c. located undercover;

d. located where surveillance is possible;

e. well-lit and well signed;

f. close to well used entrances;

g. accessible by cycling along a safe, well-lit route.

50 Pedestrian and cycling facilities and networks should be designed and provided in accordance with relevant provisions of the *Australian Standards and Austroads Guides*.

11.3.4. Off-street Bicycle Parking Requirements for Mixed Use and Corridor Zones

The following bicycle parking requirements apply to development specifically in Mixed Use and Corridor Zones.

1. In residential and mixed use development, the provision of bicycle parking may be reduced in number and shared where the operating hours of commercial activities complement the residential use of the site.
2. Residential and mixed use development, in the form of multi-storey buildings, should provide bicycle parking in accordance with the following rates:

Form of development	Employee/resident (bicycle parking spaces)	Visitor/shopper (bicycle parking spaces)
Residential component of multi-storey building/residential flat building	1 for every 4 dwellings	1 for every 10 dwellings
Office	1 for every 200 square metres of gross leasable floor area	2 plus 1 per 1000 square metres of gross leasable floor area
Shop	1 for every 300 square metres of gross leasable floor area	1 for every 600 square metres of gross leasable floor area
Tourist accommodation	1 for every 20 employees	2 for the first 40 rooms plus 1 for every additional 40 rooms

Recommendation:

- **Review current bicycle parking rates for new development (Table Un/6 - Off-street Bicycle Parking Requirements for Mixed Use and Corridor Zones) to encourage more sustainable transport options and lessen reliance on vehicle parking.**
- **Review the City of Unley Development Plan to update/improve policies for cycling and encouraging bicycle-friendly workplaces, such as:**
    - **providing end of trip facilities, such as: parking, lockers, showers within proximity of key trip generators; and**
    - **Including best practice facilities, treatments and networks in new developments.**

11.4. Enforcement

It is illegal to drive, park or stop a vehicle in a bicycle lane.

Council can assist with cyclist and pedestrian safety by enforcing the law.

Recommendation:

- **Council parking officers to seek out vehicles parked in a bicycle lane illegally.**
- **Council to liaise with SAPOL to ensure ongoing fining of motorists driving in or crossing over a bicycle lane.**

11.5. Safety Training

Cyclists have the same rights and responsibilities as any other road user. However, as private cars are the predominant type of vehicles on the road and are of larger size and can travel at higher speeds, cyclist vulnerability is increased. Evidence shows that driver behaviour is a key concern for cyclists and forms a barrier to encouraging new cyclists.

Related to this is the behaviour of pedestrians and cyclists in a mixed environment, specifically shared use paths. Conflicts between pedestrians and cyclists are infrequent, however it is the responsibility of all path users to be courteous and exercise a degree of caution.

Guidelines for using shared paths have been established by the Bicycle Network (Victoria). The main points of etiquette to observe on shared paths include:

- Be considerate of other path users;
- Keep left unless overtaking (overtake on the right);
- Ride at an appropriate speed - keep it at running pace or below (about 20-25km/h maximum);
- Wheeled traffic gives way to foot traffic;
- Ring your bell gently, call 'Passing' and slow down when passing others; and
- Move off the path if stopped.

Recommendation:

- **Provide information and generate awareness on 'shared path etiquette' in locations with a high number of pedestrians/cyclists.**
- **Engage with DPTI and MAC (Motor Accidents Commission) to consider undertaking a specific driver/cyclist awareness campaign.**
- **Promote and provide bicycle education programs at Community Centres and Libraries**

11.6. Route Information, Legibility & Wayfinding

Providing easy to access, reliable and relevant information is key to increasing the mode share of cycling. Not knowing where to find safe and convenient route information is a barrier for those who do not currently cycle. Providing information across varying media platforms increases accessibility and caters to a diversifying demographic. Examples include:

- Directional signage and pavement logos along Bikeways
- Update the City of Unley Cycle Route Map and make readily available. Distribute in letter boxes and place in cafes, convenience stores, libraries, sports clubs (etc.) throughout Unley.
- Provide localised maps of areas around schools or local shops or neighbourhood centres e.g. 3km radius and show the approximate time it takes to walk or cycle.
- Promote online maps and route information, including route difficulty ratings, such as:
    - http://maps.sa.gov.au/cycleinstead/
    - http://www.rms.nsw.gov.au/roads/using-roads/bicycles/cyclewayfinder/index.html
- Consider City of Unley smartphone apps, such as:
    - 'CycleStreets Journey Planner', which helps plan journeys and notifies users of potential route difficulties, such as steep inclines,
    - http://www.cyclestreets.net/
    - 'Bike Blackspot', which allows bicycle users to submit locational information on trouble areas could be linked to a Council data base, http://www.bikeblackspot.org/

Recommendation:

- **Plan for sufficient wayfinding, route notification and directional signage along key routes (see Figure** 12 **for recommended wayfinding routes).**
- **Ensure adequate public access to route information and maps.**
- **Consider additional media platforms for a diverse demographic.**

11.7. Data Collection and Evaluation

Council's commitment to continuous research to develop a better understanding of the barriers facing residents, and those who are interested in walking and cycling is essential. Such studies and research should also examine what factors would enable people to take up active transport, or cycle and walk more often in the City of Unley and to inform programs to support more people walking and cycling.

Research methods and objectives may include:

- Understanding the barriers and enablers of residents walking and cycling, or walking and cycling more frequently and use the results to inform the design of projects and programs.
- Smartphone applications where network/infrastructure issues can be identified/photographed by members of the community and relayed directly to Council staff for action.
- Actively work with community groups and schools to promote bicycle safety education and awareness and provide support for them to apply for funding.

Recommendations:

- **Continue to conduct Super Tuesday counts.**
- **Participate in the Super Sunday Recreation Counts along Greenways.**
- **Supplement the data with additional counts on other days (at the discretion of Council) at these select locations for comparative data.**
- **Continue to collect traffic speed and volume data.**
- **Conduct a review of the Bicycle Plan every five years.**
- **Develop a City of Unley smartphone application that members of the community can download and notify Council staff of network/infrastructure issues.**
- **Develop administrative protocols for 'End Task Administration' to update records and asset registers. When bicycle facilities are implemented tasks should include: updating GIS layers, asset registers, recording an action database to assist in future updates of the Council Bicycle Plans.**

12. 5-year Action Plan

The following table prioritises the high priority works for the next 5-years (2016-2021). However if other road projects are planned within the next 5 years, the cycling infrastructure for that road should be considered and incorporated in the new works even if it is not included in this programme.

The cost estimates for these works is approximately $1M, which equates to $5/person per year, over the 5 year life of this Plan, which according to BiXE (refer page 8) is a meaningful Council commitment to bicycle infrastructure.

It is recommended that the Plan be reviewed in 2021 for updating and to prioritise the works for 2021 to 2026. Works to be reviewed in 2021 are listed in Section 12.1.

Location	Route Type	Timing	Works	Estimated Cost (AUD)
City-wide	Low Traffic Bikeways (refer Figure 12)	Year 1	Audit routes and prepare Wayfinding Signage & Sharrows Plan. Commence installation of routes and program others for years 2-5. Prepare map of routes as routes are completed (hard copy and on-line)	$100,000.00
City-wide	Route Maintenance	Year 1	Develop maintenance program that reflects higher needs along cycling routes	In-house
City-wide	All Low Traffic Bikeways	Year 1-5	Review route network and program implementation of safe road crossings over next 5 years to suit budgets.	$5,000.00
Mike Turtur Bikeway	Shared Path	Year 1	Audit path to identify locations for surface repair, vegetation removal/addition, line marking, signage and lighting assessment. Upgrade path as required.	$50,000.00
King William Rd – Mike Turtur Shared Path to Greenhill Rd	Main Road	Year 1	Prepare designs and install works to improve link from Mike Turtur path to Greenhill Road. May include: Install one-way cycle path on west footpath, install kerb build-out at bus stop, upgrade bike lanes with chevron buffers and greening, remove (20+) carparks.	$40,000.00
King William Road / Glen Osmond Creek Greenway	Safe Road Crossing	Year 1	Median Refuge (or other treatment) to facilitate safe cyclist and pedestrian crossing of King William Rad	$10,000

Location	Route Type	Timing	Works	Estimated Cost (AUD)
Norman Tce, Leah St to Ethel St	Low Traffic Cycle Route	Year 1	Support Shared Street, traffic rearrangements. Liaise with DPTI to incorporate into their proposed Overpass project and therefore contribute funds.	N/A
Devon St South, Victoria St to Rail Line	Local Link	Year 1	Signage & Sharrows. Liaise with DPTI as part of proposed Overpass project	$5,000
Wood Street / Weller St	Low Traffic Cycle Route	Year 2	Bicycle Logos, wayfinding signage, upgrade road surface	$20,000.00
Northgate St, Wood Street to King William Rd	Main Road	Year 2	Buffered Bicycle Lanes	$5,000.00
Northgate St,	Low Traffic Bikeway connection	Year 2	Median refuge to cross Northgate Street	$6,000.00
Heywood Park	Shared Path	Year 2	Separated cyclist path through park	$45,500.00
Heywood Park, parallel to Northgate Street (to link to new pedestrian refuge in Northgate St) – Links to Wood Street	Shared Path	Year 2	Shared Path	$21,500.00
Whistler Ave, links Cross Road to Wood St Route	Low Traffic Cycle Route	Year 2	Add street to Cycling Network - signage and Sharrows	$2,200.00
Leader St	Higher Traffic Cycle Corridor	Year 2	Buffered Bicycle Lanes (+ street scaping works as part of other budget)	$20,000.00
East Tce / Cromer Pde / Canterbury Ave	Upgrade junction	Year 2	Apply for Black Spot funding	$50,000.00
Cromer Pde	Low Traffic Cycle Route	Year 2	Signage, Sharrows and Traffic calming	$6,200.00
East Tce - Cross Rd to Rail line	Higher Traffic Cycle Corridor	Year 2	Upgrade to Buffered Bike Lanes & Green Coloured at Junctions	$20,000.00

Location	Route Type	Timing	Works	Estimated Cost (AUD)
City-Wide	Shared Path Lighting	Year 2	Audit all routes for lighting upgrade and programme works	$20,000.00
Citywide	Low-Traffic Bikeways	Year 2-5	Install remaining safe road crossings as was programmed in Year 1	$200,000
City-wide	Low Traffic Bikeways (refer Figure 12)	Year 2-5	Continue wayfinding signage and Sharrows installation as per program developed in year 1. Prepare map of routes as routes are completed (hard copy and on-line)	$100,000.00
Ridge Park Reserve	Shared Path	Year 3-5	Connects to PAC on Glen Osmond Rd	$50,000.00
Riverdale / Rossington Route (Myrtle Bank Bikeway)	Low Traffic Cycle Route	Year 3-5	Signage and Sharrows + traffic calming	$10,000.00
Fisher St, Rossington Ave to Milton Ave	Higher Traffic Cycle Corridor	Year 3-5	Refuge crossings (x 2)	$12,000.00
Ferguson Ave	Low Traffic Cycle Route	Year 3-5	Reduce to 40km/h Speed Limit	$5,000.00
Glen Osmond Creek	Shared Path	Year 3-5	Commence next stage of Feasibility study	$20,000.00
Simpson Pde Culvert	Shared Path	Year 3-5	Commence Shared Path Construction	$660,000.00
Moore St and Katherine St	Low Traffic Cycle Route	Year 3-5	Cyclist access through one-way street sections	$2,000.00
Goodwood Road Footpath, Young St to Leader St	Convert Footpath to Shared Path (via PAC at Young St)	Year 3-5	Shared path logos on footpath, pavement stickers (Cyclists give way to pedestrians)	$5,000.00
Park St - Unley Rd to King William Rd	Higher Traffic Cycle Corridor	Year 3-5	Feasibility study/concept design for bicycle lanes / parking removal. Programme works.	$10,000.00
Mitchell St - King William Rd to Weller St	Higher Traffic Cycle Corridor	Year 3-5	Feasibility study for bicycle lanes / parking removal. Programme works.	$10,000.00

12.1. Action Plan – 5 Years Plus

To identify the priority works for the next 5 years, the entire walking and cycling network was mapped the actions beyond the next 5-years required to work towards completing this network are illustrated in Figure 25. The identification (ID) numbers from that figure correlate to the tables below (Table 5 Road Crossings, and Table 6 Routes), which list the actions into the future. It is envisaged that this Plan will be reviewed in 2021 and another 5 years of priorities will be identified.

Table 5: Future Crossings Actions (5-Years Plus)

ID	Location (Road Crossing)	Action
1	Fullarton Rd / Carlton St	Refuge Crossing
2	Wattle St / Cambridge St	Modify roundabout to radial design
3	Fisher St / Cambridge St	Modify Roundabout to radial design
4	Wattle St / Cross St	Refuge Crossing
5	Wattle St / Cootra Ave	Refuge Crossing
6	Victoria St / East Ave / Aroha Tce	Intersection Rearrangement / half road closure.
7	King William Rd / Simpson Pde	Refuge (or consider Signals)
8	George St / Young Street	Kerb ramp through road closure
9	Windsor St / HIll St / Shared Path	Review junction for access / safety / signage
10	Wattle St / Windsor St	Refuge Crossing
11	Thomas St / Mornington Rd	Kerb ramp through road closure
12	Roberts St / Miller St / Park Lane	Junction rearrangement
13	Mitchell St / Weller St	Refuge Crossing
14	Westall St / Park St / Clarence St	Refuge crossings

ID	Location (Road Crossing)	Action
15	Joslin St / Parsons St / Tramway	Modify and improve corner crossing
16	Kenilworth Rd / Hill St / Arnold St	Refuge Crossing
17	Nicolls St / Nairne St	Intersection Upgrade
18	Rossington Rd / Fisher St	Refuge Crossing
19	Fisher St / Milton St	Refuge Crossing
20	Wattle St / Milton Ave	Refuge Crossing
21	Wattle St / Nelson St	Refuge Crossing
22	Fisher St / Highgate St	Refuge Crossing
23	Fisher St / Cross St	Refuge Crossing
24	King William Rd / Commercial Rd	Refuge Crossing
25	Goodwood Station	Support/lobby DPTI for Grade Separated Xing
27	Arundel Ave / Railway	Improve pedestrian access and crossing
28	Millswood Station / Railway	Improve pedestrian access and crossing
29	Cromer Pde / Railway	Improve pedestrian access crossing of rail line
30	Arthur St / Mornington Rd / Beech Ave	Install refuge crossing
31	Northgate St / Heywood Shared Path	Install refuge to connect shared path
33	King William Rd / Greenhill Rd	Cyclist signalised crossing
34	East Ave / Mills St	Upgrade refuge
36	Unley Rd / Park St	Install bike push button and cyclist storage

ID	Location (Road Crossing)	Action
37	Unley Rd / Wattle St	Install bike push button and cyclist storage
38	Glen Osmond Shared Path	Cyclist priority
39	Glen Osmond Shared Path	Cyclist priority
40	Glen Osmond Shared Path	Cyclist priority
41	Northgate St / King William Rd / Heywood Shared Path	Install refuge and kerb ramps at intersection
42	George St / Glen Osmond Shared Path	Upgrade refuge crossing

Table 6: Future Routes Actions (5-Years Plus)

Route ID	Section ID	Location (Route)	Route Type	Recommended Treatment	Actions	Length (m)
1	1.1	Norman Tce, Leah St to Ethel St	Low Traffic Cycle Route	Shared Street	Traffic Calming	219
1	1.2	Railway Tce, Rail line to rail xing near Devon St Nth	Low Traffic Cycle Route		Existing	40
1	1.3	Railway Tce	Low Traffic Cycle Route	Mixed traffic Street	Existing	659
1	1.5	King William Rd, Greenhill Rd to Shared Path	Shared Path	New or Upgrade Shared Path	Mark footpath with shared path logos	76

