

TOWN OF GAWLER

Walking and Cycling Plan 2018-2028

JULY 2018



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PROJECT TITLE

Walking & Cycling Plan 2018-2028

CLIENT



CLIENT

CONTACT

Ben DeGilio
Town of Gawler
PO Box 130
Gawler SA 5118

CONSULTANT

&



CONSULTANT

CONTACT

Gayle Buckby & Alicia Holman (InfraPlan)
Level 3, 66 Wyatt Street
Adelaide SA 5000
e: gayle@infraplan.com.au
t: 08 8227 0372

CONSULTANT ABN

29 582 803 072

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**‘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’**



1. EXECUTIVE SUMMARY

The purpose of this Walking and Cycling Plan is to enable people of all ages and abilities across the Town of Gawler to choose walking and/or cycling as a regular day-to-day activity for transport or recreation, and further promote the Town of Gawler as a unique, vibrant and accessible tourist destination.

During the preparation of this Plan, the Vision for walking and cycling was identified as:

‘Gawler residents choose to walk and cycle more often for transport, local errands, health and enjoyment. Tourism in the region is enhanced by the provision of local and regional walking and cycling routes.’

This Plan was developed by undertaking an extensive analysis of the existing walking and cycling environment (through demographics, site visits, and data) and integrating this information with guidance from Council members, staff, stakeholders and the community. This process helped identify the barriers to walking and cycling uptake and opportunities to enhance the walking and cycling environment for all residents across the Town of Gawler.

The Plan establishes the long-term (ultimate) walking and cycling network, as well as 10-year Action Plan for priority works. The recommendations made in this report are based on safety, connectivity, permeability, amenity, access for all abilities, tourism and planning for future growth.

Recommendations within this plan apply to both Council-owned and State-owned assets, meaning that some works will require partnering with the State Government to complete.

The top 5 priority works identified include:

- Connecting the Jack Bobridge Bikeway to Gawler Bike Hub;
- Connecting the Stuart O’Grady Bikeway to Gawler Bike Hub;
- Connecting the Bike Hub to the River Shared Path Network;
- Improving access and safety to and from Schools; and
- Undertaking a Wayfinding Strategy to install directional signage to key destinations - i.e. Bike Hub/Visitor Information Centre, Train Stations, Shops/cafes, and the River Shared Path network.

Additional Priorities for walking and cycling in Gawler include:

- The ongoing upgrade and widening of footpaths and footbridges;
- Improving safety at busy road crossings, squeeze points and roundabouts;
- Connecting the suburbs of Reid, Willaston and Hewett;
- Connecting the new growth areas;
- Completing the Gawler Greenway; and
- Fill in missing links in the network.

This Plan is intended to be a live-document that is reviewed every five years for reassessment of works and prioritisation.

2. 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 and leisure activities.

Active transport (a form of transport that involves physical activity) is therefore not a singular goal but is an effective tool to create a vibrant city with space for diversity and development. It supports our liveability status by taking pressure off the congested road network, reducing noise and pollution, increasing the health of the community, and supporting a zero-carbon future.

2.1 Strategic Alignment

The Town of Gawler Walking and Cycling Plan Update seeks innovative and practical actions to build on the existing networks and vision outlined in the 2008 Walking and Cycling Plan. The Update will build upon previous works and reflect new legislation, standards and guidelines, council priorities, future growth areas and key Council Town Centre Masterplan initiatives.

This Plan has therefore been prepared in support of key projects and strategies outlined across a suite of strategic documents as illustrated below. A summary of the key documents relevant to this Plan are provided in Appendix A.

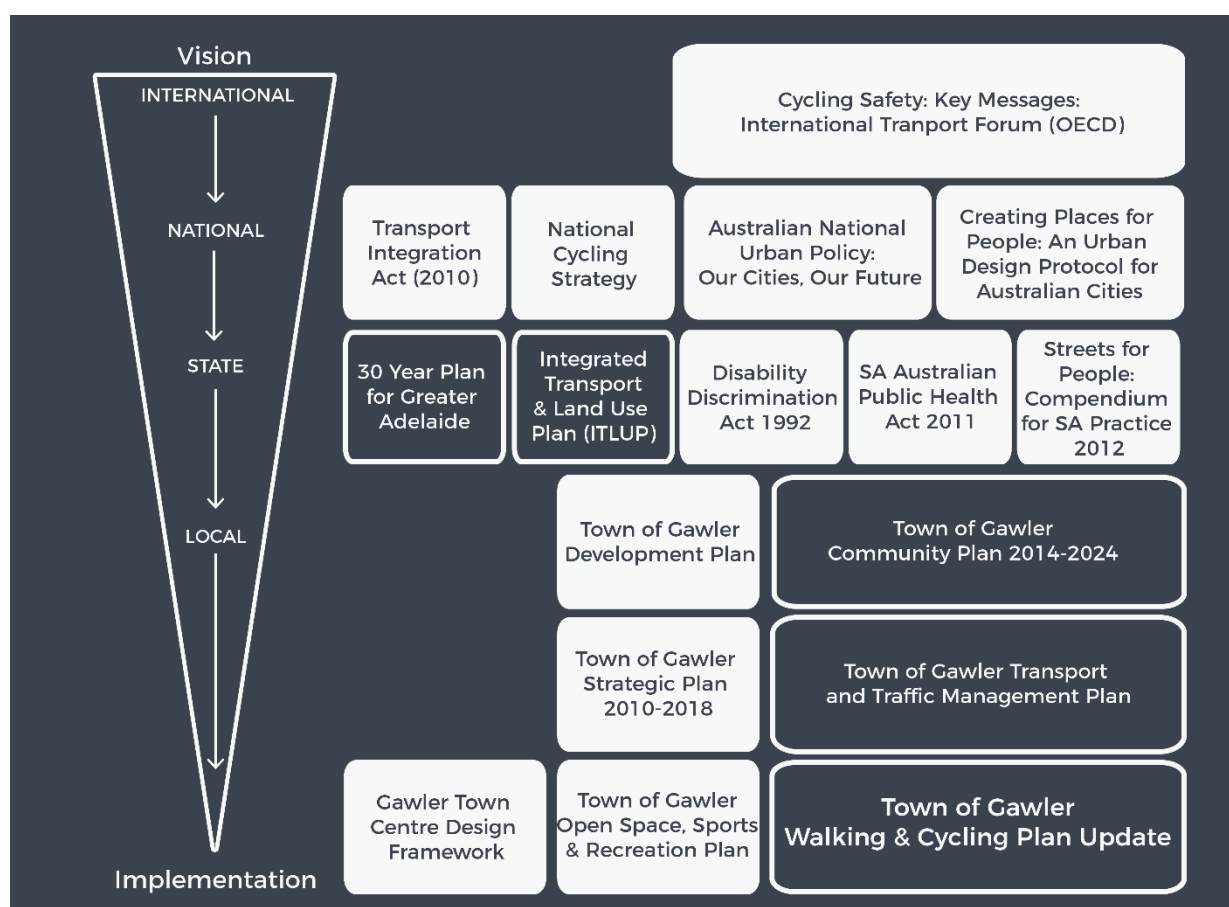


Figure 1: Strategic document alignment

3. THE FUTURE OF WALKING AND CYCLING IN GAWLER

3.1 Visions and Objectives for Walking and Cycling in Gawler

The overarching vision: *‘Gawler residents choose to walk and cycle more often for transport, local errands, health and enjoyment. Tourism in the region is enhanced by the provision of local and regional walking and cycling routes.’* will help achieve the following objectives for walking and cycling in Gawler:

- There is a safe, convenient and connected network of on-road cycling, and off-road walking and cycling routes that cater for all ages and categories of pedestrians and cyclists;
- Quality of life of Gawler residents is enhanced by the many social, environmental, health and economic benefits of walking and cycling;
- River and Rail shared path corridors act as the backbone of the walking and cycling network. They are both recreational and direct routes that provide access around and through the township, and are connected to the on-road network;
- There is a supportive culture of walking and cycling in the community;
- Gawler is well-known for Cycling Tourism; and
- More people use dual-mode transport, e.g. walk or cycle to the train;

3.2 The Challenge of Increasing Active Transport

Increasing the number of walking and cycling trips to, from and within the Town of Gawler 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.

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 2).

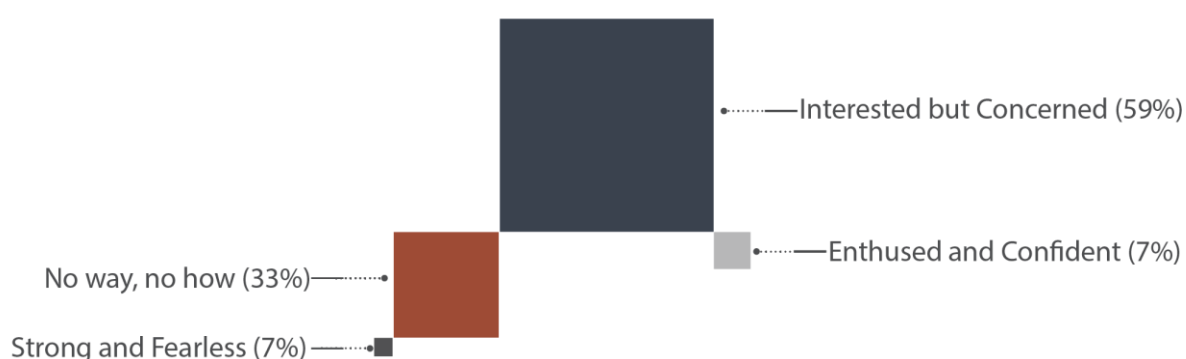


Figure 2: The four types of cyclists and potential cyclists (source: City of Melbourne Bicycle Plan 2012-2016).

As displayed in Figure 3 (overleaf), there are various factors that influence walking and cycling uptake. A number of these factors (health, mobility & fitness, distance, time & terrain, climate, and luggage) cannot be influenced through this plan. It is therefore important to focus on the factors that can be influenced and ensure that when residents do choose to walk or cycle their journey is safe, pleasant and convenient.

The key challenges that the Gawler community face include, balancing the regional through traffic with a safe local walking and cycling network for users of all ages, confidence levels and abilities, and finding ways to move people from cars to active transport modes where possible.

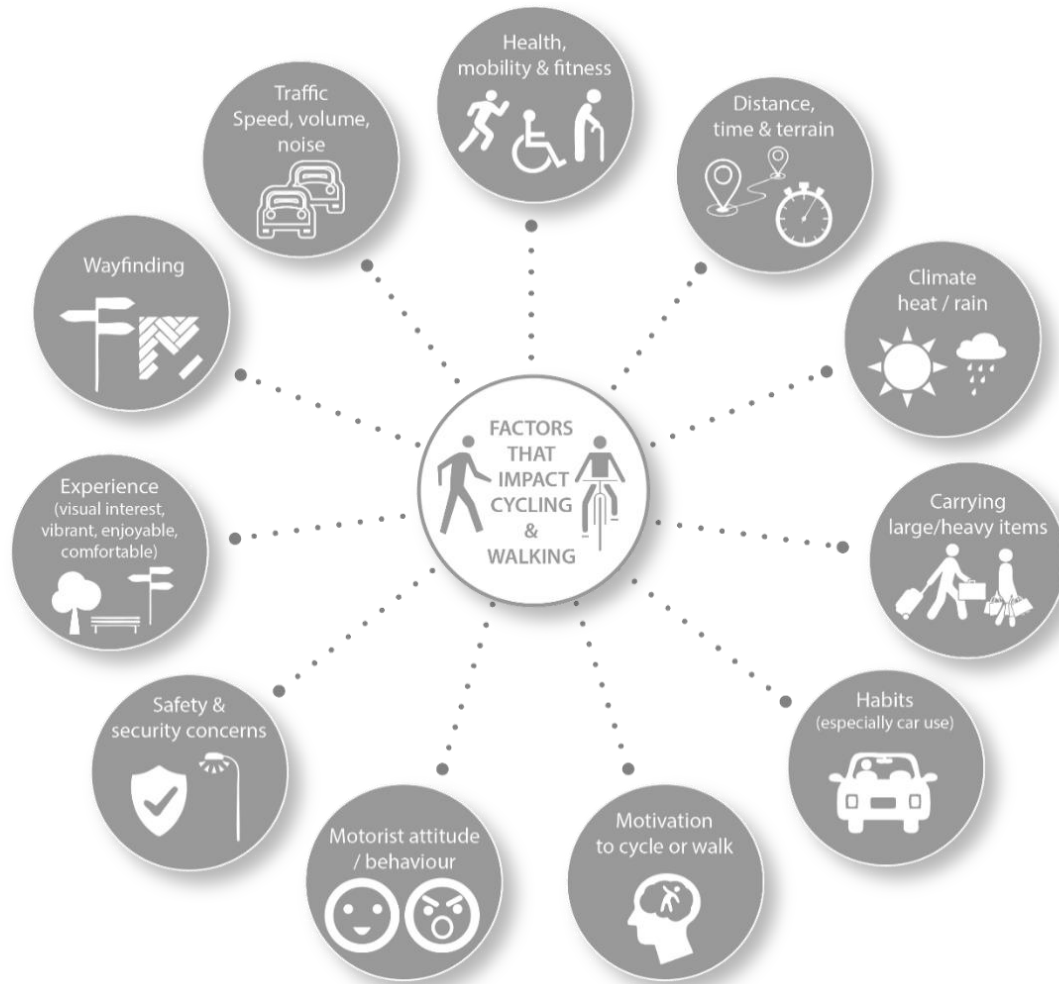


Figure 3: Factors that impact active transport uptake

4. THE TOWN OF GAWLER: A SNAPSHOT

The Town of Gawler is the northernmost Local Government Area of Metropolitan Adelaide and has a population of approximately 23,034 (2016 census). The Council area shares boundaries with the City of Playford to the South and the Light and Barossa regional Councils to the North. The peri-urban landscape of the township acts as an interface between metropolitan and regional Adelaide.

Covering over 41km², there are a number of differing urban forms and land use characteristics within the Council Area (see Figure 4). The South-Western precinct is predominantly rural with large blocks of land for 'rural living' and agricultural purposes. The Northern component of the Council Area is largely residential and is concentrated around the Town Centre. Residential precincts directly surrounding the Town Centre are well established and feature a number of state and local heritage items.

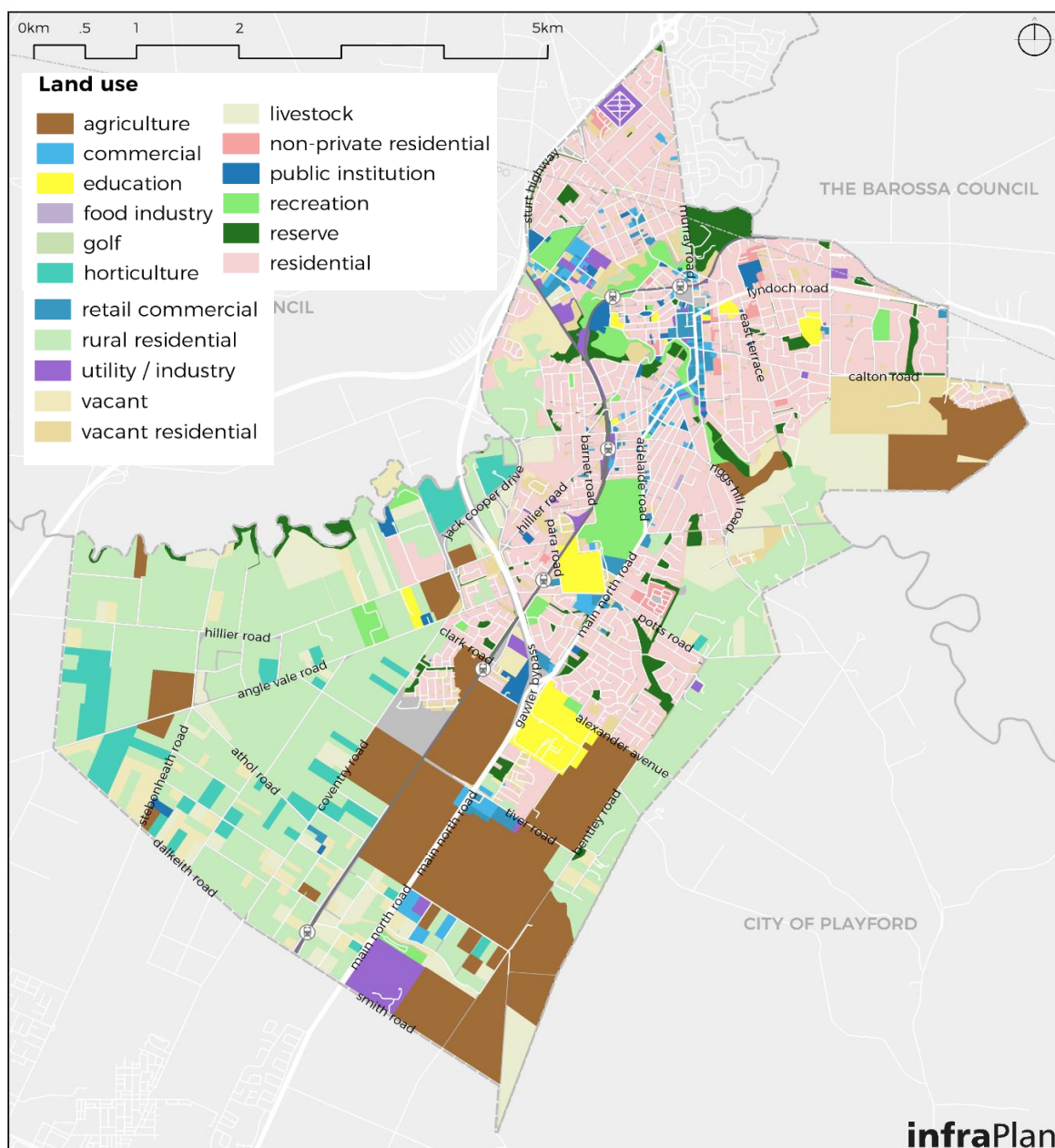


Figure 4: Town of Gawler Land Use Map

The overall population density of the Town of Gawler is 5.5 persons per hectare, which is significantly low density. However, the established areas around the Gawler CBD boast a more compact and walkable urban form when compared to the rest of the Council Area. There are six train stations within the Town of Gawler (Gawler Central, Gawler Oval, Gawler, Evanston, Tambelin and Kudla) which make up the final stops of the Gawler Central Line from the Adelaide CBD.

Compared to Greater Adelaide, the Town of Gawler hosts a significant portion of residents under the age of 19 (25.4%), and conversely there is a high percentage (37%) of residents over 60 years of age (see Figure 6 overleaf). Often people in these age groups rely on active transport modes such as walking and cycling to meet daily needs, and are therefore important to consider in the review of the 2008 plan.

In terms of travel behaviours, 2016 census data indicates that the private car is still the dominant mode of travel to work. The share of residents commuting to work via car (as a driver or passenger), however, has declined since 2006 from 84% to 76.2% in 2016. Despite this decrease in car travel, walking and cycling make up a very small percentage of the mode share with only 1.7% of residents walking to work and 0.2% cycling. These figures show a decline in walking and cycling since 2006 where 3% of residents walked to work and 0.3% cycled.

The share of employed residents who work in the Town of Gawler has also declined since 2006, from 32% to under 25% in 2011 (see Figure 5). This may explain lower walking and cycling rates as the number of residents living within comfortable walking/cycling distance of their workplace has reduced. A significant portion of the local workforce live outside the Town of Gawler (57%) making walking and cycling connections between neighbouring councils an important part of this plan review.

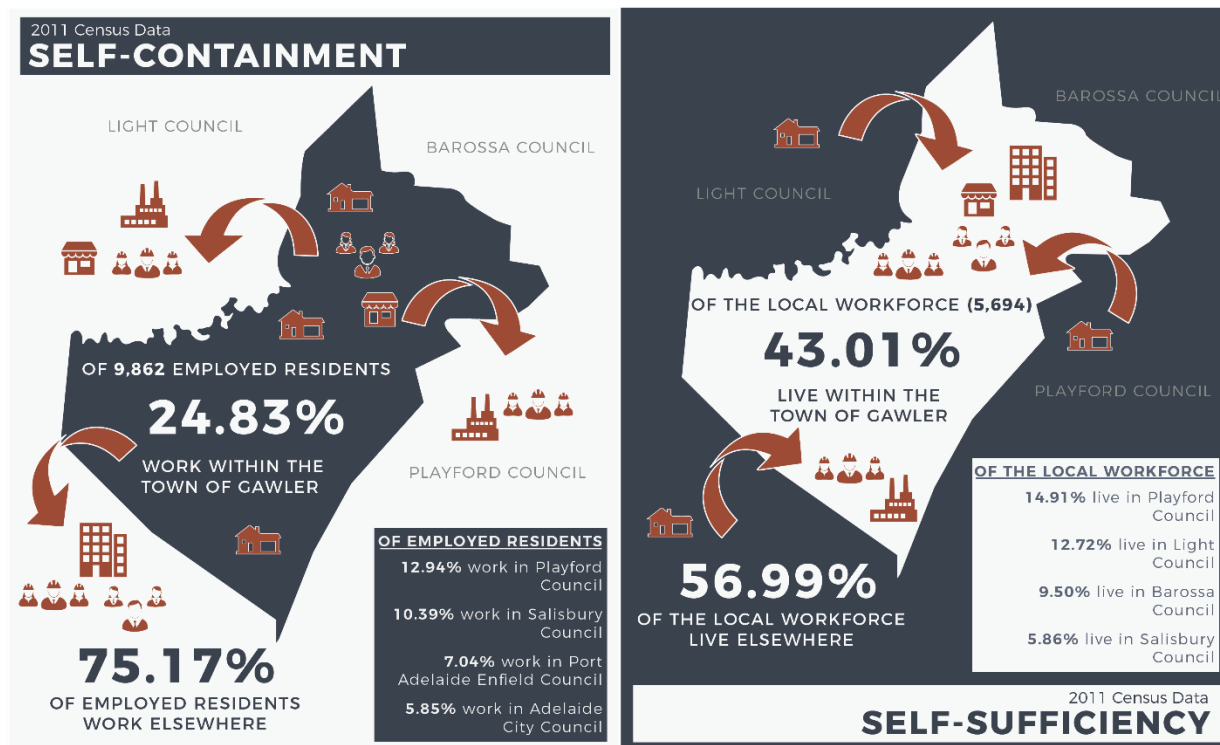


Figure 5: Town of Gawler self-containment and self-sufficiency

2016 Census Data

COMMUNITY SNAPSHOT

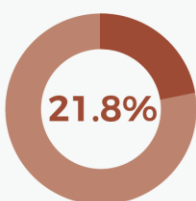
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TOTAL POPULATION



NEW RESIDENTS

4,121 since 2006



AVERAGE HOUSEHOLD SIZE



CULTURAL DIVERSITY

23.6% of residents born overseas
(Compared to 31.8% in Greater Adelaide)



United Kingdom

11.1%

Greater Adelaide: 7.6%



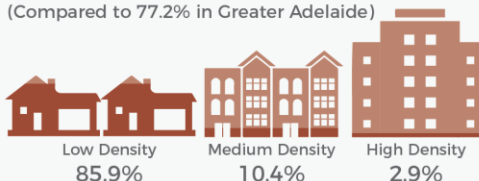
Italy

0.7%

Greater Adelaide: 1.6%

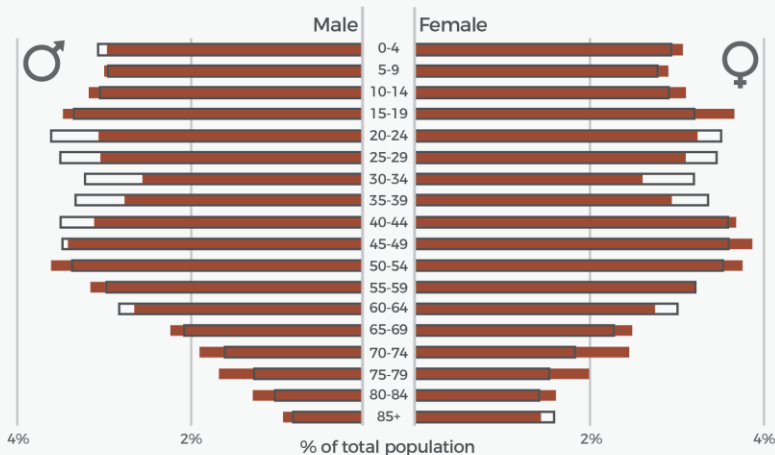
HOUSING DIVERSITY

85.9% detached dwellings
(Compared to 77.2% in Greater Adelaide)

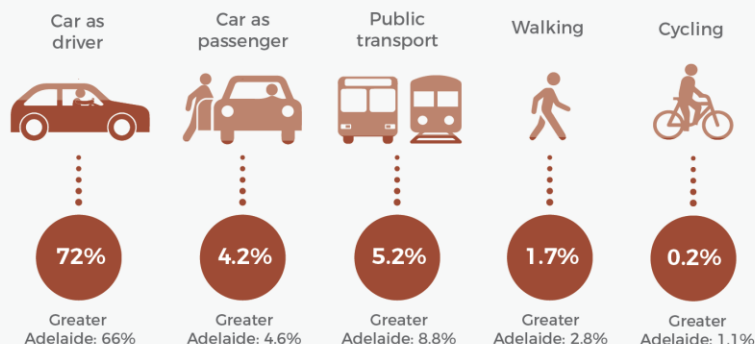


AGE GROUPS BY GENDER

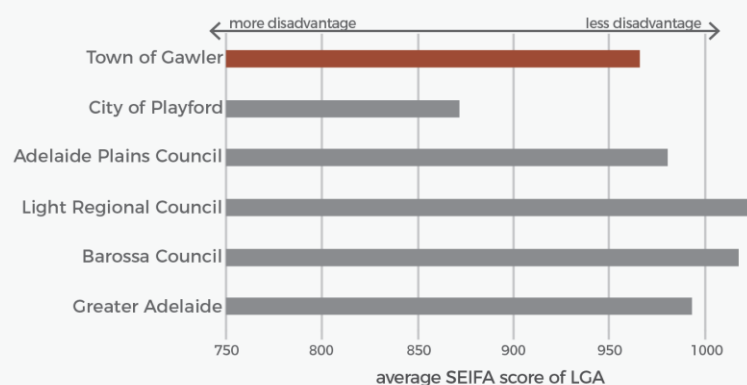
Town of Gawler - Median age: **41**
Greater Adelaide - Median age: **39**



JOURNEY TO WORK (JTW)



SOCIO-ECONOMIC ADVANTAGE/DISADVANTAGE (SEIFA)



COMPARED TO GREATER ADELAIDE



Town of Gawler: 8.4% unemployed
Greater Adelaide: 7.7% unemployed



Town of Gawler: \$1,112 per week
Greater Adelaide: \$1,265 per week



Town of Gawler: 53.9% year 12 or higher
Greater Adelaide: 62.5% year 12 or higher



Town of Gawler: \$1,400 per month
Greater Adelaide: \$1,517 per month



Town of Gawler: 29.3% rental housing
Greater Adelaide: 28.9% rental housing

Figure 6: Town of Gawler Demographic Summary

4.1 Growth Areas and Development

The Town of Gawler has seen significant population growth, with an additional 4,121 residents between 2006 and 2016 (21.8% growth over 10 years). This is due to the expansion of the urban growth boundary in 2007 which saw various areas earmarked for greenfield development within and surrounding the Council Area.