Route ID	Section ID	Location (Route)	Route Type	Recommended Treatment	Actions	Length (m)
1	1.4	Mike Turtur Bikeway	Shared Path	Existing Shared Path	Surface uneven in places - assess and repair where required. Assess lighting and improve where required	1085
2	2.4	Nairne Tce	Low Traffic Cycle Route	Mixed traffic Street	Existing	200
2	2.3	Lyons Pde	Low Traffic Cycle Route	Mixed traffic Street	Existing Sharrows	188
2	2.2	Cromer Pde	Low Traffic Cycle Route	Traffic Calming Required	Signage, sharrows and Traffic calming	1111
2	2.1	Dryden Rd	Local Link	Mixed traffic Street	Links to South Road crossing underpass	117
3	3.2	Churchill Ave / Lloyd Ave / Millswood Crs	Low Traffic Cycle Route	Traffic Calming Required		628
3	3.3	Sasmee Park Link	Shared Path	New or Upgrade Shared Path		52
3	3.1	Cross Rd	Shared Path	New or Upgrade Shared Path	Links route to PAC	44
4	4.1	Whistler Ave	Low Traffic Cycle Route	Mixed traffic Street	Add street to Cycling Network - signage and sharrows	408
4	4.2	Heywood Park	Shared Path	New or Upgrade Shared Path	Separated cyclist path through park 1.5m wide (or similar)	182
4	4.16	Little Charles St	Low Traffic Cycle Route	Mixed traffic Street	Add to network	63

Route ID	Section ID	Location (Route)	Route Type	Recommended Treatment	Actions	Length (m)
4	4.17	Hughes St, Little Charles St to Roberts St	Low Traffic Cycle Route	Mixed traffic Street	Add to network	181
4	4.18	Roberts St	Low Traffic Cycle Route	Traffic Calming Required	Add to network	520
4	4.19	Roberts St	Low Traffic Cycle Route	Mixed traffic Street	Add to network - links to refuge at Greenhill Rd	90
4	4.3	Heywood Park	Shared Path	New or Upgrade Shared Path	Shared Path parallel to Northgate Street (to link to ped refuge)	85
4	4.15	Ltle Charles / Beech St / Austell St	Low Traffic Cycle Route	Mixed traffic Street		407
4	4.14	Mornington St	Low Traffic Cycle Route	Mixed traffic Street		214
4	4.12	Barrow St	Low Traffic Cycle Route	Mixed traffic Street		110
4	4.11	Pitchers Lane	Shared Path	New or Upgrade Shared Path		42
4	4.9	Opey Ave	Local Link	Mixed traffic Street		114
4	4.8	Russell St	Low Traffic Cycle Route	Mixed traffic Street		140
4	4.7	Mann St	Low Traffic Cycle Route	Mixed traffic Street		146
4	4.6	Esmond St	Low Traffic Cycle Route	Mixed traffic Street		100
4	4.5	Westall St	Low Traffic Cycle Route	Traffic Calming Required		246
4	4.4	Westall St	Low Traffic Cycle Route	Mixed traffic Street	Signage and sharrows	199

Route ID	Section ID	Location (Route)	Route Type	Recommended Treatment	Actions	Length (m)
4	4.13	Thomas St	Low Traffic Cycle Route	Traffic Calming Required	Signage and sharrows	146
5	5.1	Rugby/Porter Bicycle Boulevard	Low Traffic Cycle Route	Mixed traffic Street	Currently being designed	2803
6	6.1	West Tce / High St	Low Traffic Cycle Route	Mixed traffic Street	New route to connect to PAC	648
6	6.2	Highgate St	Low Traffic Cycle Route	Mixed traffic Street		598
6	6.3	Fisher St	Low Traffic Cycle Route	Traffic Calming Required		106
6	6.4	Cross St	Low Traffic Cycle Route	Mixed traffic Street		333
6	6.5	Cootra Ave	Low Traffic Cycle Route	Mixed traffic Street		194
6	6.6	Wallis St	Low Traffic Cycle Route	Mixed traffic Street		138
6	6.7	Castle St, Wallis St to Fuller St	Low Traffic Cycle Route	Mixed traffic Street		508
6	6.8	Castle St, Young St to Fuller St	Local Link	Traffic Calming Required	Links to east-west route	419
7	7.1	Cross Rd, PAC to Riverdale Rd	Shared Path	New or Upgrade Shared Path	On footpath	60
7	7.2	Riverdale / Rossington Route (Myrtle Bank Bikeway)	Low Traffic Cycle Route	Traffic Calming Required	Signage and sharrows + traffic calming	879
7	7.3	Fisher St, Rossington Ave to Milton Ave	Higher Traffic Cycle Corridor	New or Upgrade Bike Lanes	Refuge crossings (x 2)	168
7	7.4	Milton Ave	Low Traffic Cycle Route	Mixed traffic Street		337

Route ID	Section ID	Location (Route)	Route Type	Recommended Treatment	Actions	Length (m)
7	7.5	Moore St and Katherine St	Low Traffic Cycle Route	Mixed traffic Street	Cyclist access through one-way street sections	325
8	8.2	Barr-Smith Ave	Low Traffic Cycle Route	Traffic Calming Required		289
8	8.3	Ferguson Ave	Low Traffic Cycle Route	Traffic Calming Required	Reduce to 40km/h Speed Limit	948
8	8.4	Carlton St, Fullarton Rd to Duthy St	Low Traffic Cycle Route	Traffic Calming Required		1014
8	8.5	Winchester St	Low Traffic Cycle Route	Mixed traffic Street		425
8	8.6	Marlborough St	Low Traffic Cycle Route	Mixed traffic Street	Links PAC to Porter St	190
8	8.7	Commercial St	Low Traffic Cycle Route	Mixed traffic Street	East-west link	620
8	8.11	Ormonde Ave / Millswood Cres	Low Traffic Cycle Route			969
8	8.1	Ridge Park Reserve	Shared Path	New or Upgrade Shared Path	Connects to PAC on Glen Osmond Rd	216
8	8.8	Avenue St	Low Traffic Cycle Route	Traffic Calming Required		632
8	8.12	Ellesmere Tce, Millswood - link	Shared Path	New or Upgrade Shared Path	Signage and sharrows	5
9	9.2	Goodwood Road Footpath	Shared Path	New or Upgrade Shared Path	Shared path logos on footpath	36

Route ID	Section ID	Location (Route)	Route Type	Recommended Treatment	Actions	Length (m)
9	9.3	Goodwood Road Footpath	Shared Path	New or Upgrade Shared Path	Shared path logos on footpath	37
10	10.1	Leader St	Higher Traffic Cycle Corridor	New or Upgrade Bike Lanes	Buffered Bicycle Lanes	614
10	10.2	Leader St, Goodwood Rd to rail line	Higher Traffic Cycle Corridor	New or Upgrade Bike Lanes	Upgrade existing bike lanes to buffered lane	464
11	11.1	Duthy St	Higher Traffic Cycle Corridor	New or Upgrade Bike Lanes	Green pavement at intersections & upgrade exisitng lanes to buffered lanes	1967
11	11.2	Maud St	Shared Path	Existing Shared Path	Existing shared path	80
11	11.3	Maud St	Local Link	Mixed traffic Street	Direct route from Duthy St to Porter St	266
12	12.1	Wattle Street	Higher Traffic Cycle Corridor	Other Treatment - refer Action Plan	Traffic calming required	922
12	12.2	Wattle St	Higher Traffic Cycle Corridor	Other Treatment - refer Action Plan		1010
12	12.3	Wattle Street	Higher Traffic Cycle Corridor	Other Treatment - refer Action Plan		621
12	12.4	Park St - Unley Rd to King William Rd	Higher Traffic Cycle Corridor	Other Treatment - refer Action Plan	Feasiblity study for bicycle lanes / parking removal	708

Route ID	Section ID	Location (Route)	Route Type	Recommended Treatment	Actions	Length (m)
12	12.5	Mitchell St - King William Rd to Weller St	Higher Traffic Cycle Corridor	Other Treatment - refer Action Plan	Feasiblity study for bicycle lanes / parking removal	248
12	12.7	Angus St	Local Link	Traffic Calming Required	Add	677
12	12.8	Victoria St	Local Link	Traffic Calming Required	Links Goodwood Rd PAC to Greenway	324
12	12.9	Victoria St, Marino Rocks Greenway to Mike Turtur Bikeway	Local Link	Traffic Calming Required	Existing	412
13	13.2	Joslin St	Low Traffic Cycle Route	Traffic Calming Required		543
13	13.1	Joslin St, Mike Turtur Bikeway to Le Hunte St	Low Traffic Cycle Route	Traffic Calming Required	Signage, sharrows and Traffic calming	134
13	13.2	Parsons St	Local Link	Mixed traffic Street		328
14	14.1	East Tce - Cross Rd to Rail line	Higher Traffic Cycle Corridor	New or Upgrade Bike Lanes	Upgrade to Buffered Bike Lanes & Green Coloured at Junctions	655
14	14.2	East Ave	Main Road	Other Treatment - refer Action Plan	No space for Bike Lanes unless car parks removed	692
15	15.2	Hill St	Low Traffic Cycle Route	Traffic Calming Required		466
15	15.3	Arnold St / Hone St	Low Traffic Cycle Route	Mixed traffic Street		380
15	15.4	Fullarton Rd, Hone Street to Glen Osmond Rd	Shared Path	New or Upgrade Bike Lanes	Install logos on footpath, behind bus stop	73

Route ID	Section ID	Location (Route)	Route Type	Recommended Treatment	Actions	Length (m)
15	15.1	Henry Codd Reserve	Shared Path	New or Upgrade Shared Path		38
16	16.2	Gordon St	Local Link	Mixed traffic Street		273
17	80.1	Victoria Avenue	Main Road	New or Upgrade Bike Lanes	Bus route, high traffic volumes & speed.	590
17	17.1	Aroha Tce	Low Traffic Cycle Route	Mixed traffic Street	LInks to rail crossings to shared path	459
17	17.2	Aroha Tce	Low Traffic Cycle Route	Traffic Calming Required		511
18	18.7	Culvert St to Mike Turtur - Shared path along creek	Shared Path	Other Treatment - refer Action Plan	Future link - investigate feasibility	141
18	18.3	Glen Osmond Creek	Shared Path	New or Upgrade Shared Path	Feasibility study	2250
18	18.5	Glen Osmond Creek Shared Path	Shared Path	New or Upgrade Shared Path	Feasibility study	1627
18	18.6	Simpson Pde Culvert	Shared Path	New or Upgrade Shared Path	Shared Path	250
18	18.1	Ridge Park Reserve Trail	Shared Path	New or Upgrade Shared Path		330
18	18.4	Windsor St	Local Link	Mixed traffic Street	Construct after Glen Osmond Creek Route completed	710

Route ID	Section ID	Location (Route)	Route Type	Recommended Treatment	Actions	Length (m)
19	19.1	Wilberforce Walk	Shared Path	New or Upgrade Shared Path	Upgrade walk to shared path	787
19	19.2	Anzac Hwy	Shared Path	New or Upgrade Shared Path	Connect to PAC	98
20	20.1	Gray St	Local Link	Mixed traffic Street		284
20	20.2	Forest Ave	Local Link	Mixed traffic Street		394
21	21.1	Thomas St	Local Link	Traffic Calming Required	Local link	325
21	21.2	Thomas St, Mornington St to Unley Rd	Local Link	Traffic Calming Required		234
22	22.1	Kneebone St / Boffa St	Local Link	Mixed traffic Street		284
23	23.1	Albert St, Goodwood Rd to John St	Local Link	Mixed traffic Street	Signage and Sharrows	514
24	24.2	Young St	Local Link	Traffic Calming Required	Links to PAC to showgrounds	759
24	24.4	Young St,Robert ST to Unley Rd PAC	Local Link	Traffic Calming Required	Connects Avenue Rd west of rail line	390
24	24.6	Young St, George St to Glen Osmond Rd	Local Link	Mixed traffic Street	Cyclists dismount to access PAC on Unley Road	710
24	24.1	Goodwood Road, Young St to Leader ST	Main Road	New or Upgrade Shared Path	Shared Path on footpath (links Young St to Leader St via PAC)	

Route ID	Section ID	Location (Route)	Route Type	Recommended Treatment	Actions	Length (m)
24	24.1	Goodwood Road, Young St to Leader St	Main Road	New or Upgrade Shared Path	Shared Path on footpath (links Young St to Leader St via PAC)	421
25	25.1	Fullarton Rd, Village	Main Road	Traffic Calming Required	Reduce to 40km/h through Highgate Village	174
26	26.1	Rose Tce	Local Link	Mixed traffic Street	Existing	255
26	26.1	Unley Rd, Culvert St to Wattle St	Main Road	Traffic Calming Required	Existing	860
27	27.1	Unley Road, full length	Main Road	Other Treatment - refer Action Plan	Extend Clearway hours - liaise with DPTI	2721
28	28.1	George St	remove	Mixed traffic Street	No space for bike lanes unless carparking removed	755
29	29.1	Le Hunte St	Local Link	Mixed traffic Street		434
29	29.2	Bartley Cres	Local Link	Mixed traffic Street		474
30	30.6	Unley Rd, Commercial Rd to Marlborough St	Shared Path	New or Upgrade Shared Path	Shared path logos on footpath	45
32	32.2	Ningana Ave to rail xing	Low Traffic Cycle Route	New or Upgrade Shared Path	Connects Ningana Ave to Vardon Tce	22
32	32.1	Jellicoe Ave / Ningana Ave	Low Traffic Cycle Route	Traffic Calming Required	Belair Line Greenway	999

Route ID	Section ID	Location (Route)	Route Type	Recommended Treatment	Actions	Length (m)
32	32.16	Belair Line Greenway	Shared Path	New or Upgrade Shared Path	Feasibility Study	212
32	32.5	Arundel St	Low Traffic Cycle Route	Mixed traffic Street		257
32	32.3	Vardon Tce	Low Traffic Cycle Route	Mixed traffic Street		122
32	32.4	Rail Reserve - Goodwood Rd Overpass	Shared Path	New or Upgrade Shared Path	Feasibility study for shared path along rail line	176
32	32.11	Rail Reserve - Northgate St to Malcolm St	Shared Path	New or Upgrade Shared Path	Feasibility study for shared path along rail line	215
32	32.12	Nanthea Tce South	Low Traffic Cycle Route	Mixed traffic Street	Belair Line Greenway	324
32	32.13	Belair Line Greenway link	Shared Path	New or Upgrade Shared Path		57
32	32.14	Nanthea Tce North	Low Traffic Cycle Route	New or Upgrade Shared Path		330
32	32.14	Sasmee Park	Shared Path	New or Upgrade Shared Path		270
33	33.4	Wood St	Low Traffic Cycle Route	Traffic Calming Required	Upgrade/replace existing streetscaping / traffic calming	170
33	33.2	Commercial Rd, King William Rd to Wood St	Low Traffic Cycle Route	Mixed traffic Street	Signage and sharrows	264