Figure 7 illustrates the key residential growth areas within the vicinity of the Town of Gawler as per the 30-Year Plan for Greater Adelaide. While there is significant growth expected within the southern and eastern areas of the township, there are also large areas to the north such as Roseworthy and Concordia which are outside of the council area but will rely on the Gawler town centre for various goods and services.



Figure 7: 30-Year Plan Growth Areas

A number of these growth areas are planned and/or currently being developed (refer Figure 8). These developments have potential to add up to 23,000 additional residents within the council area and an extra 18,000 on the border of the neighbouring Barossa Council. This could result in up to a total of 64,000 persons accessing the Gawler town centre for goods and services.

Some of these growth areas, such as the Springwood development, have well-planned walking and cycling connections, however these are not yet endorsed by council. These growth areas are accompanied by a proposal for a future 'Gawler East Link Road' which will service the new developments on the east of the township. The masterplans and supporting documents for the current and future developments have been reviewed and included in the proposed walking and cycling networks and any traffic and transport related projections and proposals have been considered. A summary of these Master Plans is provided in Appendix B.

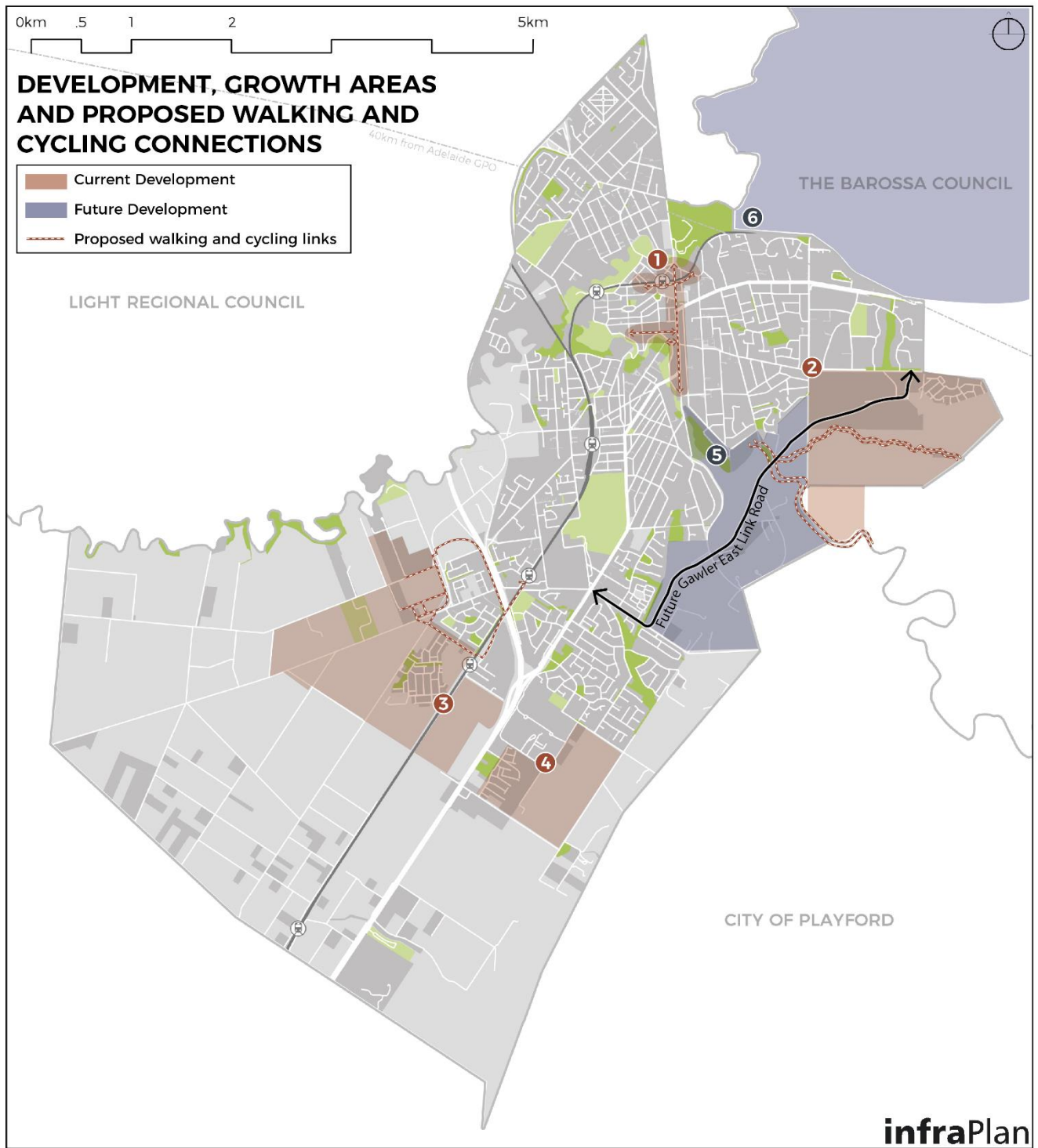


Figure 8: Current and future growth areas



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

5. THE CURRENT WALKING AND CYCLING ENVIRONMENT

Although considerable works have been undertaken to improve the Walking and Cycling Environment in Gawler, there are still significant gaps in the network that result in barriers to walking and cycling uptake. This chapter summarises key findings from site visits and data analysis. Additional detail on the data used to inform this chapter is provided in Appendices C and D.

5.1 Review of the 2008 Walking and Cycling Plan

Since the 2008 Walking and Cycling Plan was adopted, The Town of Gawler has implemented a significant amount of walking and cycling infrastructure along the river corridors. Observations indicate that these shared paths are popular, and the investment has resulted in a significant uptake of people walking and cycling for enjoyment. However, further work is needed to connect these paths to useful destinations in and around the township and position walking and cycling as legitimate transport choices.

Since 2008 there has been changes in Council and Traffic Act legislation, the development of an Integrated Urban Design Framework and Town Centre Masterplan, rapid residential growth and associated development, all combining to make a review of the 2008 Walking and Cycling Plan a necessity.

On-street bicycle lanes have been installed on Hill Street, the southern end of First Street, parts of Second Street and Fourth Street. These streets were not a recommendation of the 2008 plan. They run parallel to one another and do not form part of a cycling network. It is assumed that these have been installed as a traffic calming measure by visually reducing the width of the road with line marking. Bicycle symbols (sharrows) have also been installed on some of the roads in Reid and Gawler East.

Some arterial roads have bicycle lanes or sealed shoulders that provide space for cyclists. However there are critical gaps in the main road cycling network, most notably along sections of Main North Road, Ryde Street, Twelfth Street, Lyndoch Road.

5.2 Site Visits: Issues, Barriers and Observations

Three site visits were conducted to review the walking and cycling environment throughout the Town of Gawler. These site visits aimed to assess the safety, coherence, directness, comfort and attractiveness of key cycling routes and walking networks. Site visits were undertaken on the 16th & 18th June and 19th July.

5.2.1 Walking Issues, barriers and observations

The key re-occurring issues, barriers and observations for pedestrians were:

- Many footpaths are narrow (less than 1.2m wide)
- There is a lack of wayfinding around the township, particularly to train stations and shared paths,
- Several footbridges are too narrow for cyclists and pedestrians to share,
- There is temporary footpath clutter in commercial areas (i.e. sandwich boards, shop displays),
- There are permanent footpath obstructions (i.e. stobie poles) in narrow footpaths,
- Kerb ramps are non-compliant in some areas,
- Some wide commercial driveway crossings result in a long pedestrian crossing distance,
- Many busy road crossings without safe pedestrian infrastructure,
- Severance created by rail corridors, and
- There are poor quality walking links around railway stations.



Photo 1: Footpath not continuous corner of Powell Drive



Photo 2: No footpath on Gawler River bridge, Two Wells Road. Pedestrians must walk behind safety barrier to access



Photo 3: Narrow footbridge over South Para River, just north of Walker Place



Photo 4: Footpath blocked by stobie pole - King Street



Photo 5: Footpath clutter on shoreline - Murray Street



Photo 6: Narrow footpath and no kerb ramps - Eighth Street

Figure 9: Some key issues for pedestrians (refer Appendix C for additional)

5.2.2 Cycling issues, barriers and observations

The key re-occurring issues, barriers and observations for cyclists were:

- There is a lack of wayfinding around the township, particularly to train stations and shared paths,
- It is unclear how to ride from/to the Stuart O'Grady Bikeway and the Jack Bobridge Bikeway,
- There is a lack of space for cyclists on arterial roads,
- There are squeeze points at intersections,
- It is difficult to cross busy roads,
- Most footbridges are too narrow, and
- There are many informal/un-sealed paths.

The key issues are illustrated and spatially represented in Appendix C. Issues occurring on the State road network are differentiated and will require liaising with DPTI for resolutions.



Photo 4: Potentially hazardous squeeze point for cyclists at Barnett street, adjacent to Gawler College



Photo 5: Potentially hazardous squeeze point for cyclists on Adelaide Road at Nineteenth Street intersection



Photo 6: Potentially hazardous squeeze point for cyclists on Adelaide Road at Sixth Street intersection



Photo 7: Potentially hazardous squeeze point for cyclists at northern side of Gawler River bridge on Two Wells Road



Photo 8: Path leading from Eighth Street to Whitelaw Terrace footbridge too narrow for bi-directional walking and cycling



Photo 9: Approach angle and width of footbridge south of Whitelaw Terrace too steep/narrow for the high levels of cycling, pedestrian activity from shopping centre.

Figure 10: Some barriers to cycling (refer Appendix C for additional)

5.3 Existing Footpaths

Figure 11 (overleaf) illustrates existing footpath provision and widths across the council area. Footpaths within high areas of pedestrian activity, such as the town centre are a minimum of 1.5 metres wide. In most residential areas, footpaths generally range between 1 and 1.49 metres wide, however, some paths are less than 1 metre wide and some precincts with low traffic volumes do not have footpaths at all.

Recently the Town of Gawler has increased the minimum footpath width to 1.5 metres across the Council Area, and footpath widening is to be rolled out incrementally across the entire township. The 2018-2028 Walking Network will act as a guide for Council in prioritising this roll-out.

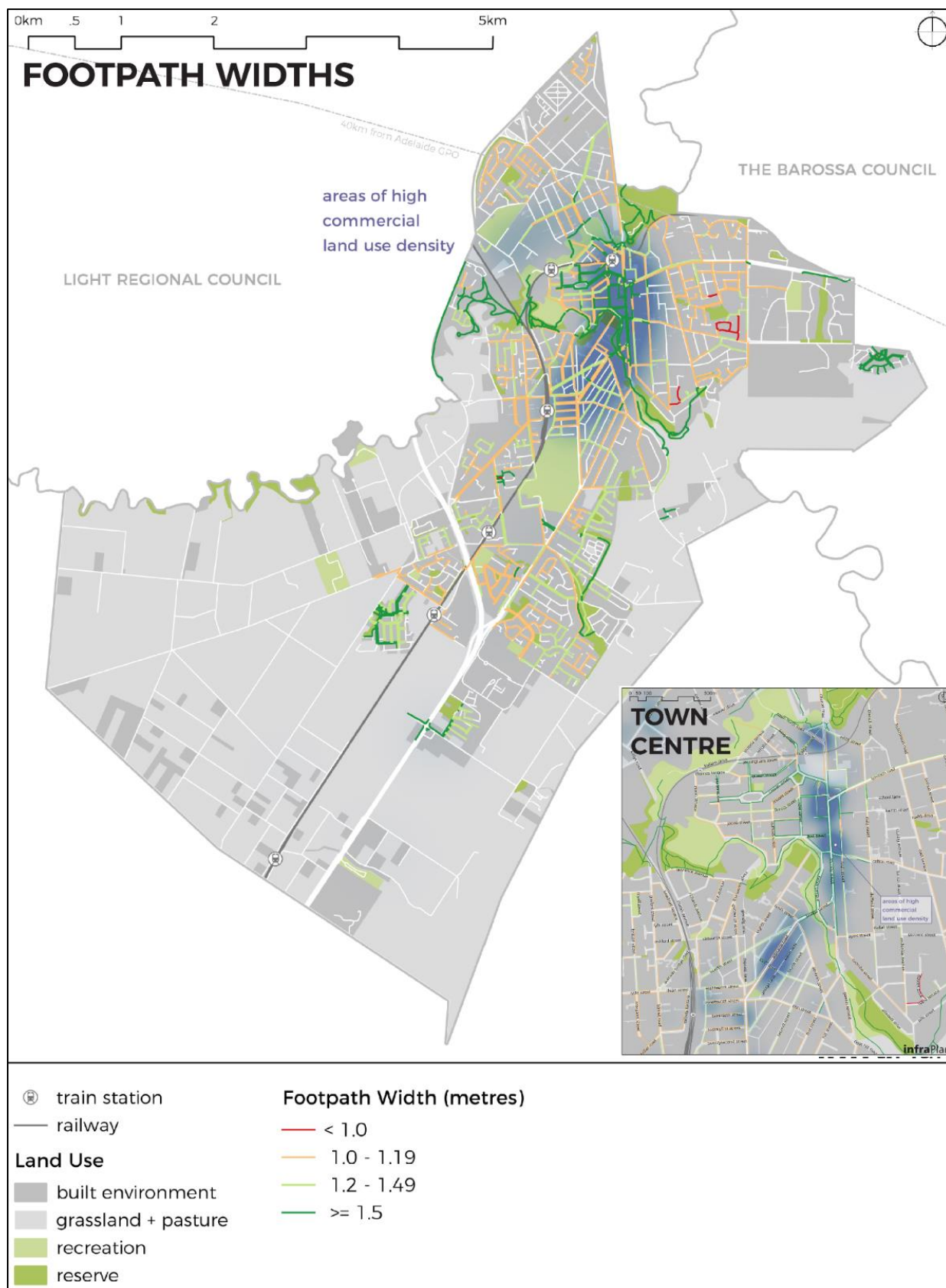


Figure 11: Existing Footpath Widths

5.3.1 Cycling on footpaths

Traditionally, the road has been for motor vehicles and the footpaths for pedestrians, leaving no space for people to ride a bike. In 2015, amendments to the South Australian Road Traffic Regulations have made it lawful for people of all ages to ride on footpaths, unless a sign prohibits cyclists from doing so.