Route ID	Section ID	Location (Route)	Route Type	Recommended Treatment	Actions	Length (m)
33	33.3	Wood St	Low Traffic Cycle Route	Traffic Calming Required	Upgrade/replace existing streetscaping / traffic calming	369
33	33.5	Wood St	Low Traffic Cycle Route	Traffic Calming Required	Upgrade/replace existing streetscaping / traffic calming	664
33	33.6	Albert St	Low Traffic Cycle Route	Mixed traffic Street	Add -Link to Bikeway until Simpson Pde constructed	136
33	33.7	John St	Low Traffic Cycle Route	Mixed traffic Street	Add -Link to Bikeway until Simpson Pde constructed	202
33	33.8	Bendall Ave	Low Traffic Cycle Route	Mixed traffic Street	Signage & sharrows	76
33	33.9	Weller St	Local Link	Traffic Calming Required	Resurface road	183
33	33.1	Commercial Rd, King to Westall St	Low Traffic Cycle Route	Mixed traffic Street	Signage & sharrows	100
34	34.1	Wood St	Low Traffic Cycle Route	Traffic Calming Required		272
34	34.2	Heywood Park - Footpath parallel to Northgate St (to Wood St)	Shared Path	New or Upgrade Shared Path	Shared Path	85
35	35.2	Northgate St, Victoria Ave to King William Rd	Main Road	New or Upgrade Bike Lanes	Buffered Bicycle Lanes - or traffic calming	171
35	35.3	King William Rd	Main Road	Other Treatment - refer Action Plan	No space for separation.	1856

Route ID	Section ID	Location (Route)	Route Type	Recommended Treatment	Actions	Length (m)
35	35.4	King William Rd	Main Road	Other Treatment - refer Action Plan	No space for separation	228
35	35.5	King William Rd - Park Lane to Greenhill Rd	Main Road	New or Upgrade Bike Lanes	Improve design of road / footpath for cyclists - review car parking removal, buffered bicycle lanes, footpath logos	79
36	36.1	Simpson Pde	Local Link	Traffic Calming Required	Temporary route until Simpson Pde Culvert installe	248
37	37.1	Greenhill Rd, north footpath	Shared Path	New or Upgrade Shared Path	Partner with ACC & DPTI for Shared Path	2917
38	38.1	Devon St South	Local Link			226
39	39.1	Anzac Highway	Main Road	New or Upgrade Bike Lanes	Liaise with DPTI re: future kerb realignment to make space for bike lane	1542
39	39.2	South Rd, Anzac Hwy to Forest St	Main Road	New or Upgrade Bike Lanes	South Rd Upgrade works	442
39	39.3	South Rd, Cowper Rd to Cross Rd	Main Road	New or Upgrade Bike Lanes	South Road Upgrade works	377
39	39.4	Cross Rd, South Rd to West Tce	Main Road	Existing Bike Lanes	Existing	4191
39	39.58	South Rd, Cowper St to Forest St	Main Road	Other Treatment - refer Action Plan	Future Bicycle lanes, South Rd Upgrade	777

Route ID	Section ID	Location (Route)	Route Type	Recommended Treatment	Actions	Length (m)
39	39.6	Greenhill Rd	Main Road	Existing Bike Lanes	Existing	2975
39	39.7	Cross Rd, West St to Glen Osmond Rd	Main Road	New or Upgrade Bike Lanes	Futre bike lanes planned by DPTI (next 5 yrs)	2305
40	40.1	Malvern Ave	Local Link	Mixed traffic Street		120
40	40.2	Malvern Ave	Local Link	Mixed traffic Street		63

13. Appendices

Appendix A: Consultation

1. Unley Bicycle User Group (BUG) Workshop Summary

Where and when: Tuesday 22nd September 2015, City of Unley Offices.

Comment from Unley BUG	InfraPlan Response
It is recognised that the Rugby/Porter Bikeway will be a preferred route by some cyclists, however bicycle lanes are still required on Unley Road for commuter cyclists. A long-term vision for cycling along this corridor is required.	Agreed and plan updated.
Illegal parking in bicycle lanes needs to be enforced and fines applied.	Agreed and plan updated.
Cyclist infrastructure is required in Victoria Avenue – this is a critical route and busy, wide road.	Agreed and plan updated – this will be subject to consultation.
Cyclist infrastructure is required along entire length of East Avenue and Leah Street.	Cycle lanes will not fit within the road reserve of East Ave north of the rail line. Therefore, signage is proposed to alert northbound cyclists of the route diverting to the Greenway. East Ave can still be used by confident cyclists without bicycle lanes.
Install Bike Boxes at Wattle Street/Unley Road signals.	Agreed and plan updated.
Cyclist priority is required along Culvert Street and Charles Walk – cyclists should not need to Give Way at all crossing points.	Agreed and concept design added to Plan.
Safe crossing is required at Glen Osmond Creek Route & George Street crossing (access to School).	The narrow road width of George Street restricts a wider refuge at this location, however it is noted for Council to review this site for improvement.
Traffic signals at Young Street / Glen Osmond Road take a long time to react. This is an important crossing for cyclists.	Noted and Action for Council to discuss signal timing with DPTI added to report.
Ensure network links across Council boundaries to other cycle routes.	This was done. Maps have been updated to show bike routes in adjacent councils.
Crossing of Northgate Street – consider raised plateau junction.	Agreed and added to Plan.

Fisher St may be better route than Wattle St – to be assessed.	Fisher St was assessed and the width is not sufficient to provide car parking and bicycle lanes to Australian Standards. Traffic volumes are around 6,000vpd and speed above 50km/h. Therefore, Wattle Park route remains.
Change Church St route to Avenue Road.	Plan updated.
Weller Street – on-street car parking = poor route and poor sight distance.	Noted. Plan recommends street-scaping on Weller to improve cycling. This route is a major Low-Traffic Bikeway and Bicycle Boulevard and high quality cyclist infrastructure is mandatory.
Roundabouts need to be considered in network improvements.	Yes, included in Action Plan.
Mike Turtur Bikeway/Greenhill road crossing is dangerous for cyclists.	Yes, Action included in Action Plan.
Consider Windsor street as a future link and provide sharrows – low volume 30km/h roadway.	This route would be appropriate when the Glen Osmond Route is completed. Until then, Castle St is the preferred route.
Crossing of King William road at Simpson Parade/Charles walk – needs a refuge.	Agreed, included in Action Plan.
Consider changing pavement colours/road surface to make cars feel like they're in a different territory.	This is a good traffic calming device, added to Plan.
Link though Heywood park may be dangerous for park users if it is used for fast commuter cyclists.	Fast commuter cyclists would be expected to continue to use Victoria Avenue. The Heywood Park link would form part of the Low-Traffic Bikeway.
Remove end of bike lane signs at council boundaries if they do continue.	Signage must be installed/modified to meet Australian Standards. This action is included in Action Plan.

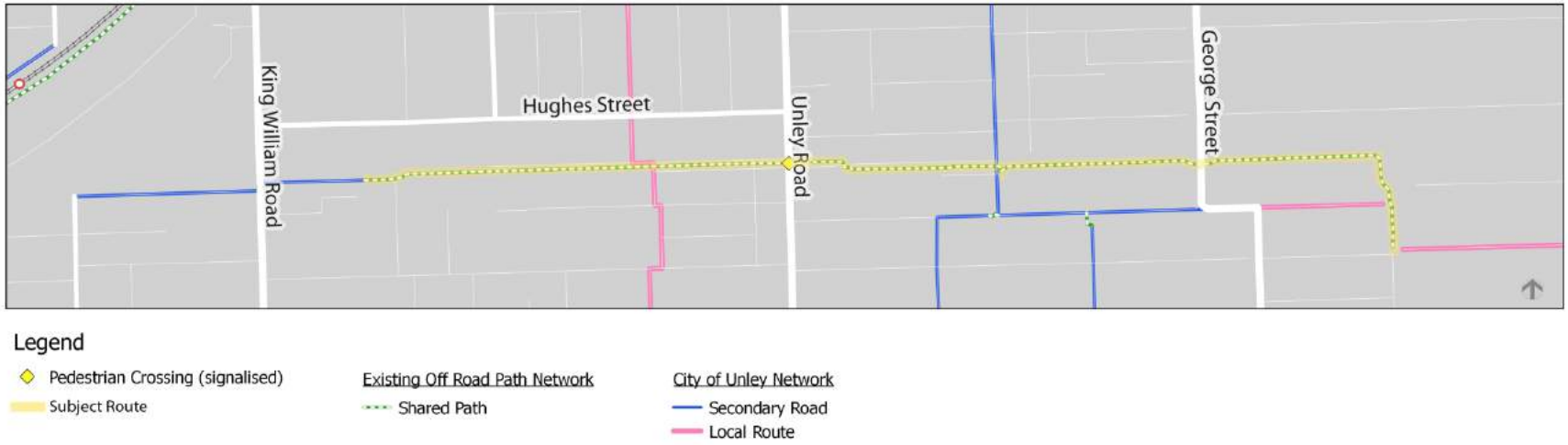
Appendix B: Cyclist Collision Map

Reported Cyclist Collisions 2010-2014

Appendix C: Safety Inspection of Routes

Cycle Route Site Inspections

Route: Glen Osmond Creek Shared Path



The Glen Osmond Creek Shared Path is an enjoyable east-west route that links the Windsor Street walking trail to King William Road. At Unley Road there is a safe signalised crossing, but no crossing is provided at King William Road. The path has several names ie, Charles Walk, Culvert Street, Glen Osmond Creek trails, and therefore its identification and destinations are not intuitive. Wayfinding would be improved if the route is named and signed consistently at each point of access (eg, Unley East-West Bikeway). Additional improvements include better lighting, signage, access points and priority at driveway crossings. The path terminates at the Council Depot carpark with some confusing signage and then terminates at King William Road without a safe crossing point.

The path has potential for a direct extension to link to the Mike Turtur Bikeway via a new path along Simpson Parade, Trevalyn Street and Bendall Avenue. With significant additional works, this path could extend eastwards to Ridge Park in the future.

The site inspection photographs, comments and recommendations are listed below.

Location	Photo	Deficiency	Action	Ranking
Windsor Street / Marion Street		• Poor identification that shared path route exists • Poor ramp access/egress	• Signage to identify route name and destination • Upgrade access from road to shared path	High
Windsor Street		• Windsor Street Linear Reserve is not wide enough for a shared path. This is a lost opportunity to continue the shared path further. 'No bicycles' signs are installed at every access point to path.	• Increase path width to 3 metres at time of next path upgrade	
Numerous locations throughout		• Lifted, uneven surface	• Upgrade surface	Medium

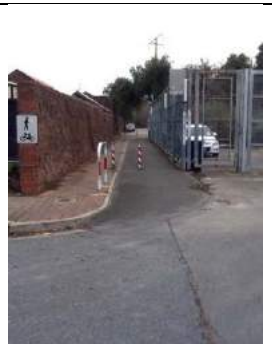
Exit to Marion Street		• Poor path and ramp access to 90 degree bend in road with pavement bar island around bend	• Review traffic speed and sight distance around bend. Improve access into path from all directions. • Install hand rails	Medium
Numerous locations		Give-Way sign is sized & located for roadways (R1-2A - 750mm high), instead of paths	Replace sign with small size (375mm high) and locate at lower height for visibility for cyclists	Low
Numerous locations		• Worn pavement markings	Upgrade pavement marking	Medium

Numerous locations		• Longitudinal cracking	Repair / replace pavement	High
Numerous locations		• Edge deterioration	Monitor and repair as required	medium
Access to/from Maud Street		Narrow path, not signed for cyclists	Upgrade to shared path	High

Near Henry Codd Reserve		• Bin close to edge of path, dark colour	Ensure all furniture is at least 300mm from edge of path and easily visible at night (eg, light colour, retro-reflective tape, hazard marker as required)	High
Just north of Maud Street		• Poor sight distance at bend	Review feasibility to cut-back fence alignment for sight distance	Low
Pedestrian/cyclist link from Leister Hotel car park		• Poor sight distance to pedestrians/cyclists from carpark • Poor give way sign – likely ignored	• Consider slatted wooden fence that allows visibility through • Paint surface of path to alert cyclists of crossing • Remove Give Way sign & consider custom sign (ie, watch for cyclists)	High

Numerous locations		• Overgrown foliage	Review maintenance procedures to ensure path is clear	Mediumn
Crossing at George Street		• Incorrect GW sign • Narrow kerb ramp • Narrow central refuge	• Replace GW sign with small size (375mm high) and locate at lower height for visibility for cyclists • Increase kerb ramp to full width of shared path	Medium
Numerous locations at road crossings		• End sign not required as path continues over road crossing	• Remove shared path and end sign	Low

Rugby/Porter		• Wall possible hazard, particularly in low-light conditions	• Install reflective delineation marker on wall	
Driveway across path to meals on wheels (and similar driveway crossings in this path section)		• Path end sign not required • Give way sign size incorrect • Cyclists need to give way at every driveway	• Replace GW sign with small size • Remove path end sign • Concept design required to upgrade these driveway crossings. Assess priority on a case-by-case basis - consider changing priority so that vehicles give way to bikes. • Consider pavement messages / coloured pavement to alert cyclists/motorists of crossing	Medium
Culvert Street		• Low concrete walls	• Add edge line and reflective paint increase clearance to, and visibility of walls	High

		• Sharp bends and corner hazards • Poor lighting	• Remove corners and reconstruct as curved radii with reflective paint	High
Just east of Unley Road **(and numerous locations)**		• Signs and light poles within path	• Paint approach edgelines around objects to increase visibility. Install edge delineator sign to light pole	High
Through Council Depot		• Bollard in centre of path creates squeeze point • Edge of metal cage	• Assess requirement for bollard. Remove if possible. If not, install approach linemarking as per Austroads. • Install pavement shared path logos • Install edge delineator sign on corner of metal cage	High

		• Confusing signs. End sign on RHS and path sign on LHS •	• Remove end sign • Install pavement logos	Medium
		• Path access via Council Depot carpark. Signed as Shared Zone at King William Road end only.	• Mark shared path through carpark to alert motorists of the potential presence of cyclists and pedestrians • Review legality of Shared Zone and ensure consistent signage at both ends of car park	

Route: Weller Street / Wood Street / Victoria Avenue

This north-south route extends from Cross Road to the Mike Turtur Bikeway and is a parallel, alternative route to busy King William Road. North of Northgate Street, the route follows streets with low traffic volumes, but Northgate Street and Victoria Avenue carry around 9,000 vehicles per day, are signed at 50km/h and are bus routes. Therefore, Victoria Avenue and Northgate Street require cyclist separation to comply with Australian Guidelines and provide a better level of comfort for cyclists. This route would be significantly improved if either bicycle lanes were installed in Victoria Avenue and Northgate Street or an alternative route is provided for cyclists who feel intimidated riding in traffic.

The one-way slow points in Wood Street and Weller Street aim to reduce traffic speed but observations found that the low traffic volumes allowed motorists to track in the centre of the road avoiding any need to slow down to deflect horizontally. Therefore, the slow points create a narrow squeeze points for cyclists. Council has informed us that approximately 40% of traffic on this route is 'through' traffic avoiding King William Road. Parallel Slow Points are found to be effective only if traffic volumes force vehicles to give way to each other. Otherwise, a raised platform at the slow point is also required or the slow points need to be angled to force the horizontal manoeuvre.

This route is ideal for a north-south bicycle boulevard (similar to Rugby/Porter), and therefore through traffic should be dissuaded, without significantly impacting on local residents. The existing slow points should be replaced with another form of traffic calming that slows traffic down (eg, angled slow points or raised, parallel slow points), and must include a cyclist cut-through. Traffic diversion should also be considered to remove any unnecessary through traffic back onto King William Road.

Some signage exists, but it is not complete or intuitive. Increased directional and destination signage together with Sharrow line-marking would raise the status and usage of this route.