This amendment 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 would otherwise feel intimidated by traffic. Fast and confident cyclists are less likely to use footpaths, except in particularly hazardous situations.

While these amendments significantly enhance the flexibility of cycling journeys, there are rules that cyclists must follow when riding on footpaths. This includes keeping to the left where possible, giving way to pedestrians and other footpath users and warning other users with a bell to avoid danger. There are often concerns that there will be conflict between cyclists and pedestrians, particularly the elderly, hearing impaired and/or fragile pedestrians who feel intimidated by a cyclist approaching.

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. However, these changes make footpath provision and maintenance important. Footpaths can be converted into shared paths with widening, which should be a consideration in key locations that may have high cycling demand but a lack of space for infrastructure.

5.4 The BikeDirect Network

Figure 13 illustrates the current BikeDirect cycling network in the Town of Gawler and its surrounds. BikeDirect identifies a strategic network of connected bicycle routes across the Adelaide metropolitan region, administered by the State Government. A majority of these routes (those displayed in solid coloured lines) do not provide any cycling infrastructure, resulting in cyclists sharing the road space with (often busy) vehicular traffic.

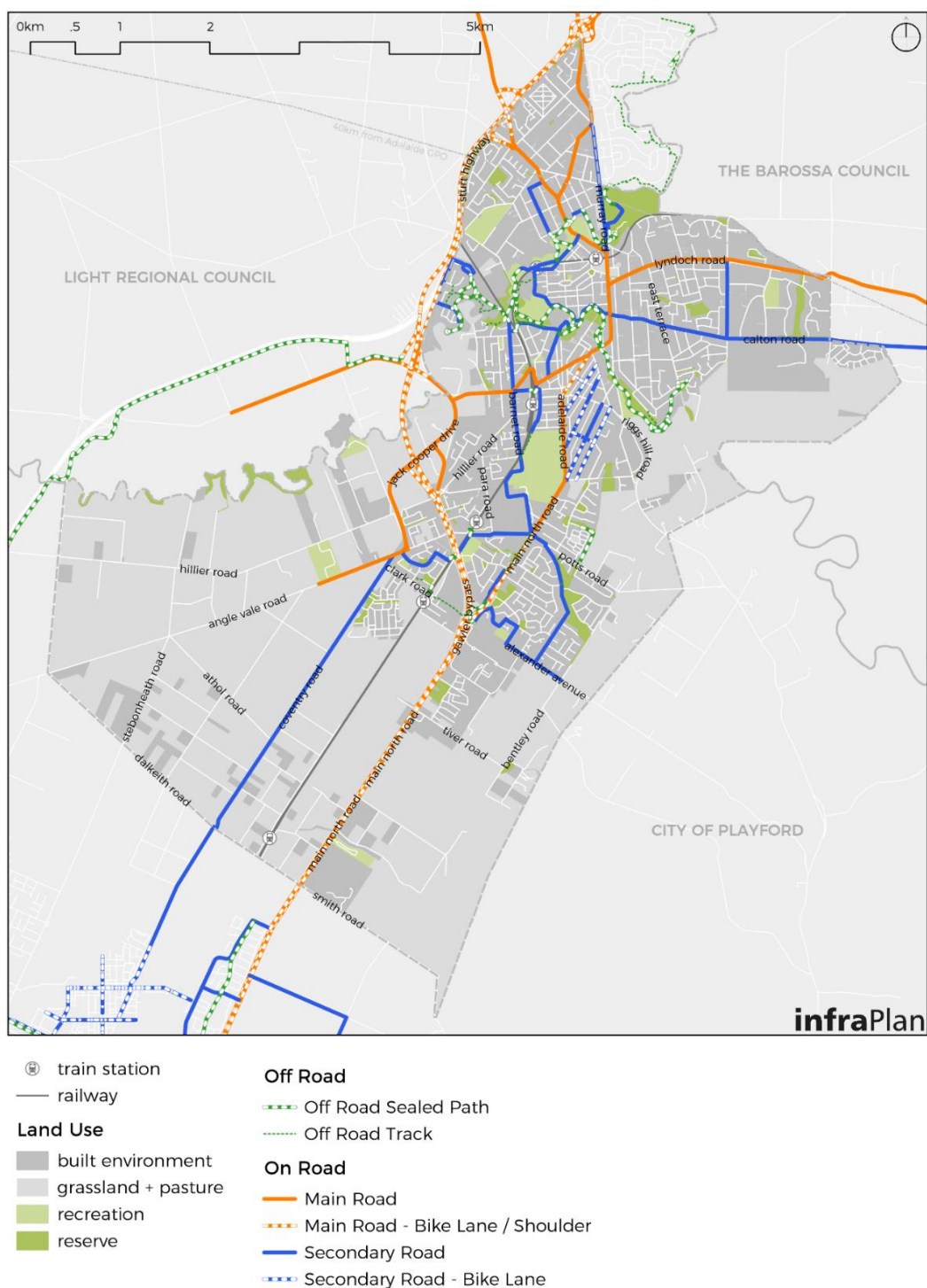


Figure 13: Existing BikeDirect Network - Town of Gawler and Surrounds

5.5 Safety and the Road Network

While cyclists have the same rights and responsibilities as other road users, they are more vulnerable when travelling on the road. Both cyclists and motorists need to consider each other and share the road safely. Motorists are legally required to leave a one metre gap when overtaking cyclists on a roadway with a speed limit of 60km/h or less, and a 1.5m gap when the speed limit is more than 60km/h.

Traffic speeds and volumes are two core factors that impact on the safety for vulnerable road users such as pedestrians and cyclists. Streets with less traffic and slower speeds move at a human pace and contribute to a more enjoyable walking or cycling journey where all transport modes are balanced. Where possible, the on-street walking and cycling networks should coincide with these safer and more enjoyable street environments.

The traffic data available for the Town of Gawler was reviewed to assess which roads are appropriate for inclusion in the cycling network, in terms of traffic speeds and volumes. This process identified the roads that would require separation and the roads that are suitable for cyclists to share with traffic. In summary, all DPTI arterial roads require separation, as well as the following Council roads: Julian Terrace, Reid Street, Calton Road, Para Road and Dawsons Road.

5.5.1 Traffic Data: speeds and volumes

An examination of the Average Annual Daily Traffic (AADT) and speed zone data for State and Council road networks was undertaken and summarised below (refer to Appendix D for visual representation).

DPTI Road Network

- The Main North Road corridor south of Redbanks Road comprising Main North Road, Murray Street, Bridge Street, Adelaide Road, Main North Road south, north of Gawler Bypass, is the most heavily trafficked corridor with current AADT volumes ranging from 15,700-22,000 vehicles per day (vpd) and speed zones ranging from 50-60km/hr;
- Lyndoch Road and Main North Road north of Redbanks Road (Horrocks Hwy) are the second most heavily trafficked with current AADT volumes of 13,700 vpd and 10,800 vpd with a speed zone of 50Km/hr;
- The Jack Cooper Drive, Ryde Street, OverWay Bridge Road, Twelfth Street corridor is the third most heavily trafficked corridor with current AADT volumes ranging from 6500-10700Vpd and speed zones of 80km/hr on Jack Cooper Drive;
- The Redbanks Road/Mallala Road corridor has a current AADT volume ranging from 7800-9200vpd with a speed zone of 50km/hr;
- Angle Vale Road has a current AADT volume of 3900vpd with a speed zone of 80km/hr west of Karbeethan Reserve and 60km/hr east.

These State owned and maintained roads are arterial roads that generally carry the highest volume of vehicles throughout the Council Area. They are direct routes without practical low-volume alternatives and therefore appropriate infrastructure is of utmost importance for the safety of pedestrians and cyclists.

Council Road Network

Calton Road (4200-6350 vpd), and the Julian Terrace/Whitelaw Terrace /Reid Street/Light Square corridor (7400-14,800 vpd) are the most heavily trafficked local streets. In addition, Calton Road has a speed zone of 80km/hr east of Sunnydale Road, and the Julian Terrace/Whitelaw Terrace /Reid Street/Light Square corridor is a heavy vehicle bypass of Murray Street. Speed zones on the non-developed sections of Coventry Road, Stebonheath Road, Hillier Road and Dalkeith are 80km/hr. Other Council roads with considerable traffic volumes are:

- Para Road east-3320vpd;
- Dawson Road-2530vpd;
- Coventry Road north /Clarke Road-1570-1830vpd;
- Potts Road-2100vpd;
- Hillier Road east -2180vpd;
- Paxton Street-2850vpd;
- Haines Road-2130vpd;
- Dawkins Avenue-1550vpd;
- Murray Street-1720vpd.

5.5.2 Pedestrian and Cyclist Collisions

To help identify specific hazardous locations, pedestrian and cyclist collision data for the period 2010-2016 (from DPTI) has been examined. Collision locations are shown in Figure 14 and Figure 15 and key findings are discussed below:

- A total of 18 accidents involving collisions between vehicles and pedestrians were reported in the 6-year period as shown in Figure 14;
- A total of 25 accidents involving collisions between vehicles and cyclists were reported in the 6-year period as shown in Figure 15;
- The majority of accidents were at intersections;
- Accidents were predominantly on the DPTI arterial road network suggesting exposure to higher vehicle volume and speed is a key risk factor; and
- A total of seven pedestrian accidents and seven cyclist accidents were reported on the local road network.

Pedestrian Crash Locations

Murray Street and Bridge Street between Main North Road and Adelaide Road has the highest accident rate for pedestrians given increased pedestrian activity levels within the town centre precinct. Pedestrian safety in this area should be a high priority. Other sites recording significant numbers of pedestrian accidents include at the Todd Street/Whitelaw Terrace/Reid Street roundabout, a heavy vehicle moderate volume route just west of the town centre precinct.

A total of 3 serious pedestrian injuries were recorded over the 6-year period. A serious injury was noted on Julian Terrace North of Bridge Street where traffic volumes are high. The pedestrian actuated crossing on Adelaide Road just south of Potts Road also recorded one serious injury involving a pedestrian, with inattention being recorded as the probable cause in police reports. A serious

pedestrian injury was also recorded on the Adelaide Road exit ramp at the Gawler Bypass interchange adjacent to Trinity College, suggesting a pedestrian was not using the grade separated crossing.

Cyclist Crash Locations

Adelaide Road has the highest accident rate for cyclists, most notably at the roundabout at Sixth Street and junction at Twelfth Street, possibly related to squeeze points at these intersections. Murray Street and Bridge Street between Main North Road and Adelaide Road has the second highest accident rate. Three cyclist accidents were reported on Main North Road north of Murray Street and on Barossa Valley Way west of Union Street at uncontrolled T Junctions. Calton Road also had three reported cyclist accidents at the High Street and East Terrace intersections where limited sight distance a steep gradient and moderate vehicle traffic volumes are possible risk factors.

Two serious cyclist injuries were recorded at the Todd Street/Whitelaw Terrace/Reid Street roundabout, a heavy vehicle route used to bypass the town centre.