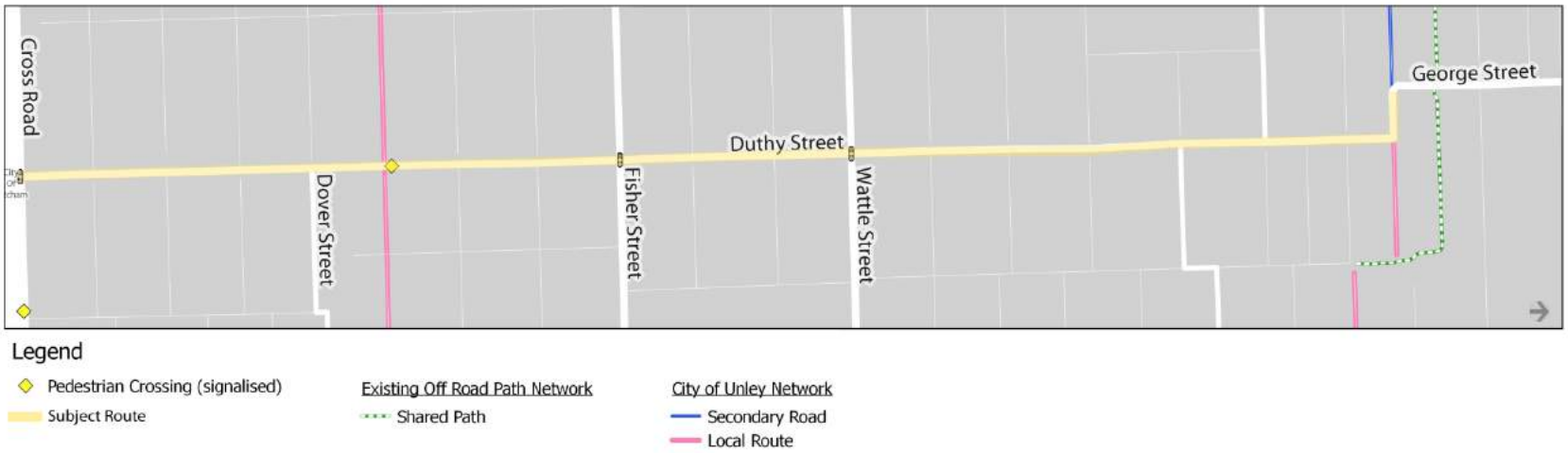
The site inspection photographs, comments and recommendations are listed below.

Location	Photo	Deficiency	Action	Ranking
• **Entire north-south Route**		• Victoria Ave carries high traffic volume and is a bus route • Poor wayfinding signage	• Consider bicycle lanes on Victoria Avenue or find alternative route (eg Whister Ave and Heywood Park) • Route signage strategy required. Name route (eg, Unley Park to City Route, and provide signage at each turn) • Install sharrows for entire north-south route	High
• **Weller St**		• Rough uneven surface from patching • Debris on road	• Resurface roadway	High

		• Redundant BikeDirect signage	• Remove all BikeDirect signage	High
Weller St / Mitchell St junction		• Wide open crossing	• Review safety of road crossing. Note: Road humps create slow traffic on Mitchell Street but delineation for cyclists is required	High
Wood St, near Wooldridge St		• One lane slow point • Squeeze point for cyclists • Low traffic volume means vehicles don't need to slow down	• Review street for new traffic calming/diversion devices	High
Corner of Wood St and Hatherley Ave		• Sign to Hawthorn & Westbourne Park	New signage strategy required	High

• **Corner of Northgate St and Victoria Ave**		• Right turn into Victoria Ave across high volume traffic volumes in Northgate St	• Install cyclist refuge • Install bicycle lanes in section of Northgate Street	High
• **Victoria Ave**		• Bus route • High volumes of traffic – separation required • Debris on street	• Review route and either install bicycle lanes in Victoria Avenue or choose an alternative route • Review maintenance program and remove tree debris more regularly	High
• Victoria Ave		• No space for cyclists near Cross Rd	• See notes above	High

Route: Duthy Street

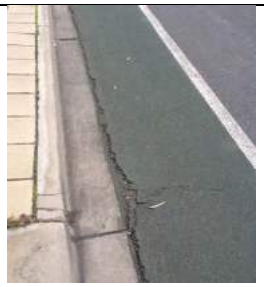


Duthy Street is a direct north-south collector route for motor vehicles (including buses), and cyclists. The speed limit is 50km/h and the traffic volumes are in the order of 12,000 vehicles per day. Bicycle Car Parking Lanes exist but there is scope to improve this facility by strengthening the separation of cyclists with buffer zones between car door opening and also moving traffic, as well as green coloured pavement at busy road junctions.

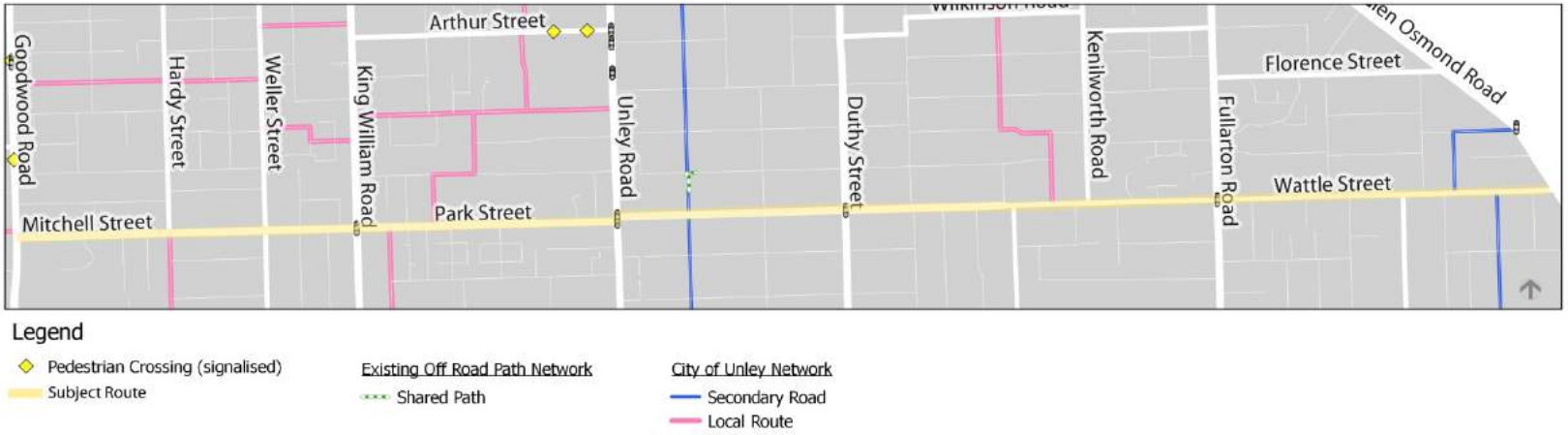
The site inspection photographs, comments and recommendations are listed below.

Location	Photo	Deficiency	Action	Ranking
Duthy Street bicycle lanes - general		• Bicycle lanes installed to basic standard only	• Reallocate lanes to include buffer zones and increase separation	Medium (next time linemarking is programmed)
Duthy Street bicycle lanes at busy road junctions and other hazardous locations (eg, traffic crossing to auxiliary lanes)		• Potentially hazardous for cyclists due to vehicles crossing cycle lane	• Install green coloured sections of road pavement at busy road junctions	High
Between Cross Road and Malvern Avenue		• See above	• See above	
Near corner of Eton St		• Note transition from exclusive bicycle lane to bicycle car parking lane • Faded bicycle logo	• Re-mark logos at locations where vehicle traffic causes additional wear	High

Entire length		• No buffer between car doors opening and bicycle lane	• Install chevron linemarked buffer zone between car parks and bike lane	High
Duthy / George Street bend		• One-way bicycle path around bend – safer alternative that on-road • Logos are worn and faded (several locations)	• Re-mark bicycle logos where required	Medium
		• Horizontal cracking and lifting of path	• Assess surface and repair cracking where required	High
		• Horizontal cracking and lifting of path	• Assess surface and repair cracking where required	High

		• Uneven surface, cracking and edge deterioration	• Repair cracking	Medium
George St / Maud St		• Edge deterioration	• Assess and Repair	High

Route: Wattle Street /Park Street /Mitchell Street



This route is a direct east-west route between Glen Osmond Road and Goodwood Road and ideally located for cross-city commuting. The high traffic volumes (upto 7,000) and speeds (upto 54km/h toward Glen Osmond Road) require separation between cyclists and traffic. As there is insufficient carriageway width to fit bicycle lanes as well as keep the existing on-street parking, cyclists are squeezed between car doors opening and moving traffic.

In the long term, when the road is due for reconstruction and the trees are near the end of their life, a full-street street-scaping design that includes cycling is recommended. Until that time, an interim concept is required that gains more space for cyclists.

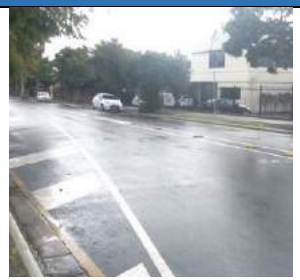
There are some busy retail/commercial driveways along the route where there could be potential conflict between vehicles turning in and straight-through riders. These driveways require attention to reduce potential conflict. When formal bicycle lanes are installed, green coloured sections are recommended at these locations.

The roundabout at the intersection of Wattle Street and Cambridge Street has experienced 1 cyclist collision per year for the last 5 years and it is recommended that the roundabout be modified to a radial design instead of a tangential design.

Traffic is calmed along Park Street (west of Cambridge Street) and all of Mitchell Street with road humps, which are successfully moderating the traffic speed to around 40km/h.

Mitchell Street carries 5,500 vehicles per day and terminates at the hazardous junction of Goodwood Road, with no safe crossing facility. Therefore, an alternative route is put forward that directs east-west cyclists to Angus Street, via Weller Street. Angus Street is located close to a PAC on Goodwood Road and a short section of shared path on the Goodwood Road footpath would facilitate safe access to this crossing. Furthermore, this route could be extended with a section of shared path on the west side of Goodwood Road to link safely to Victoria Street and on to the Marino Rocks Greenway or the Mike Turtur Bikeway. Refer to Cycling and Walking Plan for this alternative route concept.

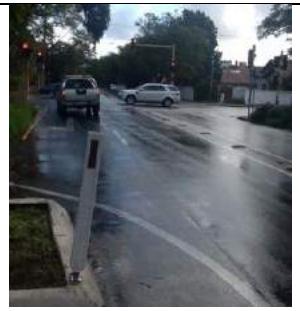
The site inspection photographs, comments and recommendations are listed below.

Location	Photo	Deficiency	Action	Ranking
Wattle St, Between Glen Osmond and Fullarton Road		• Entry from Glen Osmond Road – wide entry to squeeze point marked with chevron marking •	• Assess if bicycle lane can replace chevron	medium
		• Protuberances at junctions • Easy to speed (motor car).		
		• Edge line is 3.1 to 3.5m from kerb provides wide parking lane and some space for cyclists. (but not wide enough to comply with Standards for Bicycle/Car Parking Lane).	• Low to medium parking demand, and every house has a driveway – consider removal of carparking on one side of road to find room for bicycle lanes.	High

		• Location of trees varies and forms narrower squeeze points for cyclists • Cyclists ride close to vehicles and car dooring potential • Bollards need review. • Trees in road / Parking bay	• Refer to Cycling and Walking Plan for Staggered Parking Concept	
		• Bike logos at junctions only • BikeDirect signs (redundant) still exist	• Redesign required that provides bike lanes along whole length • Remove BikeDirect signage	High
Various locations		• Debris from trees	• Identify cycling routes with trees that drop debris and increase maintenance schedule.	High
		• Regulatory sign location inconsistent and not always to Standard. • Eg, Bike Lane sign installed for short section approach to Fullarton rd , with bike lane end sign 40m further on.	• Review signage as part of whole of street re-design for cycle lanes	High

		• Space for cyclists removed totally at intersections with collector and arterial roads	• Review as part of whole of street re-design for cycle lanes	High
Wattle St, Fullarton Rd intersection		• Note bicycle buttons exist – no deficiency just noted	• Review road section as part of whole of street re-design for cycle lanes	
Wattle St, between Fullarton Rd and Duthy St		• logos mid-block	• Review as part of whole of street re-design for cycle lanes	

		• Bike lane sign on approach to Fullarton rd • no bike lane end signs	• Review as part of whole of street re-design for cycle lanes	
		• Squeeze points at some trees	• Review as part of whole of street re-design for cycle lanes	
		• Logo quality varies	• Review as part of whole of street re-design for cycle lanes	

		• Protuberances at junctions vary.	Review as part of whole of street re-design for cycle lanes	
		• Squeeze point at Duthy St	Review as part of whole of street re-design for cycle lanes	
Wattle St, between Duthy St and Unley Rd		• Roundabouts – potentially hazardous	• Modify roundabouts to radial design	Medium

		• Speed plateaus (Cambridge to Unley) across full width between protuberances. Noted only.		
		• Bike buttons at Unley rd signals – noted only		
Park Tce, Unley Rd to King William		• Cyclist squeeze points where auxillary turn lanes created	Review as part of whole of street re-design for cycle lanes	

		• Drive Way's into busy rear car parks - crossing cyclist path	During design review consider green coloured bicycle lanes at these conflict areas	
		• High car parking demand	Review as part of whole of street re-design for cycle lanes – some on-street parking may be required for removal	
		• No lanes or bike buttons at KW rd signals.	Install bicycle buttons is	Medium

Route: Marino Rocks Greenway

The Marino Rocks Greenway has recently been completed by DPTI. The route runs along the Seaford rail line from the corner of Cross Road and South Road to the corner of Anzac Highway and Greenhill Road (within the City of Unley). Further afield it extends to the Coast and Vines Trail at Marino Rocks (via a shared path on the Cross Road eastern footpath that links to a cyclist/pedestrian underpass of Cross Road (under the vehicle overpass)), to the CBD via the Anzac Highway underpass and the West Terrace Shared Path. The route follows low-traffic streets and/or shared paths. It is an enjoyable cycling route and provides direct access to Stations and the Keswick Route (previously constructed by Council). It is noted that DPTI are currently planning a major upgrade at Goodwood Station that is likely to include grade-separated cyclist crossing.

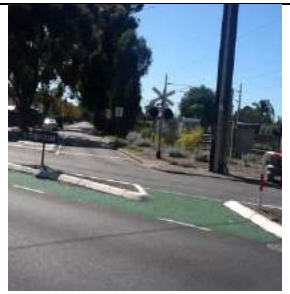
The site inspection photographs, comments and recommendations are listed below.