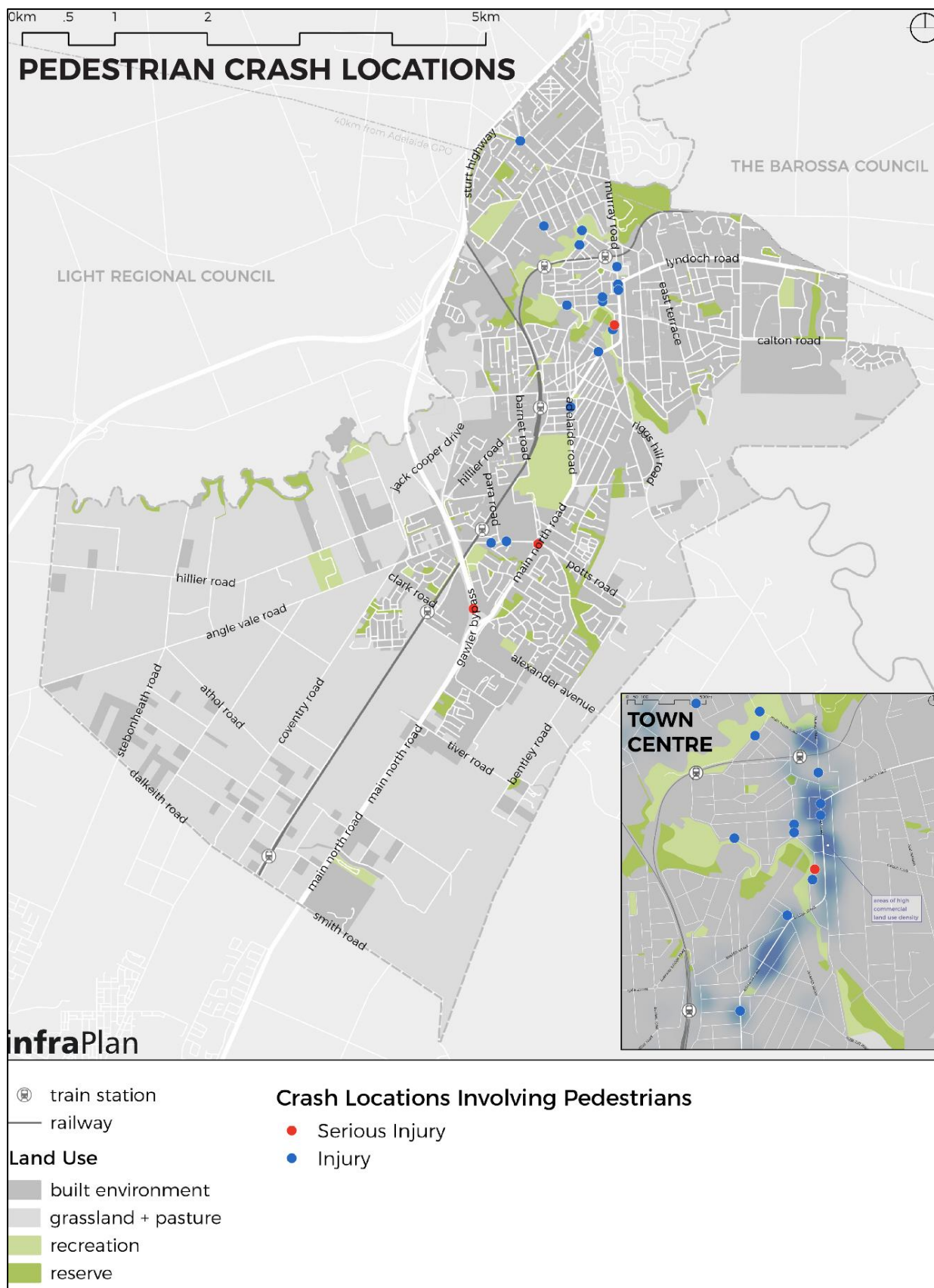


Figure 14: Crash locations involving pedestrians (2010-2016)

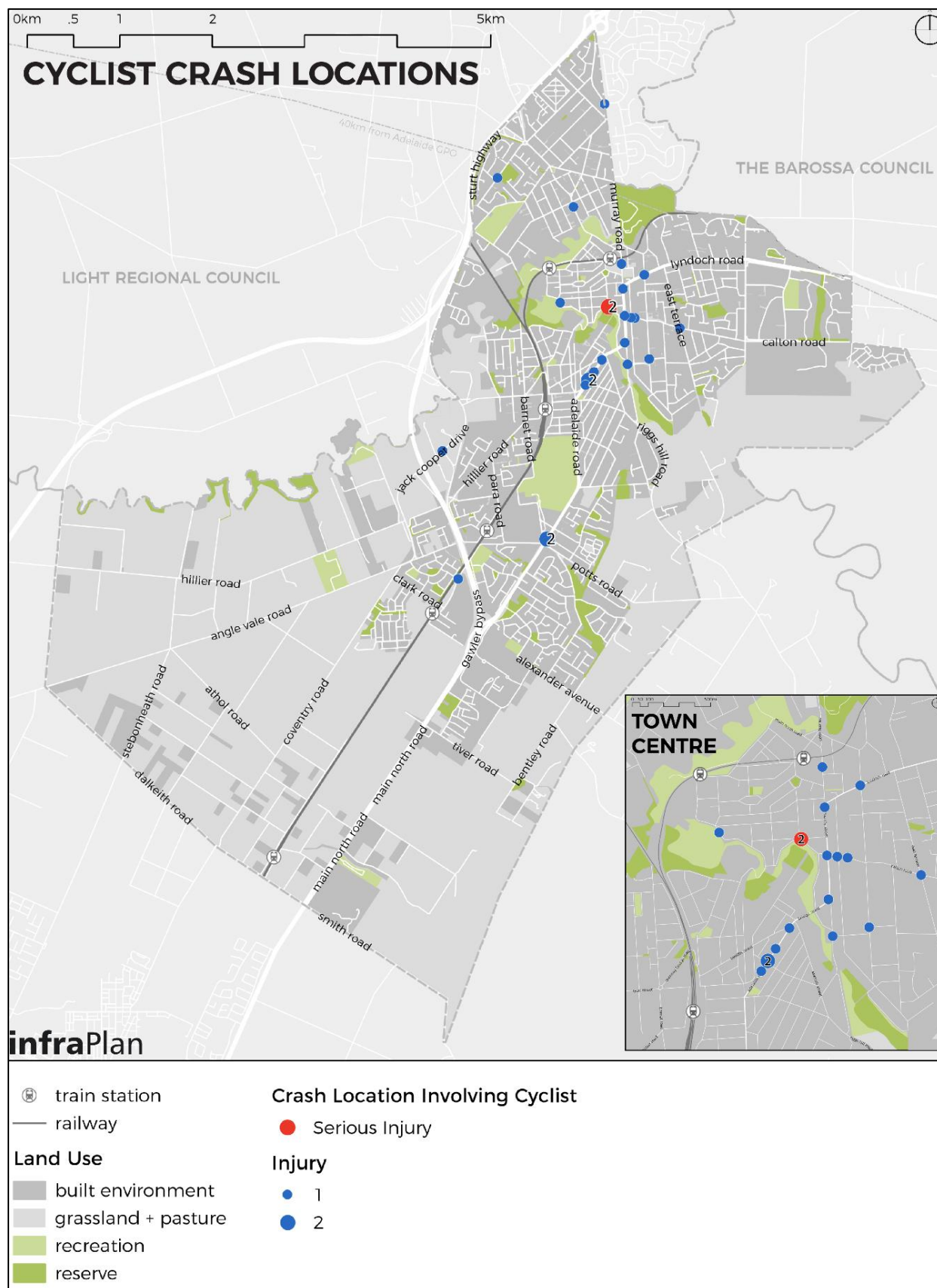


Figure 15: Crash locations involving cyclists (2010-2016)

5.6 Tourism and Regional Routes

Although not currently actualised, Gawler is well-placed to capitalise on both recent and planned major walking and cycling projects across the broader region. These include the Jack Bobridge Bikeway (Barossa to Gawler), the Stuart O’Grady Bikeway, the Gawler Greenway and the Town of Gawler’s Visitor Information Centre Bike Hub.

5.6.1 The Jack Bobridge Bikeway

The Jack Bobridge track involves 40km of shared path, connecting Angaston to East Gawler through a number of Barossa Valley townships and wineries. Currently the shared path network terminates 1.3km short of Councils eastern boundary near Sunnydale Drive.

Connections to the Gawler Town Centre are required as currently cyclists directed along either Calton road or Barossa Valley Way/Lyndoch Road (two high volume roadways without cycling infrastructure) to access the town centre. Council should liaise with The Barossa Council to update these maps in the Barossa by Bike Brochure to reflect a safer connection to the Information Centre – to be determined as part of this Walking and Cycling Plan.



Figure 16: From Barossa by Bike Brochure

“Gawler is the final destination on the Jack Bobridge Track, where heritage charm meets contemporary conveniences to create a thriving retail and commercial centre. An extensive linear path follows Gawler’s natural river corridor, and a short distance away is the Northern Expressway and Stuart O’Grady Veloway to Adelaide. Gawler Railway Station is the terminus of the Jack Bobridge Track”. – Barossa by Bike Brochure

Concordia Land Management have proposed an off-road route shared path extension within its future development. Although this section of the Bikeway does not fall within the Town of Gawler, it will ultimately link the Gawler Township to the Barossa via an off-road path. The date for construction is not known, however it is recommended that the Town of Gawler liaise with The Barossa Council and Concordia Land Management to ensure that it links into the Gawler Walking and Cycling Network and provides connections from the existing Jack Bobridge Way.

5.6.2 The Stuart O'Grady Bikeway



Figure 17: Entry point to the Stuart O'Grady Bikeway (Weaver Road / Two Wells Road)

The Stuart O'Grady Bikeway is a 23km shared path following the eastern boundary of the Northern Expressway. The bikeway currently extends from the corner of Two Wells Road and Weaver Road, just outside of the Town of Gawler, to the junction of the Northern Expressway and Port Wakefield Road. The proposed extension of the bikeway as part of the DPTI Northern Connector construction will see the shared path extend 16km to the Salisbury Highway Junction.

5.6.3 The Gawler Greenway



Figure 18: The Proposed Gawler Greenway Route (from DPTI website)

The Gawler Greenway is a long-term vision by the State Government for a cycling route and improved access to public transport extending from the Adelaide CBD to Gawler. The alignment typically follows the Gawler railway line.

The route is substantially completed between Regency Road and the Adelaide Parklands (to North Adelaide Station) and connects to the Adelaide Railway Station via bike lanes on War Memorial Drive. When completed, the Greenway will link into several key cycling routes including the Dry Creek Trail, Little Para River Trail, Jack Bobridge Track and the Stuart O'Grady Bikeway.

Works to complete the remaining sections of the Greenway are not currently planned by DPTI. However, the proposed route forms part of the Gawler Walking and Cycling Network and Council can commence sections as required.

5.6.4 Gawler Bike Hub



Figure 19: A Bike Hub in the UK

The Town of Gawler have recently completed a Bicycle Hub at the Visitor Information Centre, Pioneer Park. The Hub provides maps, information, bicycle hire, repair stations and showers. This will further position Gawler as an ideal stopover or resting point for Bikeway users seeking shopping, meals, accommodation and other activities. In addition, the bike hire facility will encourage day trips around the Town of Gawler for both residents and visitors. Electric bikes should be investigated as part of the bike hire facility given the topography of the Town of Gawler. This would act as a point of difference for the township and enhance their cycling tourism potential for people of all ages and abilities.

5.6.5 Cycling Tourism Potential

As the Town of Gawler acts as a gateway to a number of regional cycling routes, it is well positioned to capitalise on the visitors these attract.

A Cycle Tourism strategy for the Town of Gawler has the potential to contribute significantly to Council's tourism development. The strategy should consider how Council can interact with and leverage the following:

- Council's shared path network and proposed strategic cycling connections.
- Active town precinct – the bicycle hub adjacent to Gawler's Pioneer Park.
- Gawler Visitor Information Centre.
- Gawler Business Development Group
- Regional Development Australia (Barossa).



P/A

MRS FAIRWEATHER
Coffee

Recycled & Restored
COFFEE MACHINE

LOCALLY ROASTED

House Blend & Single origin coffee

Mrs Fairweather
BICYCLE EMPLOYMENT

COURTYARD

BIKES

Function
AREAS & MENU

MENU WITH A
TWIST

LOCAL WINE LIST

RESIDENT CHEF



FAIR WEATHER
SMALL BATCH

PEACH HAM STEW \$5

TOMATO SOUP \$5

BOOBY KILL \$2

6. STAKEHOLDER AND COMMUNITY ENGAGEMENT

6.1 Stakeholder Workshops

The success of the Gawler Walking and Cycling Plan 2018-2028 relies on understanding the issues and opportunities within the current network from a user perspective, as well as its alignment with Councils strategic vision. A strong sense of ownership by key user groups and stakeholders is also essential to ensure that the network is safe, continuous and legible.

Two workshops were undertaken by the Town of Gawler, InfraPlan and Civil & Environmental Solutions which presented key findings to date and reviewed the issues and opportunities identified from the site visits. Both workshops were held at the Gawler Administration Centre on 14 July.

The first workshop involved representatives of the following stakeholders:

- Town of Gawler Council Staff;
- City of Playford Council;
- Light Regional Council;
- Barossa Council; and
- Barossa Regional Development Agency.

The second workshop involved the following key user groups:

- Town of Gawler Council Staff;
- Gawler Wheelers;
- Heart Foundation Walking Group;
- Gawler Bushwalkers; and
- Bicycle Institute of South Australia (BISA)

Both workshops followed a similar agenda which opened with a presentation of the findings to date including a demographic comparison, implementation of the 2008 plan, traffic and safety data as well as the preliminary issues and opportunities as identified on site visits. This was followed by a collaborative workshop intending to draw upon participants local knowledge and interests to assist with the identification of key issues and opportunities to address in the 2018 Plan.

Some reoccurring themes outlined by workshop participants included:

- There is a lack of wayfinding throughout the township;
- The Jack Bobridge trail terminates near the eastern Council boundary – connections are required into the Town Centre and the Bike Hub;
- The Stuart O’Grady bikeway is difficult to access and needs to be linked to existing shared path network;
- There is a lack of cycling facilities to, from and around schools;
- There is lack of footpath connectivity and various unsafe intersections around Gawler Green and Gawler District School Precinct (Tulloch & Barneet Roads);
- Access to Trinity College is difficult and hazardous – particularly across Main North Road/Gawler Bypass;
- Lack of permeability across rail corridor between Reid and Willaston;

- Preparation is underway for increase in cycling tourism – including cycling hub and end of trip facilities;
- Gawler Greenway development - should be completed in conjunction with rail electrification; and
- Access to train stations is confusing and difficult.