Location	Photo	Deficiency	Action	Ranking
Near Emerson Train Station		• Typical wayfinding signage (noted only)		
South Road		• Shared path on South Road footpath. Showing appropriate approach line marking and signage to a stobie pole hazard (noted only)		
Access to/from Emerson Rd		• Bollard – no approach linmarking from either direction • Bollard is a potential hazard	• Install approach linemaring - DPTI have been alerted and are reviewing all bollards along route. Liaise with DPTI on progress. (Applies along entire length of Greenway)	High

Shared path – between Emerson Road and Gordon Rd.		• Light obscured by trees	• Cut back foliage to expose light. • Increase maintanence schedule as required • Applies to entire length of shared path	High
Shared path at access to/from Cowper Rd		• Approach line-marking to bollard not to Standard. • Bollard is a potential hazard.	• Install approach linemaring - DPTI have been alerted and are reviewing all bollards along route. Liaise with DPTI on progress. • Applies along entire length of Greenway	High
Solid fence alongside shared path		• Example photo of solid fences that restrict passive surveillance along shared path	• Encourage visually permeable fencing where possible along shared paths	ongoing

Fence alongside Princess Margaret Playground		Example of visually permeable fencing (noted only)	• See above	
Access to path to/from Canterbury Tce		• No approach linemarking at bollard	• Install approach linemarking (liaise with DPTI)	High
Access from Canterbury Tce to Shared Path		• Cyclists cross pavement bars – potential hazard	• Review design of pavement bar island and remove pavement bar at cyclist crossing location	high

Access to/from Addison Road/Canterbury Tce		• Bollard line-marking not to Standard	Install approach linemarking - DPTI have been alerted and are reviewing all bollards along route. Liaise with DPTI on progress. • Applies along entire length of Greenway	High
Exit from path to Addison Road/Canterbury Tce		• Line of trees restrict sight distance to oncoming vehicles	• Reduce traffic speed	medium
Path – between Addison Road and Fairmont Avenue		• Redundant BikeDirect sign	• Remove all BikeDirect signage	Medium

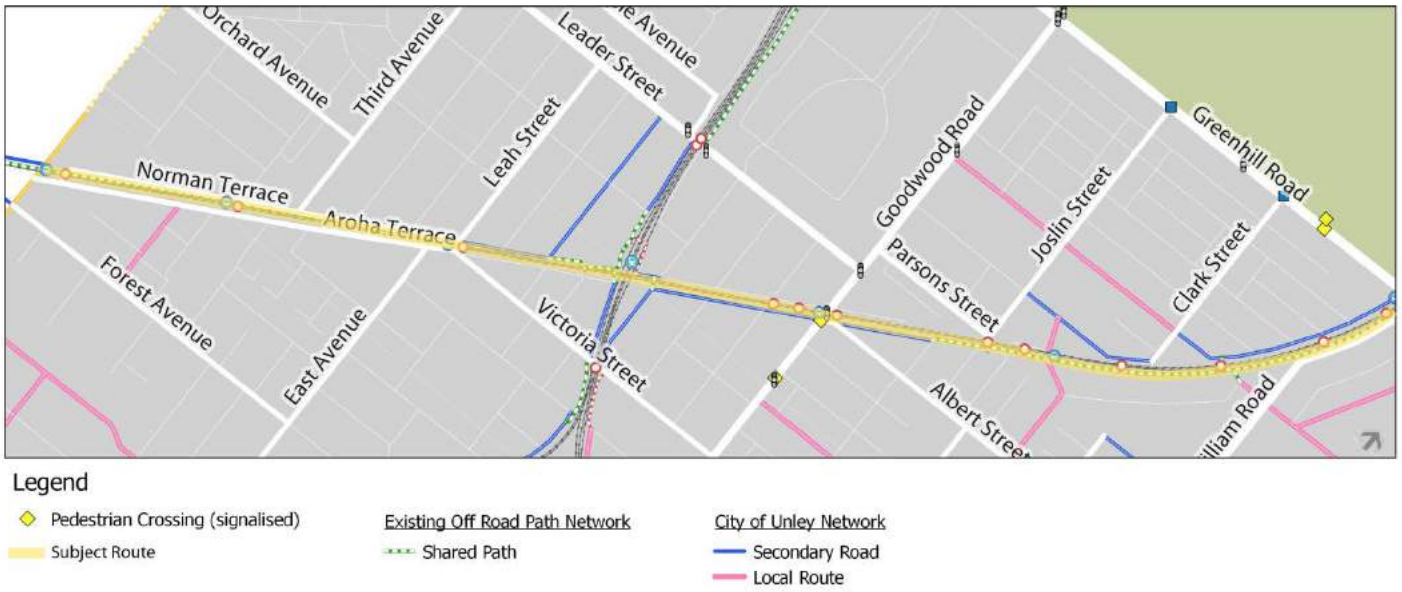
Near East Ave		• City direction on bottom does not have a straight-ahead arrow (has been drawn in by a cyclist – and distance also changed from 5.2 to 4.5km). • Straight ahead arrows do not appear consistently. Although done on purpose, it appears that is does not make for clear wayfinding	• Alert DPTI to lack of clear wayfinding on signage • Consider adding arrows to signage	medium
Greenway / East Terrace intersection		• Cyclist crossing at East Terrace (noted only)		
Cromer Pde / Chelmsford Ave		• Poor sight distance around bend in road.	• Install pavement bars to track cars around bend instead of corner cutting	High

Victoria Street crossing		• Noted only. Cyclists are able to cross Victoria Street when train signals are flashing and vehicles held at stop line		
Goodwood Station		• Rail underpass crossing with lack of passive surveillance • Poor sight lines around bends	• DPTI currently planning major upgrade of this area – work with DPTI to ensure best practice cycling facilities are included. EG Cyclist overpass.	
Lyons Parade		• Sharrows exist – noted only		

		• Wayfinding signage – noted only		
Entry from Nairne Tce		• No approach line-marking to/from bollards	Install approach linemarking - DPTI have been alerted and are reviewing all bollards along route. Liaise with DPTI on progress. • Applies along entire length of Greenway	
Richards Terrace / Leader St / path intersection		• Role of Richards Terrace not defined, but provides access for nearby residents	• Clarify if Richards Tce part of route or should cyclists use Nairne Terrace ? • Consider bicycle logos on Richards Terrace	Medium

Greenhill Road Underpass		• Noted only. Connects to West Terrace Shared Path (ACC) under Greenhill Rd/Anzac Hwy		

Route: Mike Turtur Bikeway



The Mike Turtur Bikeway is the busiest bikeway in Adelaide, with the Super Tuesday survey counting 660 cyclists between 7-9am at the Greenhill Road / King William Road crossing point. Although this is an excellent low-traffic and shared path route, there are some deficiencies such as missing links and poor pavement surface in some areas. The critical missing link is at the crossing of the Seaford Rail Line (also the Marino Rocks Greenway), where cyclists are required to travel anti-directionally to Victoria Street or dismount and walk through the aged, narrow rail underpass. This deficiency is currently being addressed by DPTI as part of the Rail Revitalisation Project and options are being evaluated to provide an overpass for cyclists. There are several deficiencies at the access to and from the bikeway near Greenhill Road which are also addressed below.
The site inspection photographs, comments and recommendations are listed below.

Location	Photo	Deficiency	Action	Ranking
Shared path termination 120m south of Greenhill Road		1. Northbound: Shared Path ends where bike lanes start. Cyclists are forced out to a narrow cycle lane between through lane and left-turn lane (eg vehicles cross bike lane to access left turn lane) 2. Southbound: Bicycle lane squeezed between parked cars and 2 x lanes of moving traffic	1. Extend Shared Path to Greenhill Rd and liaise wth DPTI regarding cyclist crossing to shared path on north side of Greenhill Rd. This will also allow southbound cyclists to access SP at Greenhill Rd signals instead of riding along KW Rd to median refuge & crossing to SP 2. Review need for parking along this section of KW Rd – remove parking and repace with buffered bicycle lane	High
		• Kerbside cyclist refuge to wait for cars to pass before entering median refuge. Linemarking faded.	• Review design for possible improvement and re-mark kerbside refuge	High

Access to shared path from Young Street		• Narrow, overgrown, dim-lit access to shared path from Young Street. Restricted sight distance due to boundary fences. 'Watch for Pedestrians' sign aims to alert cyclists of potential conflict. Bike route sign installed too high to be clearly visible.	• Assess for upgraded lighting without spill to adjacent dwellings and regularly trim foliage to keep lighting clear. Re-install bike route sign at lower height. Install additional Watch for Pedestrians sign close to junction with shared path.	Medium
Near Wayville Tram Stop		• Poor pavement surface caused by tree roots and wear & tear	• Review length of shared path north of Musgrave Street and replace/repair pavers where required to provide smooth riding surface	High
Bendall Ave access to/from shared path		• Steep, narrow ramp with poor quality hand rail and uneven surface • Post at bottom of ramp poorly located and a potential hazard – and may not be visible in low light conditions	• Upgrade path with new handrail, signage and resurface • Attach reflective tape to post in the short-term until upgrade completed	Medium

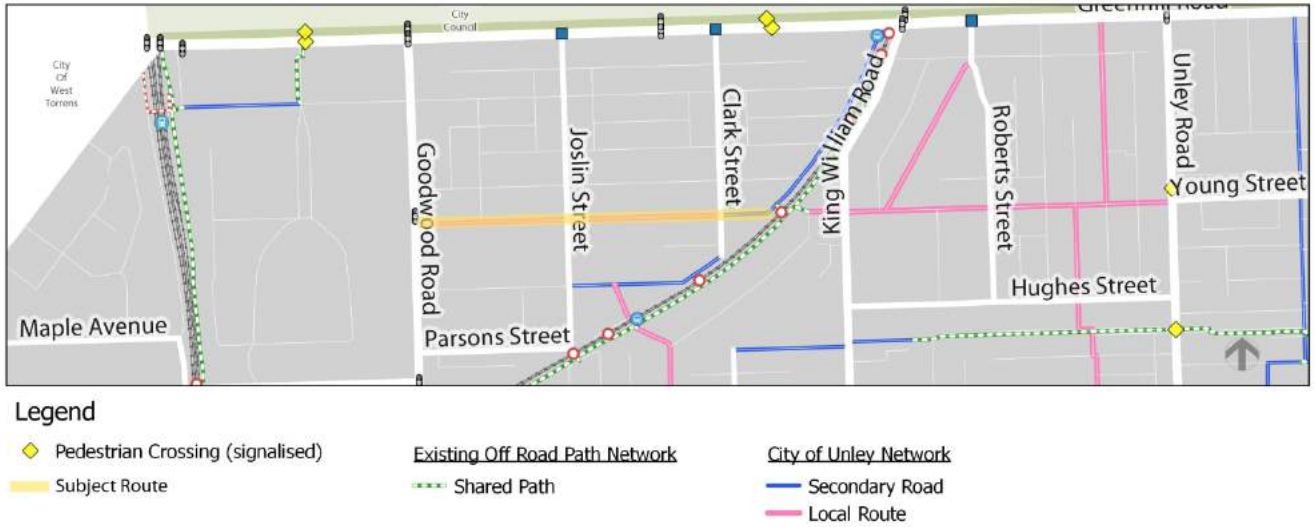
				
North of Musgrave St		• Narrow path, overgrown in places and debris on path • Poor pavement surface caused by tree roots and wear & tear	• Regularly maintain to remove debris and overgrown foliage - as path is narrow, this is critical • Review length of shared path north of Musgrave Street and replace/repair pavers where required to provide smooth riding surface	High
West of Goodwood Rd intersection		• Worn pavement marking and sharrows	• Re-mark sharrows on a regular basis	Ongoing

Railway Tce, just west of Goodwood Road		• Deep pothole in road where cyclists position themselves – visibility is exacerbated due to shadows	• Repair Pothole	High
Near Goodwood Station		• DPTI signage points to 2 x different routes to City but does not clarify which part of the city – therefore cyclists do not know which route to take for their destination	• Discuss the need for more information on these signs to assist wayfinding	Low
Goodwood Station Underpass		• Underpass is poorly designed with restricted sight distance, and lack of passive surveillance • Cyclists are required to dismount	• Continue to liaise with DPTI regarding the Rail Revitalisation Project and cyclist overpass	High

Norman Tce / Forestville Reserve		• Wayfinding signage poor – do not know to ride through car park • Redundant bike direct sign directs cyclists onto road • Poor sight distance around bend	• Review of entire area around Goodwood Station – currently underway by DPTI as part of the rail revitalisation project. • Continue to liaise with DPTI regarding progress	High
Norman Street, between Leah St and Ethel St		• No shared path in this location, cyclists use Norman St. High parking demand reduces road width and space for cyclists (2-way road)	• Review Norman Street with view to streetscaping (remove parking and incorporate Shared Space or Shared Zone as per LATM)	High
Leah St		• Queuing cars at train line block cyclists path across Leah Street	• Review this crossing and determine the need for a Pedestrian Actuated Crossing	High

Shared path, near Second Avenue		• Overhanging foliage within cyclist envelope	• Review maintenance program	high
South Road Intersection	 	• Cyclist overpass is provided alongside tram line to cross South Road. This is an excellent facility as pedestrian fencing along South Road prohibits at-grade crossing. However, there is a lack of signage to make cyclists and pedestrians aware of this facility	• Install signage to assist wayfinding to the overpass	High

Route: Young Street



The Young Street route connects the Mike Turtur Path to Goodwood Road. It is an important link to the Adelaide Showgrounds which is a significant cyclist generator. There are no bicycle lanes, pavement logos or cycling signage along this route and safe crossing facilities are not provided at all major road crossings. There is a Pedestrian Actuated Crossing (PAC) to assist crossing of Goodwood Road located 20 metres to the north of Young Street. Traffic speed (85th percentile) was recorded at around 50km/h even though the speed limit is 40km/h and traffic calming (roundabouts and road hump) exist. Note that roundabouts are at around 300m intervals, and there is a single road humps just east of Clark St. Traffic volumes are relatively low at less than 1000 vehicles per day.

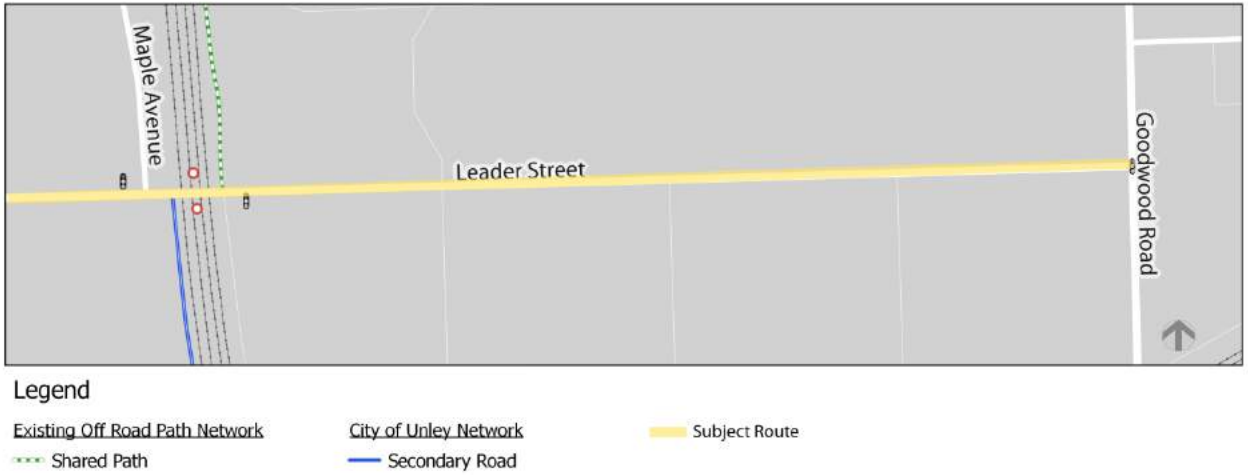
The site inspection photographs, comments and recommendations are listed below.