Figure 20: Stakeholder Workshop Photos

6.2 Elected Members Workshop

An Issues Paper was prepared that included all findings and analysis to inform the Draft Walking and Cycling Network, 2018-2028. This was presented to Elected Members in September, with feedback shaping the Draft Report for Consultation.

6.3 Community Consultation

Community consultation for the Town of Gawler Walking and Cycling Plan was undertaken by Council in March and April, 2018. It was conducted in two distinct phases, 1) general consultation, and 2) consultation with local school students.

6.3.1 General Consultation

The Draft Cycling and Walking Plan was available online via Councils 'Your Voice' website, and hard copies were made available at the Gawler Administration Centre, Gawler Sport and Community Centre and Evanston Gardens Community Centre. This consultation process and request for feedback was advertised via Councils Facebook and Twitter pages and the Gawler Bunyip local newspaper.

No feedback was received by Council for this phase.

6.3.2 Schools Consultation

Consultation was undertaken with students from seven schools across the Town of Gawler. This included Gawler District School, Xavier College, St Bridges Catholic School, Immanuel Lutheran School, Gawler East Primary School, Gawler Primary School and Trinity College. The consultation was conducted over 3 days and involved 764 students from years 6 to 12. In addition to the Walking and Cycling Plan, the consultation also sought feedback on:

- Youth Development Plan review
- Biodiversity Management Plan
- Open Space Guidelines
- Gawler Natural Management Centre

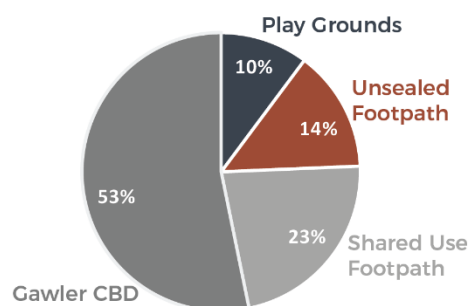
For the Walking and Cycling Plan, Students were divided into small groups of 10 to 20, where the purpose of the plan and consultation process was explained and future walking and cycling routes were discussed using a map for reference. The students were asked five simple questions regarding their current walking and cycling behaviours. These included:

- What are the main attractions you walk or ride to?
- What path do you walk or ride on?
- How do you use the footpath?
- How often do you walk or ride per week?
- If footpaths were improved, would you walk/ride more often?

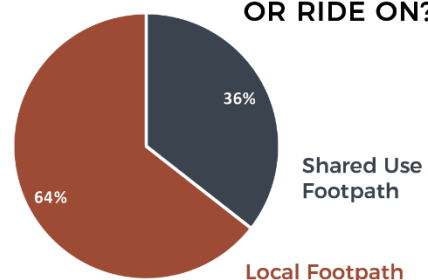
The responses to these questions are illustrated in Figure 21 and are summarised below.

- Half of the respondents walk and the other half use wheels (bicycle or scooter)
- 89% of students walk or ride one or more days per week
- Students mostly like to walk and/or ride to the Gawler CBD
- Students walk and/or ride on footpaths and shared use paths. If footpaths were improved, 72% of students would walk or ride more often.

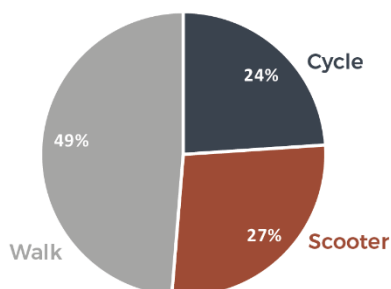
WHAT ARE THE MAIN ATTRACTIONS YOU WALK OR RIDE TO?



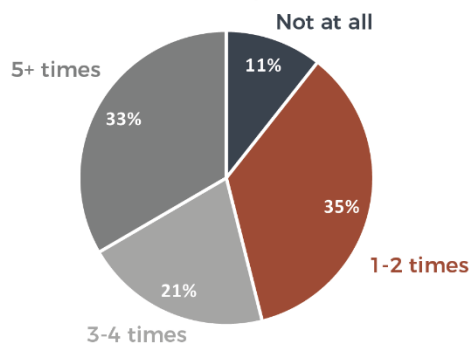
WHAT PATH DO YOU WALK OR RIDE ON?



HOW DO YOU USE THE FOOTPATH?



HOW OFTEN DO YOU WALK OR RIDE PER WEEK?



IF FOOTPATHS WERE IMPROVED, WOULD YOU WALK/RIDE MORE OFTEN?

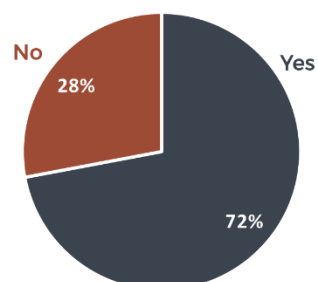


Figure 21: Schools Consultation



7. PLANNING THE WALKING AND CYCLING NETWORK

Street design has long been focussed around motorised transportation. This has resulted in an imbalance in our streets, where cyclists and pedestrians are often squeezed out. Streets are an integral component in the urban landscape, they are not just isolated corridors to move cars as quickly as possible; they are places for people.



Figure 22: From the "Streets for People" Compendium

7.1 Planning for Pedestrians

7.1.1 Types of cyclists

There is not an average pedestrian, facilities must be designed to accommodate people of all ages and abilities. Pedestrians include young children, seniors, people wheeling prams, wheelchair users (battery or motorised), runners/joggers, people with a vision, hearing or cognitive impairment, skaters, and people with limited walking ability or an injury. Designing universally for people with a disability is beneficial for the enjoyment, amenity and safety of all pedestrians.

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 is required further afield.

Seniors

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

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

in the same way that people without a disability can. 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 benefits 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; and
- Monitor and Maintain.

7.1.2 Walking Infrastructure and Facilities

The walking network needs to provide convenient links between destinations and neighbourhoods along the safest and most pleasant routes. Generous footpath widths, safe road crossings at desire lines, regular seating, lighting and attractive landscaping all contribute to an active, vibrant and healthy town environment. The walking network should connect people with shops, schools, train stations, bus stops, recreational facilities, the river corridors and other neighbourhoods.

The Town of Gawler walking network needs to effectively integrate safe and enjoyable walking facilities along and across roads and trails to form a continuous network. 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, 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;
- 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; and
- Adequate lighting.

Footpath provision

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 for expected pedestrian volumes and reflect adjacent land uses. The table below provides 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.

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)	1.0m absolute minimum at a squeeze point. Clear width required for one wheelchair.
Low pedestrian demand	1.2m -1.5m	1.0m absolute minimum at a squeeze point. 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 a wheelchair and a pram 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.



Figure 23: 1.5m wide footpath (Wells Pl, Evanston Gardens)



Figure 24: Wide footpath, Murray Street

7.2 Planning for Cyclists

Cycling related research and the design of cyclist infrastructure has been rapidly evolving, with surveys Australia-wide showing that feeling unsafe due to traffic speeds and volumes is a key reason for lack of cycling uptake. 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.

7.2.1 Types of cyclists

Cyclists have different levels of confidence and capabilities and will choose to cycle for different purposes. Individuals may choose to cycle for transport or recreation, and at differing levels of intensity as displayed in Figure 25. A good cycling network caters for the differing purposes of a cycling trip and varying skill levels.



Figure 25: Types of Cycling and Cyclists

7.2.2 Cyclist Infrastructure and Facilities

A Design Toolkit is provided in Appendix E, which provides detail on the various types of infrastructure that can be adopted.

The cycling network for the Town of Gawler is identified to be on local roads where possible and if on busy roads, provides stronger separation between vehicles and cyclists. The network is seamless, with safe road crossing points at logical locations (refuges or signals), and supporting infrastructure such as bicycle parking and wayfinding signage is provided at appropriate locations.

Cyclist facility	Traffic volume (vehicles per day)			85 th percentile Traffic Speed (km/h)		
	<3000	3000-5000	>5000	<40	40-50	>50
Mixed traffic (Sharrows)	✓			✓		
Consider separation (off-road or bike Lanes)		✓			✓	
Separation (off-road or enhanced bike lanes)			✓			✓

The 2018-2028 cycling network includes the following key infrastructure components:

Greenways & Shared Paths



These are off-road routes that are used for commuting as well as recreation and are therefore highly trafficked by pedestrians and cyclists. They include shared paths along the river and rail corridors, and links where possible within the road verge. These paths create a safe off-road backbone for the Town of Gawler's Walking and Cycling Network.

Local Road Bikeways



These routes are located on residential, low-traffic streets, where Shared Lane Marking (Sharrows) is all that is required to direct cyclists along the route and indicate to motorists that it is a cyclist street. Sharrows assist cyclists with lateral positioning and wayfinding, and alert motorists that they are on a designated cyclist route. This treatment is recommended on routes where traffic volumes are less than 3,000 vehicles per day and traffic speeds are 50km/h or less.

Main Road Routes

These include the arterial roads maintained by DPTI. Although not preferred by cyclists due to their high traffic volume and speed, there is often no alternative route. Bicycle Lanes, Enhanced Bicycle Lanes, Protected Bicycle Lanes, Sealed Shoulders or off-road paths are required to separate vehicles and cyclists. The degree of separation generally dependant of traffic speed, volume (as per Austroads Guidance - refer to Design Toolkit, Appendix E). Currently these routes consist of sealed shoulders which give cyclists some degree of separation on parts of Main North Road, Adelaide Road, Gawler Bypass and the Sturt Highway.



Figure 26: Enhanced Bike Lane



Figure 27: Protected Lanes



Figure 28: Sealed Shoulders



Figure 29: Cycle path in verge

Road Crossings

Where a route on the cycling network crosses a road with more than 5,000 vehicles per day, safe crossing infrastructure is recommended. This can be in the form of a cyclist refuge, signalised intersection or pedestrian actuated crossing (as per Austroads Guidance - refer to Design Toolkit, Appendix E). Figure 30 illustrates a typical central median refuge and Figure 31 illustrates a concept where a staggered Local Road Bikeway crosses a busy road.

A cyclist refuge provides a protected space for cyclists to wait before crossing a road. They can be on the left side of the road to provide a waiting space before crossing a road or in a central median to enable a busy road crossing to be undertaken in two stages.



Figure 30: Typical Median Refuge

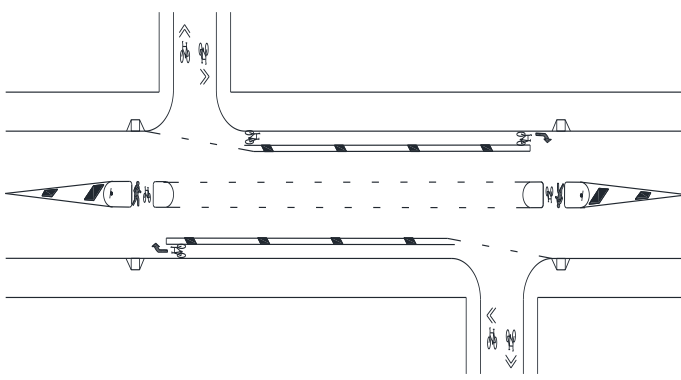


Figure 31: Median refuges at staggered local road bikeway

Safety at roundabouts

Roundabouts are a relatively safe form of intersection for motorists, but result in a higher rate of crashes for cyclists. 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. Serious cyclist collisions have occurred at the roundabouts at Redbanks Road / Dawkins Avenue / Weyland Road and Tod St / Whitelaw Terrace / Reid Street and these should be assessed in detail for safety improvements.

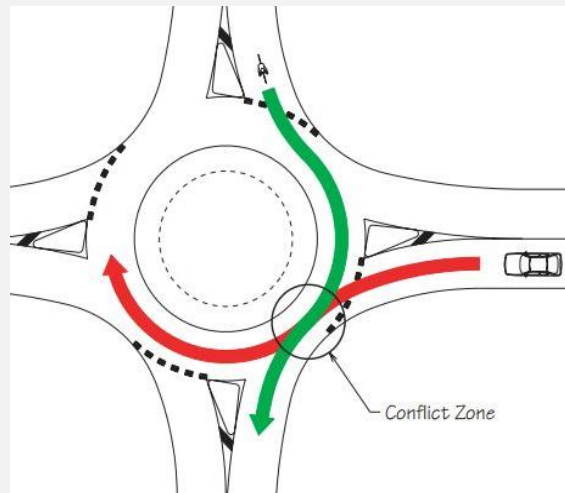


Figure 32: Cyclist and vehicle conflict zone at a roundabout.

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 day time activity. It must be realised that cycling journeys will be made after dark, particularly during the winter months when daylight hours are reduced. It is recommended that all off-road paths be assessed for the need for lighting and rolled out strategically, starting in high-use areas.

Bicycle Parking

Safe and secure bicycle parking is required that is appropriate to the land use. Rails for short-term parking can be out in the open, near the entrance to the destination and in an area of passive surveillance. Longer-term parking for students and employees should be preferably under-cover and provided in a more secure location.



Figure 33: Bicycle parking rails (short-term parking)



Figure 34: Bicycle cage (long-term parking)



Figure 35: Typical bicycle pod (parking and additional facilities)

Signage

Wayfinding signs and pavement stickers are discussed in Section 8.5 and Section 9.2. Other signs that are required are Regulatory Signs in accordance with Australian Standards, along Bicycle Lanes and Shared Paths, see images below.



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, high rotation maintenance schedule of cleaning leaf debris on shared paths and promoting shared path-user etiquette.



8. THE WALKING AND CYCLING NETWORKS 2018-2028

The long-term (ultimate) walking and cycling network is illustrated in Figure 47. This is the long-term vision for walking and cycling in Gawler and seeks to address all issues and barriers identified in the plan. To achieve this long-term vision, priority works have been recommended for implementation within the next ten years (priority projects) are illustrated on Figure 46. Indicative costings and timing are provided in the 10 Year Action Plan (Section 11).

The key projects listed in the Action Plan are described below.

8.1 Connect the Jack Bobridge Bikeway into Gawler Township and the Bike Hub

Completing this route and providing a seamless connection from the Visitor Centre and Bike Hub to the popular Jack Bobridge Way requires filling in some gaps in existing cycling infrastructure. It is proposed that a local road bike route will make use of existing sharrow linemarking and cycling infrastructure recently installed in Gawler East, south of Lyndoch Road. This route will connect to a new pedestrian refuge crossing at the High Street/Barossa Valley Way T-junction, which will also be beneficial to the wider community. Liaison will be required with The Barossa Council and DPTI to link up the Jack Bobridge Bikeway to Sunnydale Avenue at the Town of Gawler boundary.

Wayfinding signage will be important for the success of this local-road route due to its meandering nature and its likely use by tourists. In the long term, it is proposed that a shared path connection is provided along the rail corridor, from the existing Jack Bobridge Shared Path to Murray Street. This route will be superior for tourism and recreation as it will be entirely off-road. However, it relies on the construction of a shared path within the Concordia Development. It is recommended that the Town of Gawler liaise with Concordia developers and The Barossa Council to ensure this is considered as a part of the development.

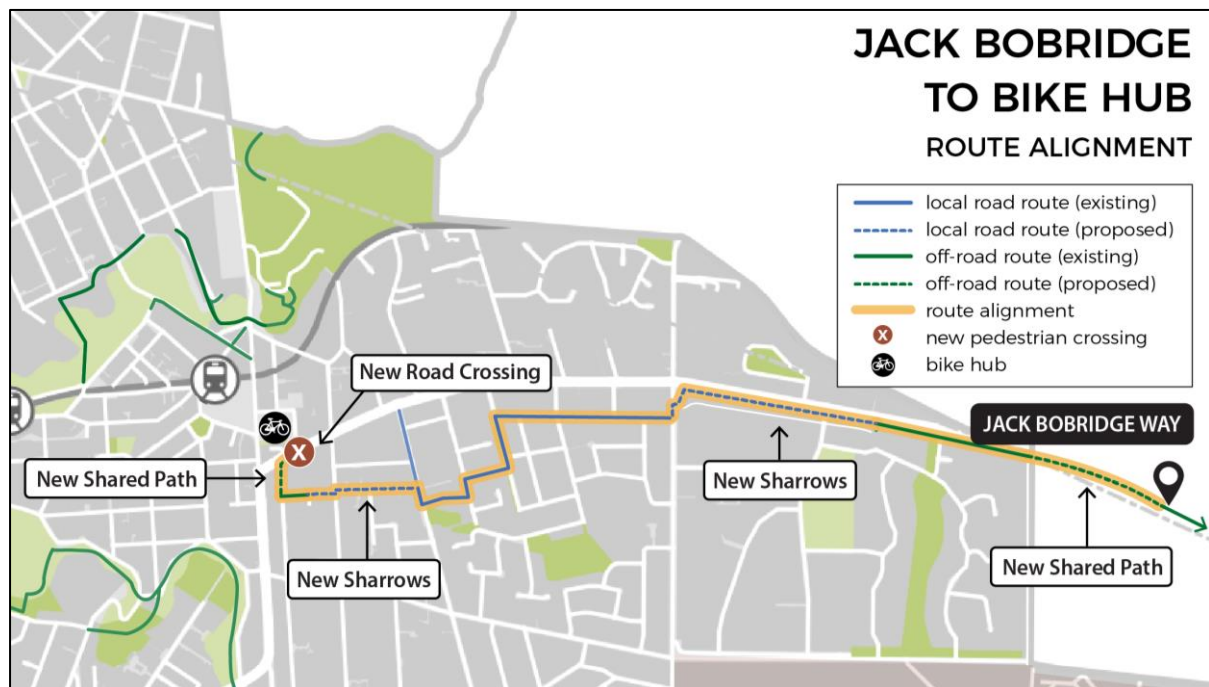


Figure 36: Jack Bobridge Way to Bike Hub Route

8.2 Connect the Stuart O'Grady Trail into Gawler Township and the Bike Hub

While there are a number of plausible route options to connect the Stuart O'Grady Bikeway to the Visitor Centre and Bike Hub, it is proposed the Town of Gawler utilises its recent investments in the Rivers Shared Path Network. The proposed route utilises the existing shared paths as much as possible and would be suitable for recreation, tourism and people who prefer off-road routes.

Like the connection to Jack Bobridge, completing this route requires filling in some minor gaps in existing cycling infrastructure. This also includes provision of a passive rail crossing on Warren Street, connecting the Clonlea Reserve path network to the Bike Hub. Again, wayfinding signage will be vital for the success of this route, particularly due to the nature of the shared path network which may often seem anti-directional.

This route also has the potential to enhance connections between Reid and Willaston, which has been identified as a priority action (see section 8.8). Council should seek to further liaise with DPTI regarding connections from Paternoster Road to Stuart O'Grady with consideration of permeability between these two localities.

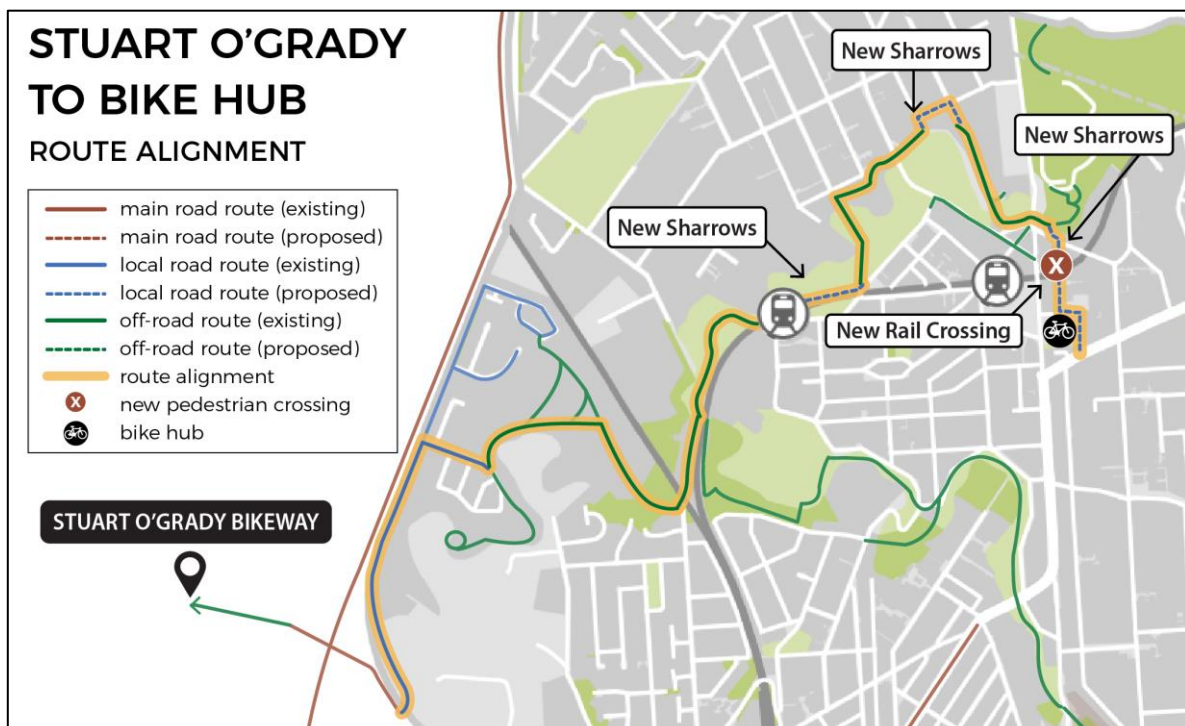


Figure 37: Stuart O'Grady Bikeway to Bike Hub route

8.3 Connect the Bike Hub to the River Shared Path Network

Direct connections to the Shared Path network are provided from the Bike Hub to Clonlea Reserve as a part of connections to regional routes. This also includes provision of a passive rail crossing on Warren Street, connecting the Clonlea Reserve path network to the Bike Hub.

8.4 Safer access to and from Schools

Some of these works are high cost items but critical in enabling students to walk or cycle to and from School at Trinity College, The Gawler and District College and Xavier College. They include traffic signals at Adelaide Road / Tulloch Road, shared path links, a refuge crossing on Main North Road (Bacton Street to Second Street) and sharrows along the local road network.

Proposed links to Xavier college are displayed in Figure 38 and will require Liaising with Light DC for co-funding. These links are vital considering the size of the school and the number of students who must commute across the busy Sturt Highway from the Town of Gawler to get to school.

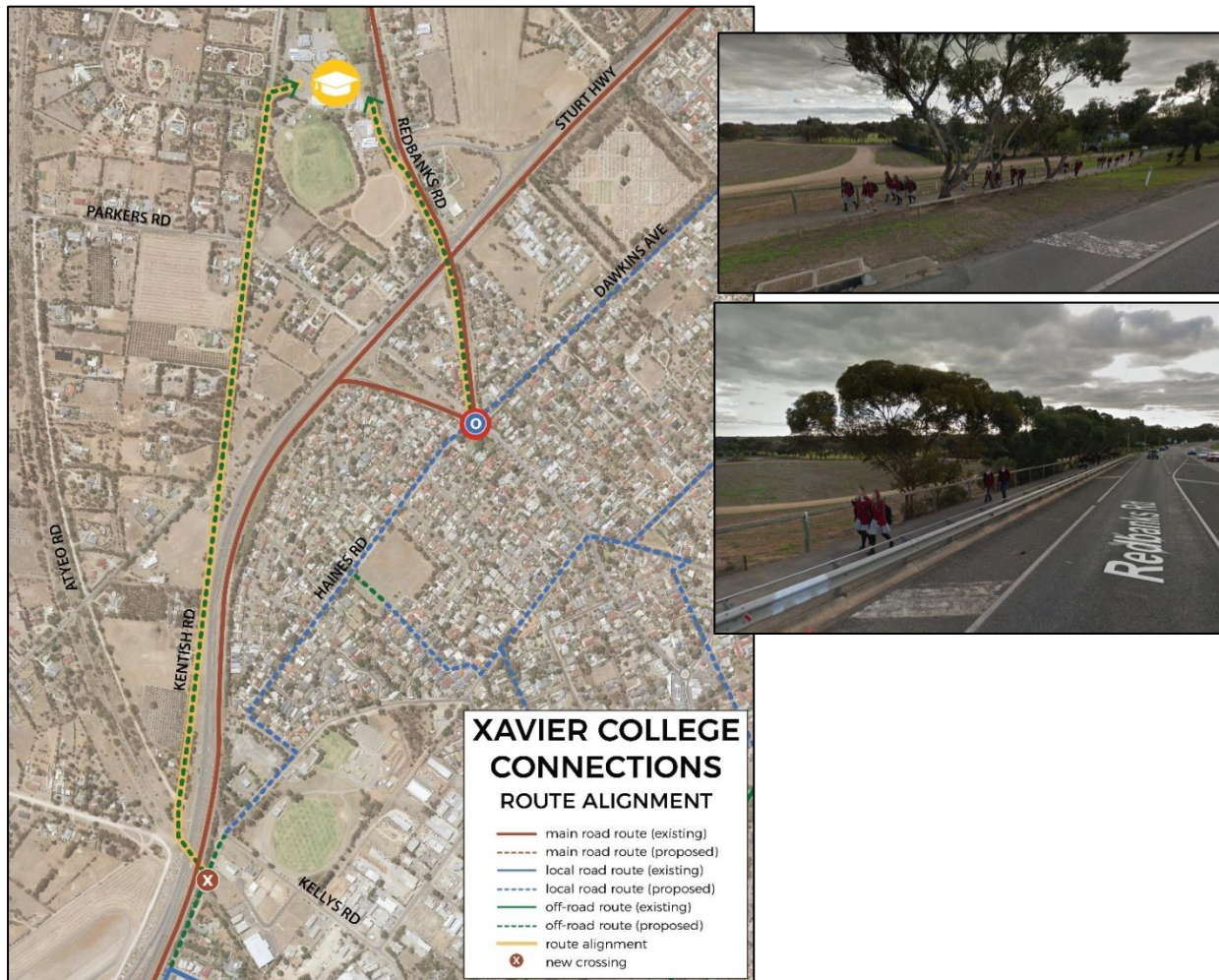


Figure 38: Xavier College proposed walking and cycling Links

Students currently access Xavier College via the Redbanks Road overpass of the Sturt Highway. While this is an important pedestrian connection, there is scope to improve the amenity and accessibility of this route by widening the narrow footpath to create a shared use pathway on the Western verge. This would provide the option for students further afield to safely cycle to school.

Other Schools will have improved access as part of other priority works, such as:

- The Jack Bobridge connection – improves access to Gawler East Primary School and Immanuel Lutheran School,
- The Stuart O’Grady connection – improves access to the Gawler Primary School, and
- Connections to new growth areas – improves access to Evanston Gardens Primary School.

From the results of consultation, it is further recommended that Council undertake a study into walkability around schools and educational precincts. This study should focus on connectivity of footpaths and crossing points and be cognisant of the safety issues surrounding unpredictable traffic movements in drop-off and pick-up hours.