Location	Photo	Deficiency	Action	Ranking
Goodwood Road, Young Street to PAC		• Access from Young Street to PAC (located 20m north of Young Street) is against traffic flow	• Convert eastern footpath to a Shared Path connection from Young St to PAC. • Provide median refuge in Young Street to assist with crossing to this SP	High
• **Goodwood Road opposite Young Street – west side (to Leader St)**		• Footpath on Western side of Goodwood Road between Young Street and Leader St	• Shared path link can be extended from PAC along western footpath of Goodwood Road to link Leader Street traffic signals	High
Joslin Street junction		• Roundabout exists. New median refuge has been installed at Greenhill Road / Joslin Street – good connection to Park Lands. Cyclists ride between parked cars (potential dooring conflict) and moving traffic	• Joslin Street is earmarked for new streetscape design – support this and ensure that cyclist space and traffic calming is incorporated	Medium

Between Clark St and Bartley Tce		• Single road hump exists 30m west of bend in road at tram line	• Consider installing a series of road humps to reduce traffic speed along rest of Young St	Medium
Access to Mike Turtur Bikeway		• Bikeway is on east side of tram line and cyclists are required to dismount to cross. • Access ramp off of Young St/ Bartley junction is in poor condition and narrow. It has a central holding rail which could be a potential hazard	• Upgrade access and remove holding rail or replace rail on one side of the ramp	Medium
Crossings at Unley Rd and King William Rd		• Unley Road crossing difficult. PAC located too far away and access via footpath is not possible due to high pedestrian activity and outdoor dining • King William Road difficult to cross	• Liaise with DPTI to move PAC to Young Street intersection • Install cyclist refuge at King William Rd / Young St	Medium

Crossing at George ST		• No kerb ramps to cross George St	• Install kerb ramps	Medium

Route: Leader Street

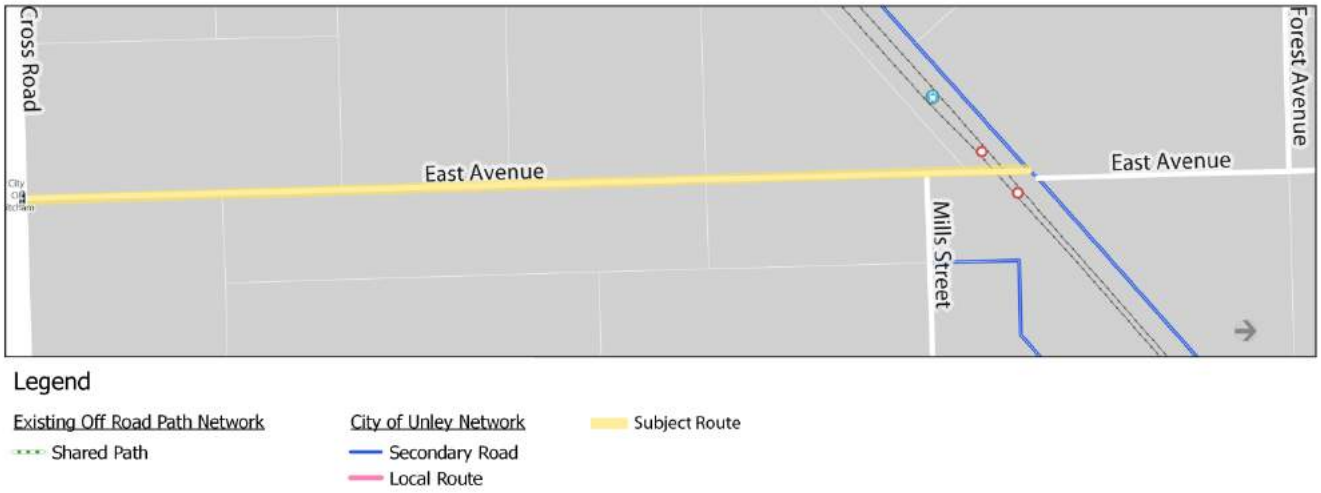


Leader Street is a key east west Collector route (50km/h) and bus route between Anzac Highway and Goodwood Road, linking to the Adelaide Showgrounds, Marino Rocks Trail and, over Goodwood Road to Young Street. Concept plans have recently been prepared for bicycle lanes between Anzac Highway and the Marino Rocks Greenway, where no lanes currently exist. This site inspection comprises the section where existing bicycle lanes run between the Marino Rocks Greenway and Goodwood Road. This section of road carries around 9,000 vehicles per day and the 85th percentile speed was recorded at 49km/h. This environment requires that cyclists be separated from traffic. There are 1.4m wide Exclusive Bicycle Lanes (EBL's) on the north side and 3.7m wide Bicycle Car Parking Lanes (BCPL's) on the south side, with one lane of traffic in each direction (3.5m each). There is sufficient road width to provide better separation for cyclists by reducing traffic lane widths and providing a buffer zone between vehicles and bicycles. This road dieting may also have a minor traffic calming effect.

The site inspection photographs, comments and recommendations are listed below.

Location	Photo	Deficiency	Action	Ranking
Leader St / Seaford Rail Line (westbound)		• Parallel bicycle lanes across rail crossing line-marking is confusing (note: left lane includes left turn arrow into Nairne Terrace)	• Re-design this section of bicycle lane. Consider 1 x wide bicycle lane with buffer between moving vehicles	High
Leader St - general		• Bicycle Car Parking Lanes minimum width – cyclists squeezed between parked cars and traffic	• Reallocate lane space to reduce traffic lane width and provide buffer to cyclists	High
		• Bicycle lanes terminate 50 before Goodwood Road - squeeze point • Sightlines and signage issues at Leader St/Train line / Tram line	• Redesign to extend bike lanes's to Goodwood rd. • Undertake review of existing lanes for signage and sightlines	High

Route: East Ave



East Avenue is a north-south Collector Route and bus route between Cross Road and the tram line at Leah Street. The Marino Rocks Greenway run across East Avenue at its mid-point. Bicycle Car Parking Lanes exist south of the Greenway, but north of the Greenway there is insufficient road width for bicycle lanes as well as car parking. This site inspection reviews the existing bicycle lanes between Cross Road and the Greenway. This section carries 12,000 vehicles per day and therefore, cyclist separation is critical.

The site inspection photographs, comments and recommendations are listed below.

Location	Photo	Deficiency	Action	Ranking
		• Busy road with heavy vehicles – not a pleasant cycling route • Bicycle lanes are narrow	Noted only	
Just north of Cross Road		• Bicycle lanes are narrow	• Review design to reallocate traffic lane widths to provide buffer zone separation to cyclists	High
Just north of Cross Road		• 2 x signs mounted on one post and top sign overlaps Bicycle Lane sign	• Relocated Neighbourhood Watch sign to another post	High
North of Cross Road		• Direction sign mounted too high to read by cyclist	• Reposition sign	High

Sporadic locations		• Debris in bicycle path reduces its width	• Increase maintenance of bicycle routes	High
		• Damaged sign. End sign bent and Bicycle Lane sign facing wrong direction	• Repair sign	High
Just north of Cross Road (east side)		• Construction vehicle parked in bike lane.	• Increase policing of illegal parking	High

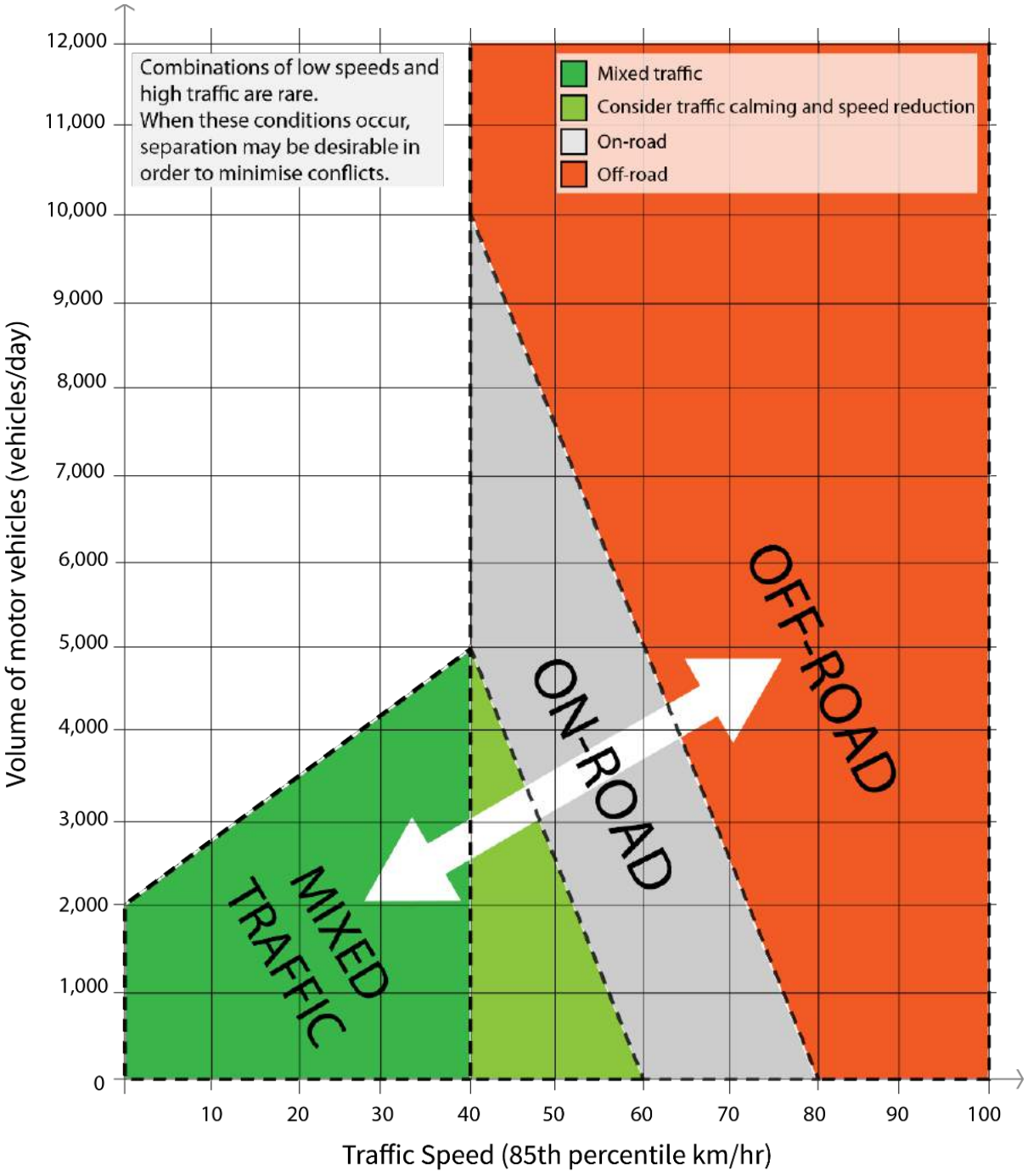
Between Cross Road and Langdon Ave		• Vehicles parked in bike lane	• Increase policing of illegal parking	High
Several Junctions		• Green coloured bicycle lane recently installed (noted only)	• This action is supported	Ongoing
Mills St intersection		• Bicycle lane terminates suddenly prior to Mills St on east side • Potentially hazard crossing from Mills St	• Redesign to extend bicycle lane to Greenway. • Consider removal of car parking in front of shops • Install median crossing at Mills St	High

South of rail line		• Bicycle Lane End sign exists but lane continues for additional 80 metres	• Relocate sign	Low
East Terrace / Greenway		• Poor wayfinding for northbound cyclists	• Install signage to encourage cyclists to use Marino Rocks Greenway instead of continuing north along East Terrace where there are no bicycle lanes	High

Appendix D: Design Toolkit: Cyclist Infrastructure and Shared Paths

Design Toolkit: Cycling Infrastructure & Shared Paths

The design toolkit presents a collection of best practice design elements and treatments that vary in suitability determined by site specific conditions and contexts. They have been categorised into subgroups as follows: 'General', 'End and Mid Trip Facilities', 'Paths', 'On-Road' and 'Road Crossings'. The graph below is a useful tool in identifying whether best practice on a particular street is mixed traffic, on-road lanes or off-road paths and is to be read in conjunction with this design toolkit. Each treatment has limitations, and InfraPlan reiterates the need to conduct site specific analysis to ensure the best practice and cost effective measures are undertaken.



Note: This diagram is to be applied to urban roads and is not appropriate for rural or non-urban roads.

Original matrix produced by Austroads, adapted by InfraPlan.

General (A)

Design Toolkit No. A1: Neighbourhood Streets

The Streets for People Compendium is a valuable resource for Council when developing cycling and walking neighbourhoods, particularly when aiming for reduced speeds. Best practice design builds speed restraint into the design of the street and creates a lower speed environment[1]. However in existing streets, traditional retrofitting of traffic calming devices are usually required.

Key principles for reducing vehicle speeds along a street include:

- reducing lengths of straight road sections;
- narrowing road width to create slow points;
- limiting forward sight lines and driver's field of vision by incorporating landscaping;
- introducing bends (a meandering street), horizontal deflection, at intervals less than 80 metres;
- vertical deflection (road humps or speed cushions), 40 to 70 metres apart;
- change in pavement texture (paving at junctions or other materials that have audio-tactile properties for motor vehicles, but do not impact on cyclists); and
- visual elements such as landscaping, signage and streetscape changes.

Traditionally, traffic calming devices such as slow points, road humps and roundabouts have been placed at 80-120 metres apart. This usually reduces vehicle speeds to 20 km/h at each device, but allows vehicles to speed up in between. Best practice design maintains consistently slow speeds throughout the length of the street (less than 30km/h). To achieve this, the devices need to be placed at less than 80 metres apart (40 to 70 metres desirable).

The installation of traffic islands and slow points will usually result in the loss of some car parking.

Reduced lane widths should be less than 3 metres wide, so that a vehicle must overtake by indicating and entering the other side of the road, but not squeezing past the cyclist within the lane.

Speed reduction treatments can also reduce traffic volume as they can make arterial roads more attractive to cut-through traffic. Other ways to reduce volume include half-road or full-road closures, banning of some turns and junction rearrangement.

[1]See 'Safe Speed Environments', Streets for People Compendium 2012, Chapter: C4, pp. 10-11.

Examples of streets with slow speeds are shown below (note: Photo 2 to Photo 6 are taken from the Streets For People Compendium). The selection of a particular speed reduction device will vary depending on the existing street environment.

Photo 1: Road narrowing with median, Adelaide.

Photo 2: Meandering street, Unley.

Photo 3: Shared Space, Adelaide.

Photo 4: Textured pavement at junction, Mawson Lakes.

Photo 5: Painted junction, Bowden.

Photo 6: Varied pavement sections, Canberra.

Photo 7: Landscaping in roadway.

Photo 8: Slow Point (typical).

Photo 9: Speed Cushions / Road Humps.

Design Toolkit No. A2: Local Speed Precincts

Implementation of precincts with 40km/h speed limits requires specific approval by DPTI. Approval is based upon the area meeting specific criteria for mean speeds of traffic on most of the roads in the area, as well as demonstrated community support for a lower speed limit.

Photo 10: 40km area precinct, King William Road, Hyde Park.

Design Toolkit No. A3: Shared Zones

A Shared Zone is a legal traffic control device in South Australia. It is similar to Shared Space in that there is not a traditional roadway-footpath distinction, and pedestrians have equal rights with vehicles. However, Shared Zones must be designed to specific guidelines that force traffic to travel at walking pace speed, and include a 10 km/h speed limit. Existing Shared Zones in the Adelaide CBD are: Festival Drive, Peel St, Stock Exchange Lane, Charlick Circuit and Freemasons Lane.

Photo 11: Charlick Court, Adelaide.

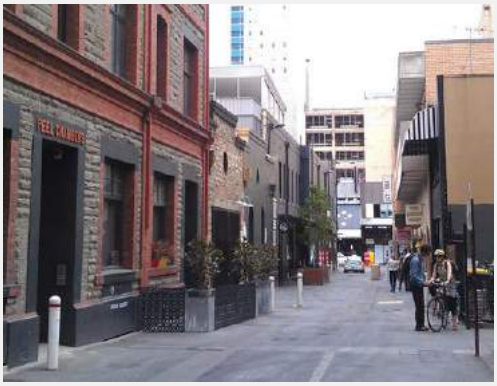


Photo 12: Peel Street, Adelaide.

- Shared Zones must be signed and designed for 10km/h.
- Parking is not recommended in the Design Guidelines.
- Opportunities for Water Sensitive Urban Design opportunities.

Design Toolkit No. A4: Shared Space

The term, 'Shared Space' is an urban design and traffic engineering concept developed in the Netherlands that integrates pedestrians, cyclists and vehicles in a slow environment. All traditional street elements such as kerbs, signs, traffic lights and pavement markings are removed, and the surface is made of block pavers to look and feel different to a road. These elements create an ambiguity that results in people acting more cautiously on the road.

Survey data of overseas examples has shown that there are benefits such as lower vehicle speeds, reduced congestion, fewer accidents and injuries, and more vibrant and attractive streets. However concerns have been raised about the negative effects that shared space has on more vulnerable road users such as children, the elderly and people with a visual impairment. In New Zealand, safe routes within Shared Spaces have been designed in cooperation with disability organisations to include vehicle- and obstruction free corridors (accessible zones) along the building lines.

The 'Streets for People Compendium' includes more detail on ways to design shared streets in South Australia has been produced through extensive research and consultation.

Photo 13: Shared space, Haslach, Germany.

Photo 14: Shared space, Barrack Street, Sydney.

- Incorporate with design advice from disability groups.
- Consider on-street parking and loading zones.
- Opportunities for outdoor dining.

Design Toolkit No. A5: Signage / Way Finding

Directional signage helps to assist people in finding their way without referring to a map. Once a continuous route has been established, signage can be useful to guide and inform people of distances and estimated travel times to common or interesting destinations, such as rail stations, activity centres, cycling trails, transport interchanges, educational campuses etc. Ideally the use of signs should be minimised to reduce visual clutter and installation costs. Pavement logos can also assist continuity along a route and consistency for ease of use.

Photo 15: Simple directional signage, Goodwood, SA.

Photo 16: Directional signage with distances and estimated travel times, Marion, SA.

Photo 17: Direction signage with specific destinations and distances, Melbourne, Vic.

Design Toolkit No. A6: Shared Path Etiquette

As the number of shared paths grows, so does the conflict potential for cyclists and pedestrians. According to the Australian Road Rules (Regulation 242), cyclists on a shared path are obliged to keep left and give way to pedestrians, which means slowing or if necessary stopping to avoid a collision. Not as well known, but equally as important is that pedestrians are also obliged not to unreasonably obstruct other users (Regulation 236). This means they should also keep left, not stop in the middle of a path and ensure children, strollers and dogs etc. are controlled appropriately. Mutual cooperation and respect should allow all users to move safely and freely along shared paths. As an example, the City of Sydney (2014) has produced a collection of safety tips as follows:

- **When Riding**
  - **Give Way** - Always give way to pedestrians; they have right of way.
  - **Ring Your Bell** - Ring your bell early to alert walkers of your presence.
  - **Slow Down** - Slow down and be courteous to pedestrians.
  - **Watch Out** - Pets and children can be unpredictable, always take extra care on shared paths when they are present.
- **When Walking**
  - **Be Aware** - Be aware of other users and try not to listen to your iPod in shared path environments as it might stop you from hearing a bike bell.
  - **Listen for the Bell** - If you hear a bike bell on a shared path, move to the left hand side in a safe fashion and allow the bike rider to pass.
  - **Be Predictable** - Keep to the left on shared paths and walk in a predictable manner.
  - **Be Considerate** - Keep pets under control and ensure children are supervised on shared paths.

End and Mid Trip Facilities (B)

It is critical that appropriate end-trip facilities are provided at destinations, such as attractors, activity hubs and public transport interchanges, and mid-trip facilities be provided where deemed suitable, such as along busy cycling routes.

It should be noted that the provision of bike parking at major transport stops and interchanges is important in encouraging change in travel behaviour. Undercover and secure lock up facilities at these locations is becoming international best practice.

Key facilities and typical locations for installation are summarised below and described throughout this section in detail.

• Location	• End-trip/mid-trip facility				
	Bicycle Parking (B1)	Bicycle Adjustment/ Repair Stations (B2)	Seating (B3)	Other Facilities (B4)	
				Drinking Fountains	Toilets
Green Trails	At picnic grounds, toilets, play-spaces	At key points as required	At 100m intervals (max), recreational hubs and locations with views	At entry points	At key points as required
Laneway	At retail/commercial destinations	n/a	n/a	n/a	n/a
Residential street	n/a	If required	At 400m intervals	n/a	n/a
Collector/ distributor	At retail/commercial destinations	If required	At 400m intervals	If required	n/a
Arterial road	At retail/commercial destinations	If required	At 400m intervals (max)	Where required	n/a
Activity centres/hubs	At convenient locations	If required	Multiple	Where required	As required

Design Toolkit No. B1: Bicycle Parking

Parking for cyclists is particularly important and should be located in an intuitive, easy to find location. Short-term parking for visitors is usually in the form of rails located in an area of passive surveillance, and close to the entry point of destinations. Long-term parking is also required for employees and all-day parkers. These require a location that is highly secure (usually enclosed), and protected from the weather (undercover).

It is obvious that some destinations require parking rails as they will automatically attract cyclists, such as parks, swimming pools and along shopping strips. However, all businesses should be able to apply to Council for rails to be installed if the demand exists. This not only encourages cycling, but also stops footpath clutter with bikes parked against posts and fencing (which can also cause property damage). Bicycle parking should comply with Australian Standards AS 2890.3 – 1993 Part 3: Bicycle Parking Facilities.

Enclosed parking facilities at transport interchanges encourage integrating active transport in to longer journeys by enabling people to secure their bikes before moving to public transport. Secure parking cages are currently being installed by DPTI at some of Adelaide's most popular train stations.

Bicycle pods can incorporate showers, personal lockers and secure bicycle parking and are designed to fit within existing car parking bays in varying configurations. These are suited to existing undercover car parks and are used by staff who require all–day secure parking. The showers and lockers can encourage staff who live long distances away and cycle to work at buildings that do not already have these facilities.

Photo 18: Bicycle parking rails (short-term parking)

Photo 19: Bicycle cage, Leeds UK (secure parking)

Photo 20: Typical bicycle pod (parking and additional facilities)

Design Toolkit No. B2: Bicycle Repair and Adjustment Stations

As the number of commuter riders and general cyclists increases, there is a growing need for a facility where temporary bicycle maintenance, repairs or adjustments can be undertaken. Bicycle adjustment or repair stations can be easily installed into end of journey facilities such as bicycle cages or at strategic locations along busier cycling routes. The station allows for a bicycle to be positioned on it so that repair work can be easily undertaken and generally comprises a manual bicycle tyre pump as well as tools that a cyclist would likely require that are attached by stainless steel tethering ropes.

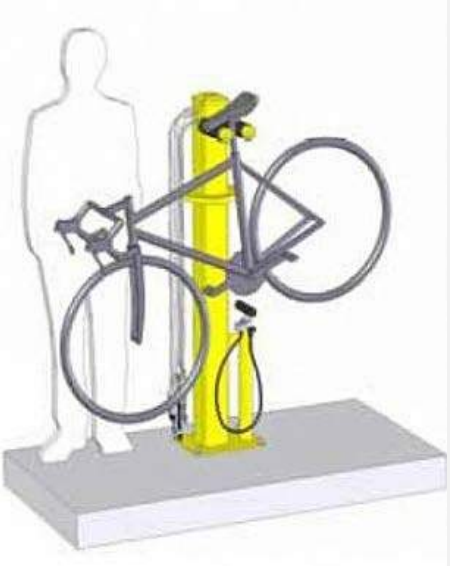


Photo 21: Typical bicycle repair/adjustment station design.

Photo 22: Bicycle repair station, Adelaide University Campus.

Design Toolkit No. B3: Seating

Resting is an integral component of active transport, especially for people who are starting out to improve their fitness, the elderly and people with a disability. Seating can be used to create opportunities to rest, enjoy a landscape or view, and interact with others and should be placed at frequent intervals, particularly along shared paths. A lack of seating can discourage people who are less fit and need to stop frequently to rest when moving between locations.

It is recommended that:

- seating be provided at maximum intervals of 400 metres on routes on the pedestrian network, more frequent along the Green trails and at key sites;
- seating (in multiples) be provided at 'destinations', such as the local shops to encourage social contact;
- seating should be positioned where people would want to sit, most commonly a well-lit place, with good sightlines, away from sources of noise and air pollution;
- seating to be set back from the footway, so as not to cause an obstruction or impede the clear footway; and
- there should be space for a wheelchair/mobility scooter to user to pull up alongside a seated companion.

Photo 23: Seating examples.

Design Toolkit No. B4: Other Facilities

Other facilities to be considered to improve amenity for cyclists include:

- drinking fountains at entry points to trails and other key locations; and
- toilets at key locations.

Paths (Off-Road) (P)

Design Toolkit No. P2: Cyclist Paths

Cyclist paths are areas designated for exclusive cyclist use. They are most appropriate where there is: significant cycling demand and low pedestrian demand (or a separate footpath is available), limited vehicle crossings, and an alignment that allows for safe, uninterrupted journeys at relatively constant speeds.

Considerations include:

- function of the path;
- speed and volume of traffic;
- needs of likely users (i.e. varying experience levels);
- drainage; and
- adjacent areas that are forgiving to errant cyclists.

Intersections, underpass access points and other possible conflict locations should be avoided at the bottom of steep gradients, except where there is no alternative.

Important considerations include:

- safe and convenient road and/or footpath crossings with sufficient sight distance;
- warning to cyclists that they are approaching a crossing;
- warning to motorists that a cyclist crossing is ahead;
- way-finding signage; and
- lighting.

	Path width (m)	
	Local access path	**Major path**
Desirable minimum	2.5	3.0
Minimum – typical maximum (subject to volume)	2.5 – 3.0	2.5 – 4.0

Table 7: Recommended path width (source: Cycling Aspects of Austroads).

Photo 24: Coastal Cycling path, Perth.

Photo 25: 2-way cyclist path, Sydney.

Photo 26: Cyclist path and footpath crossing, Perth.

Design Toolkit No. P3: Shared Paths

A shared use path allows for both pedestrian and cyclist use. They can be used for recreation, local access and linking other on-road lanes or paths to ensure continuity.

Shared paths are appropriate where:

- demand exists for both walking and cycling, however the intensity of use is not so great to warrant separate facilities;
- an existing low use footpath can be modified to allow sharing by cyclists (this is particularly useful to provide a safe link between a side-street and a mid-block pedestrian actuated crossing on an arterial road); and
- there is an existing nearby road which allows for faster cyclists (e.g. with an on-road bicycle lane) to reduce the extent of potential conflict between pedestrians and higher speed cyclists.

Shared paths along existing footpaths can offer best practice where they provide a safe and convenient option for young and/or inexperienced cyclists (i.e. within proximity to schools and parks) and at 'squeeze points' (i.e. narrow, busy sections of road, railway level crossings, bridges, underpasses). As noted above, they can provide important short off-road links to connect a side street with a pedestrian crossing.

Other considerations include; safe and convenient crossings where path meets road, way-finding signage and lighting.

	Path width (m)		
	Local access path	**Commuter path**	**Recreational path**
Desirable minimum	2.5	3.0	3.5
Minimum – typical maximum (subject to volume)	2.5 – 3.0	2.5 – 4.0	3.0 – 4.0

Table 8: Recommended path width. *Source: Cycling Aspects of Austroads Guidelines.*

Photo 27: Typical shared Path.

Photo 28: Shared Path as well as on-road lanes for faster cyclists, Hindmarsh SA.

Photo 29: Section of footpath converted to shared path to access signalised crossing.

Design Toolkit No. P4: Separated Paths

Separated paths are most appropriate where there are significant volumes of both cyclists and pedestrians and a shared use path would present increased conflict potential. Generally, separated paths are effective in areas that attract high recreational or commuter walking and cycling (e.g. beachside promenades, bridges etc.).

Generally designed as two-way facilities, separated paths are not common and public understanding of their correct use is limited. Adequate signage, pavement symbols and varying pavement surfaces are often required to delineate the pedestrian and bicycle zones. Best practice design includes a physical separation between the cyclists and pedestrians such as landscaping.

	Separated two-way Path width (m)		
	Bicycle path	**Footpath**	**Total**
Desirable minimum	2.5	2.0	4.5
Minimum – typical maximum (subject to volume)	2.0 – 3.0	≥ 1.5	≥ 4.5
	Separated One-Way Path width (m)		
	Bicycle path	**Footpath**	**Total**
Desirable minimum	1.5	1.5	3.0
Minimum – typical maximum (subject to volume)	1.2 – 2.0	≥ 1.2	≥ 3.4

Table 9: Recommended path widths (Source: Cycling Aspects of Austroads).

Photo 30: one-way separated path, Hamburg Germany (cycle path red paved / footpath (2-way) grey paved – separated by cobblestones).

Photo 31: Two-way separated path, UK.

On-Road (R)

Design Toolkit No. R1: Enhanced Bicycle Lanes

Enhanced bike lanes offer stronger separation between cyclists, moving vehicles and/or parked cars, and/or higher visibility. They strengthen standard lane types such as Exclusive or Bicycle Car Parking Lanes. They are achieved through various measures, such as: wider line marking, chevron line marking, green-coloured lane marking or tactile marking. Enhanced bike lanes are not a physical separation so do not prevent vehicles from crossing over it. Enhanced lanes offer a more cost effective solution than physical separation (i.e. kerbing) and require less space. Design criteria will differ depending on the type of enhancement, but in general they are the same width as Exclusive Bicycle Lanes (refer Toolkit for details)

The DPTI guidelines for installing green coloured lanes stipulate that they are to be used only in areas of potentially high conflict between cyclists and motorists, these include:

- between multi-lane approaches to signalised intersections i.e. between two left turn and multiple through lanes;
- where cyclists are exposed to motor vehicle traffic crossing the bicycle lane over significant length of road i.e. greater than 80m;
- where the volume of motor vehicle traffic crossing the bike lane exceeds 2,800 vehicles per day;
- where there is a recorded pattern of collisions between cyclists and motorists;
- where a bicycle lane is located next to or between vehicle lanes but the desirable minimum vehicle and bicycle lane widths are not achievable; and
- where a bicycle lane is located on a left hand curve where vehicles routinely cut into the bicycle lane.

Refer to the DPTI Operational Standard prior to the selection of Green Lanes.

Figure 29: Chevron separated lane.

Figure 30: Green lane and tactile edge strip.

Design Toolkit No. R2: Separated Bicycle Lanes

Separated bike lanes include physical separation (usually kerbing) between cyclists and motor vehicles. The physical separation results in less traffic stress for some cyclists than a traditional painted line. There are however safety concerns due to the cyclist being less visible to the traffic lane by vehicles turning into side streets and parking removal is usually required to ensure sufficient sight lines at all crossings. This treatment is often a high-cost solution and requires a wide road cross section.

Separated bicycle lanes:

- have been associated with increased participation due to high level of amenity;
- are used on routes that provide direct connections to major destinations;
- are used where there high traffic and high cyclist volumes; and
- an alternative solution if a direct off-road path cannot be achieved.

Design criteria include:

- width to consider a fast cyclist passing a slow cyclist (typical 2m wide);
- clear space for car doors to open (if required) (typical 1m wide);
- traffic volumes greater than 7,000 vehicles per day (if road speed 50km/h);
- traffic volume greater than 5,000 vehicles per day (if road speed 60km/h);
- a street with few side streets and driveways to ensure sight lines are maintained;
- car parking removal is generally required either side of road crossings and driveways; and
- separated lane re-joins the road as an exclusive bicycle lane prior to major intersections, unless specific cyclist crossing provided.

Type 1: Kerb separated Bicycle Lanes

Kerb Separated lanes include physical separation of kerbing between cyclists and moving traffic.

Type 2: Between kerb and parked cars

Separated bicycle lanes between the kerb and parked cars are installed by 'flipping' the parking and the bike lane so that cyclists ride alongside the kerb and parked cars sit between the cyclist and the moving vehicle traffic.

Photo 32: Bike lane separated by parked cars, Albert Street Melbourne.

Photo 33: Kerb separated bike lane, Frome Street, Adelaide.

Design Toolkit No. R3: Exclusive Bicycle Lanes

An exclusive bicycle lane provides the basic level of separation between cyclists and motor vehicles. The bicycle lane is generally marked by a single white line which delineates road space, however the single white line is not considered a safe-enough separation by some cyclists, and therefore could dissuade some people from cycling.

The lanes are provided on both sides of the road in the same direction as the vehicle traffic. Cars are prohibited from parking in exclusive bike lanes, unless it is signed as 'part-time' only, usually in Clearways. Part-time bicycle lanes are not preferred as cyclists are forced into the traffic lane outside of operating times. However, where on-street parking is non-negotiable, part-time lanes are preferred over no lanes at all.

Exclusive bike lanes are suitable for many cycling routes with moderate speeds and volumes, but may not encourage less confident riders to cycle on roads with speeds above 50km/h.

	Lane width (m)		
Road posted speed limit (km/h)	**60**	**80 (off-road path preferred)**	**100 (off-road path preferred)**
Desirable	1.5	2.0	2.5
Accepted range	1.2 – 2.5	1.8 – 2.7	2.0 – 3.0

Table 10: Exclusive lane width (source: Cycling aspects of Austroads).

Photo 34: Exclusive Bicycle Lane, Adelaide SA.

Design Toolkit No. R4: Bicycle Car Park Lanes

Bicycle/parking lanes (BCPL's) are located between parked cars and moving traffic. They delineate space for cyclists but can result in cyclists feeling squeezed between car doors potentially opening (parallel parking) or reversing cars (angle parking); and moving traffic. Wider lanes are preferred to provide as much space as possible without appearing to look like a vehicle lane. Generally, they do not require the removal of any car parking, but do need a generous road width.

	Parallel Parking - Overall facility width (m)	
Road posted speed limit (km/h)	**60**	**80**
Desirable	4.0	4.5
Accepted range	3.7 – 4.5	4.0 – 4.7

Table 11: Recommended dimensions for parallel parks (source: Austroads aspects of cycling)

With angle parking, an opening car door does not pose a threat to cyclists, however cyclists must remain alert to reversing vehicles in to their path, as motorist sight distance is often poor when reversing.

	Angle Parking - Overall facility width (m)		
Parking angle (degrees)	**45**	**60**	**70**
Desirable	7.3	7.6	8.0
Acceptable range	7.1 – 7.8	7.4 – 8.1	7.8 – 8.5

Table 12: Recommended dimensions for angle parking (source: Austroads aspects of cycling)

Photo 35: Bicycle car parking lane - parallel parking, Osmond Tce, Norwood.

Photo 36: Bicycle car parking lane: angle parking, Hutt St Adelaide.

Design Toolkit No. R5: Contra-flow Lanes

A contra-flow bike lane is installed on a one-way road and permits cyclists to travel in both directions.

Contra-flow lanes:

- should be considered where there is sufficient road width to provide a safe treatment;
- should have an appropriate width:
  - absolute minimum: 1.5m;
  - desirable: 1.8m;
- have clear signage and line marking to alert motorists and cyclists of the conditions;
- are generally appropriate in low speed zones (50 km/h max); and
- should be physically separated from motor traffic in higher speed zones.

Photo 37: Contra-flow lane, City of Yarra Vic.

Photo 38: Contra-flow street, Sydney.

Design Toolkit No. R6: Sealed Shoulders

Where a road is unkerbed and there is some demand for cyclist use, a smooth sealed shoulder provides space outside of the traffic lane for cyclists. Austroads recommends that shoulder lane widths are the same as recommended for Exclusive Bicycle Lanes (refer Toolkit No. 11). In addition, Table 8 lists recommended shoulder widths for rural roads.

Unkerbed roads are usually outside of urban environments where traffic speed may be higher. Traffic speed and volume as well as percentage of heavy vehicles must be considered when designing cyclist facilities for rural roads.

Where possible, enhancing the white line (refer Toolkit No. 9), e.g., providing a wider line than a standard 100mm width is recommended on roads with higher traffic speeds and volumes.

	Traffic volume (Annual Average Daily Traffic: AADT)				
Element	**1 -150**	**150 – 500**	**500 – 1,000**	**1,000 – 3,000**	**> 3,000**
Total shoulder	2.5m (unsealed)	1.5m	1.5m	2.0m	2.5m
Minimum sealed shoulder[1]	0	0.5	0.5	1.0	1.5

Table 13: Rural road shoulder widths (source: Austroads Aspects to Cycling)

Although not directly related, the widths within these tables are not inconsistent with each other and provide basic correlation when considering urban sealed shoulders. Consideration should also be given to using a maximum size 10mm stone seal to provide a smoother, less abrasive and safer riding environment for cyclists.

Photo 39: Main North Road, sealed shoulders.

Design Toolkit No. R7: Advisory Treatment

Advisory treatments do not have legal status as bicycle lanes, but are useful on streets with low traffic volume to connect the network.

They comprise bicycle pavement symbols, which indicate to motorists that cyclists may be present and also define way-finding for cyclists along part of a network.

As they do not mark a separate space for cyclists they do not necessarily encourage cautious cyclists to ride, particularly on streets with higher traffic volumes, however, road width constraints sometimes mean these are the only possible treatment available to bridge short sections of a bicycle route. Where these routes meet busy roads, safe crossing points must be provided to ensure connectivity. Traffic calming options can be considered if speed reduction is necessary.

Each street must be assessed specifically to determine the most appropriate location to place the logos. They can be placed against the kerb in a street with low parking demand or in the centre of the travel lane in a slow speed 'mixed traffic' street (less than 30km/h). They should not be placed close to parked cars where cyclists could be hit by opening doors (the 'dooring zone').

Design considerations include:

- traffic calming is recommended if 85th%ile speeds are measured above 40km/h;
- route-finding signage may also supplement the logos; and
- this treatment is non-regulatory.

Photo 40: Advisory Treatment on local bike route, Norwood.

Design Toolkit No. R8: Bicycle Boulevard

A Bicycle Boulevard is an integrated approach that can be adopted on a strategic route that links important destinations and has high cyclist volumes. They can be installed in streets that are not wide enough to fit a bicycle lane and they usually do not require the removal of a significant amount of car parking, if any.

All types of vehicles are generally allowed along a Bicycle Boulevard, but the look and feel of the roadway is that of a cycling street which is achieved by prominent logos, and signage. High profile Bicycle Boulevards can also include cycling related public artwork to further highlight the 'cycling street' concept.

Bicycle Boulevards are not a 'traffic control device' as such, and therefore do not require DPTI approval. Regulatory signage is not required as cyclists are permitted to ride in the carriageway when bicycle lanes (with legal status) do not exist.

For cyclists to feel comfortable in mixed traffic, traffic speed should be slow so that there is not a large speed differential between travel modes. Traffic calming may be required to achieve acceptable speeds (≤ 30km/h) and traffic diversion may be required to achieve acceptable traffic volumes (< 3000 vehicles per day preferred).

Measures for a successful Bicycle Boulevard include:

- reduce vehicle speeds (if 85thile >40km/h), through traffic calming to speeds around 30km/h;
- reduce vehicle volumes if above 3,000 vehicles per day;
- provide safe road crossings at intersections with major streets and arterial roads (median refuge islands, signals, kerb extensions);
- install pavement bicycle logos in the centre of the carriageway (note that Sharrows (logos with arrowheads) have recently been approved under *Operational Instruction 9.4 Advisory Bicycle Pavement Marking: Shared Lane Marking (Sharrow)* (Photo 35);
- install prominent way-finding signage; and
- an environment that raises awareness for all road users that cyclists are encouraged and it is a cyclist-friendly route. This can be done through urban design features, public art, signage, sculptures, and entrance statements or similar.

Photo 41: Directional logos 'sharrows' in Croydon, SA.

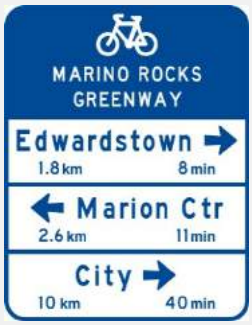


Photo 42: example of signage.

Photo 43: Example of supplementary public art, Oslo, Norway.

Road Crossings (C)

Design Toolkit No. C1: Universal Kerb Ramps

It is essential that kerb ramps are provided at every interface between any path (pedestrian and/or cyclist) and a road crossing, and that their position, design and installation complies with all relevant Australian Standards.

It is recommended that an audit of all paths identify where upgrades are required.

When locating kerb ramps, it is important to ensure that they are located on both sides of the roadway – directly opposite and in-line with each other.

Every kerb ramp comprises:

- the ramp - from top of kerb to roadway;
- the top landing, where pedestrians move between the ramp and the footpath;
- the approach, the section of footpath next to the top landing; and
- the gutter, which is the drainage trough at the roadway edge, a smooth transition (not a lip).

Photo 44: Universal kerb ramp.

Design Toolkit No. C2: Median Refuge

A median refuge provides a protected space for pedestrians and/or cyclists to wait in the centre of the road and cross the road in two stages.

Design criteria includes:

- sufficient width is required provide space for a cyclist or a person pushing a pram without protruding into the traffic lane. A bicycle is 1.75 metres long and so the refuge should be 2 metres wide at least (3 metres desirable), although 1.8m is acceptable if the road width is not sufficient. If there is a high demand for pedestrians or cyclists to wait in the refuge (school or busy cycling route), additional waiting space should be provided and assessed on a case by case basis; and
- refuges are recommended if traffic volumes exceed 3000 vehicles per day.

Photo 45: Cyclist only refuge, Portrush Road, Norwood.

Photo 46: Shared refuge, Wakefield Street, Adelaide.

Design Toolkit No. C3: Wombat Crossing

A Wombat Crossing is a raised pedestrian crossing and the only form of Zebra Crossing currently permitted in South Australia.

The South Australian Manual of Legal Responsibilities and Technical Requirements for Traffic Control Devices Part 2 – Code of Technical Requirements (DPTI), requires the following warrant for a Wombat Crossing:

1. *In two separate one hour periods of any day (including Saturday and Sunday):*
    a. *40 or more pedestrians per hour actually cross the road and could reasonably be expected to use the crossing; and*
    b. *200 or more vehicles per hour pass the site where the pedestrians cross during the same two hours.*

OR:

2. *During eight hours of any day:*
    a. *An average of 20 or more pedestrians per hour, cross the road (a total of 160 or more in 8 hours) and could be reasonably be expected to use the crossing; and*
    b. *An average of 200 or more vehicles per hour pass the site during the same 8 hours (a total of 1600 or more in 8 hours).*

However, it is important to note that pedestrian planners Australia-wide are ignoring strict warrants such as these as they recognise the benefit of installing pedestrian crossings with less stringent requirements. Council are encouraged to liaise with DPTI regarding locations for Wombat crossings, where warrants are not met.

Photo 47: Wombat Crossing where a shared path meets a road.

Design Toolkit No. C4: Head-start Lantern

A major hazard for cyclists is that motorists do not see them at intersections. Priority given to cyclists at signals can place cyclists in front of motorists and therefore increase their visibility and therefore motorist awareness. Cyclist lanterns can be installed at signalled intersections, where they turn green a few seconds before the vehicle green highlighting their presence and increasing safety.

Photo 48: Head-start cyclist lantern, South Tce/Pulteney St, Adelaide.

Design Toolkit No. C5: Bicycle Head Start & Storage Area

Bicycle storage areas or 'bike boxes' provide a designated space for cyclists to sit in front of motorists waiting at signalised crossings and intersections.

Current Standards allow bicycle storage areas to be installed at the end of a bicycle lane. However, this is currently under review for change of legislation, to be in line with Victorian Standards. Therefore, it is likely that in the near future bike storage areas will be able to be installed without a bicycle lane leading into it. This would be advantageous on DPTI roads where the bike lanes terminate before reaching the signals. Assessment for feasibility and installation would be at the discretion of DPTI.

There are various types of these treatments available. It is likely that these treatments would be applicable on DPTI roads within the Council area. Council should consult Austroads Aspects of Cycling to determine their appropriate use prior to liaising with DPTI if they are to be considered.

Photo 49: Bicycle Head Start Storage area (one type), Pirie Street Adelaide.

Design Toolkit No. C6: Hook Turn Storage Area

A hook turn storage area is provided to accommodate cyclists in a safe position while they are waiting for a green traffic signal phase for the intersecting road. This treatment can be used generally throughout the road system.

Cyclists undertake a hook turn by travelling straight at the intersection and giving way at the far corner of the intersecting road for safe crossing. Hook turn storage boxes provide guidance on where cyclists can wait and can be used at a traditional intersection and T-junction.

Photo 50: Hook turn storage boxes at South Tce/Pulteney St, Adelaide.

Design Toolkit No. C7: Roundabout design for cyclists

Austroads are currently preparing a new publication with roundabout design guidance that considers cyclist safety. In the past, Australian roundabouts have been designed as 'tangential' which direct cyclists to the edge of the lane while motor vehicles remain in the centre at higher speed. Recent research which will be included in the updated Austroads Guideline has found that 'radial' design is preferred as it directs cyclists to the centre of the lane where they 'claim their space' in front of motorists, becoming more visible.

Tangential roundabouts can be reviewed to ascertain if their approach and departure can be modified to a more radial design. If a roundabout with a history of crashes cannot be improved through design, other measures should be employed. These include signage, and also speed reduction measures on the approach to the roundabout, such as installing a distinctive surface, strips of alternate pavement to change the road texture or raised platforms.

Photo 51: Tangential roundabout, St Peters SA.

Photo 52: Radial roundabout (preferred design), Largs Bay, SA.

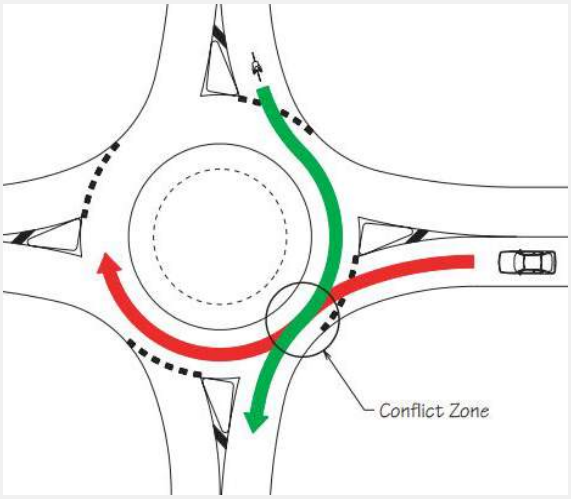


Figure 31: Cyclist and vehicle conflict zone at a roundabout.

Source: Bicycle Network Victoria.