8.5 Wayfinding Strategy and Map Production

A Wayfinding Strategy is recommended that will identify the cyclist and pedestrian decision points throughout the network and hence, locations for signs. Signage will be required to the Bike Hub & visitor information centre, train stations, key Bikeways, activity centres, Reserves, recreational facilities, cafes/shops, WC's, schools and any other useful destinations identified. All signs must comply with the relevant Australian Standards. The route name, destination and length in kilometres and/or minutes to major destinations is recommended as it will assist cyclists in choosing the route.

Currently a lack of wayfinding across the township may lead cyclists to busy roads such as Adelaide Road to access amenities in the Town Centre. A number of low volume, local road routes have been proposed to provide alternate options to busy roads. The success of local routes will be contingent on wayfinding signage to ensure users are aware of alternate options and know which routes will get them where they need to go. This is particularly important given the potential to capitalise on cycling tourism opportunities, where a number of users will be unfamiliar with the surrounding environment.

A walking and cycling route map of the Town of Gawler and surrounds is also required for distribution as hard copy, and should be available for download and as an interactive mobile App.



Figure 39: Basic directional signage

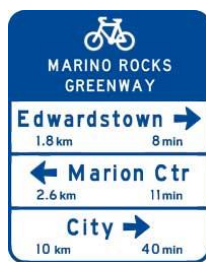


Figure 40: Directional signage, primary route,



Figure 41: Route markers



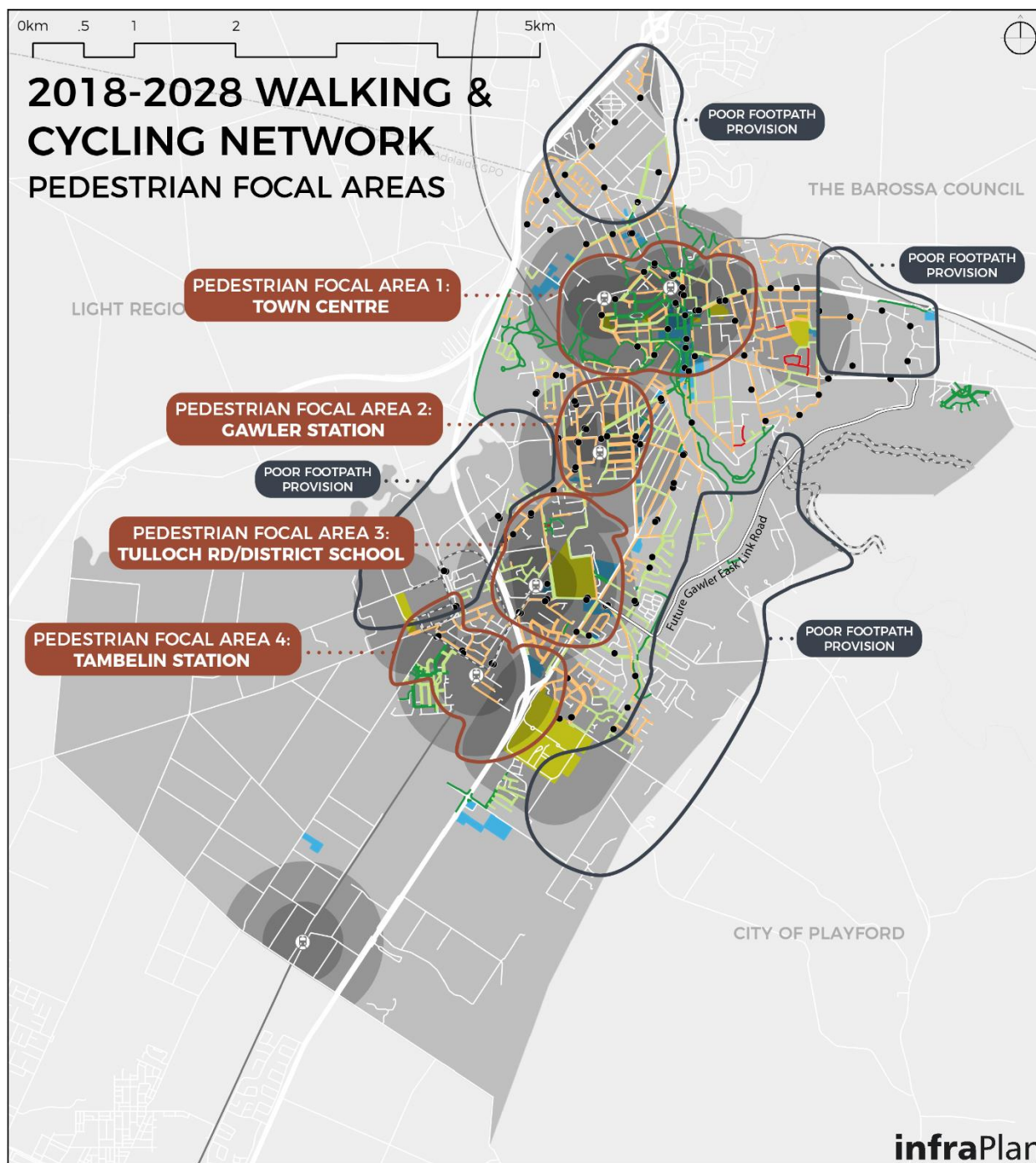
Figure 42: Typical pictograms for fingerboard signs

8.6 Town upgrade and widening of footpaths and footbridges

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 Town of Gawler's walking network 2018-2028 shown in Figure 43 (overleaf). 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. All remaining streets in the network serve a lower pedestrian demand. In addition to the footpath dimensions recommended, it is important that in particular areas additional space be provided for features such as lighting, signs, seating, outdoor dining and planting.

Additionally, three footbridges have been identified for upgrading within the next 10 years. They are in the areas where the highest pedestrian and cyclist volumes occur, and widening is required for shared use. The locations include: South Para River at Whitelaw St; South Para River at Fourteenth St; and Para River at Bright Street.



- bus stop
 - Ⓜ train station
 - railway
- Land Use**
- education
 - retail commercial

Footpath Width (metres)

- < 1.0
- 1.0 - 1.19
- 1.2 - 1.49
- >= 1.5

Future Paths

- proposed growth area links

Walking Catchments

Train Stations



Schools

400m - 5 min walk



Pedestrian demand

higher ← → lower



Figure 43: Pedestrian Focal Areas

8.6.1 Footpath upgrades – Policy and Prioritisation Tools

The peri-urban nature of the Town of Gawler makes prioritising pedestrian improvements complex. As areas of pedestrian activity are largely confined to the Town Centre, it is important that these footpaths are upgraded to appropriate widths to accommodate for increased demand. However, there are a number of low-density residential areas without any footpath provision, which will may discourage residents from walking at all.

Footpaths can be highly sensitive assets to a Council with genuine concern for providing a safe walking network, encouraging more walking and satisfying community needs. The table below identifies some typical community expectations and corresponding Council objectives.

Community Expectations	Council Objectives
High level of comfort	Appropriate Level of Service defined, measured achieved
Safe to use	Free of hazards, wide enough for shared use with cyclists, connect to safe road crossings
Functional for people using mobility aids	Comply with Australian Standards and Austroads Guidelines
Provided everywhere that I wish to walk	Prioritised construction and maintenance

Strategic prioritisation of asset management is required so that available funding is used most effectively. A prioritisation tool is required that is based on a number of factors, including: location, connectedness, pedestrian activity areas, pedestrian volumes, traffic volumes, pedestrian age profile, pedestrian types, safety and risk management.

It is recommended that council:

- develop a bespoke prioritisation tool to assist in pedestrian upgrades, and
- upgrade the current Footpath and Cycleways policy is up-to-date and ensures the community needs for pedestrian access and mobility are met in the most appropriate and efficient manner.

These could be completed in house or by a consultant, and there may be efficiencies in completing these two tasks simultaneously.

8.6.2 Footpath upgrades – pedestrian activity

Pedestrian activity areas in the Town of Gawler are generally confined to the Murray Street Town Centre precinct and surrounds, Adelaide Road and the two activity centres surrounding the Super School precinct along Main North Road. Foot traffic is also generated from the six train stations within the council area and the schools, however these would facilitate lower levels of pedestrian traffic when compared to commercial land uses.

The pedestrian focal areas displayed in Figure 43 were determined by these land uses and their appropriate walking catchments – such as 400m around schools and 400-800m around train stations (representing a 5-10-minute walk). As walking is considered a complementary mode to public transport use, safe and convenient walking links to bus stops and train stations will play an important role in encouraging residents to make more active and sustainable transport choices.

Where multiple catchment areas overlap, a heightened level of pedestrian activity is expected. This has resulted in four key pedestrian focal areas, including the Town Centre, the Gawler Station precinct, the Tulloch Road/District School precinct and the Tambelin Station precinct. These should be priority areas for any future improvements to pedestrian infrastructure within the Town of Gawler.

Pedestrian focal area 1: Town Centre Precinct

Recent pedestrian improvements in the Town of Gawler have focused on the Town Centre precinct. While most footpaths are now 1.5m or wider, there are a number of high volume walking routes - such as those linking to train stations, the Rivers shared path network and educational facilities - that have footpaths below 1.2m wide, or none at all.

This precinct is a central public transport node for the Town of Gawler, with two train stations and a dense cluster of local service bus stops. The provision of high quality walking infrastructure in this area is therefore critical for accessibility and the comfort of existing and potential public transport users.

This focal area also demonstrates a lack of permeability between the suburb of Willaston and the train stations. While the rivers shared path network improves permeability, access is not always intuitive, making wayfinding critical.

For example, Google Maps currently recommends a 1.7km walking route along the road network between Weaver Drive and Gawler Oval Station. However, as the crow flies, the station is only 270m away. This can act as a deterrent for visitors and first-time users who are unaware of the pedestrian links through the shared path network which can reduce the walking distance to 520m (refer to Figure 44). Council can inform Google of the location of shared paths throughout the Town of Gawler via the Google Map App.



Figure 44: Google maps recommended walking route does not consider existing shared paths

Pedestrian focal area 2: Gawler Station Precinct

This precinct includes the more established and historic areas of Gawler, and has generally consistent footpath provision, but they are very narrow, and often only on one side of the road. Currently, all footpaths in the area are less than 1.5 metres wide, and many are below 1.2 metres wide.

A number of train services to the Town of Gawler terminate at Gawler Station, making walking infrastructure in this area important. The retail commercial establishments along Adelaide Road further stress this importance as it should be easy for residents to walk from the train station to a local shop, and then home along a safe and seamless pedestrian network.

Pedestrian focal area 3: Tulloch Road/District School Precinct

This precinct is home to a number of recent developments such as the Gawler & District College and Gawler Green Shopping Centre. Footpath continuity in the area is currently ad-hoc due to various developer contributions that stop at the property boundary and have not been integrated or extended to meet the existing network.

The street network in this precinct has developed to accommodate bulky scale land uses - such as the schools, large shopping centres and the race course, which make pedestrian connectivity and permeability generally low. Furthermore, these land uses generate significant volumes of vehicular traffic throughout the day.

It is important that footpaths are provided at the appropriate widths (refer Section 7.1.2), on all routes between the school precinct, Evanston train station and the shopping centres. This will help ensure the safety of all school children and encourage walking, cycling and the use of public transport to get to school.

Pedestrian focal area 4: Tambelin Station Precinct

While this precinct is less developed than other pedestrian focal areas in the Town of Gawler, a demand for pedestrian connections is generated by the Tambelin train station and the two schools (Evanston Gardens Primary and Trinity College).

Trinity College is the largest school in the Town of Gawler with over 2,000 students commuting from within and outside of the council area. Therefore, connections between the school campus and Tambelin station are vital. Currently, the high speeds and volumes of traffic on Main North Road and the Gawler Bypass act as a significant barrier to students commuting to school via the train. While there is an existing underpass, it is often perceived as inaccessible and requires additional wayfinding and lighting.

Areas with poor footpath provision

There are four broadly defined areas within the Town of Gawler that currently have poor footpath provision. In these areas, a majority of streets have no footpaths, creating a poor walking environment where pedestrians are forced to share the road space with vehicular traffic. These include:

- Gawler East, North of Calton Road and East of Cheek Avenue
- Gawler South and Evanston Park, along the Eastern Council boundary

- Hillier, Buchfelde, Reid and Gawler West along Jack Cooper Drive and Two Wells Road
- Willaston, at the Northern Council boundary

These areas are generally on the outskirts of the Town of Gawler and are some distance away from train stations and existing pedestrian activity areas. Most precincts, however, are in close proximity to residential growth areas.

Any future improvements should therefore focus on connecting the proposed growth area walking networks to existing pedestrian activity precincts. Strengthening the walking environment in these areas will ensure that new and existing residents are able to comfortably walk to various destinations across the council area.

8.7 Safe road crossings and improved cyclist squeeze points

Busy roads can stop people walking if there's nowhere to cross as footpaths are only as useful as the crossings that connect them.

There are numerous road crossing improvements and assessments recommended throughout the township ranging from median refuges, roundabout upgrades to traffic signals. Many of these are on roads owned and maintained by DPTI, and therefore it is recommended that Council meet with relevant DPTI staff (Metro Traffic Operations and Infrastructure Planning Services) to discuss part funding of these projects. Locations for pedestrian crossings need to be strategically located to coincide with pedestrian desire lines, such as bus stops, walking and cycling routes, shops and destinations. Along arterial roads, crossing locations are proposed to be at a maximum of 400 metre spacings, but these should be assessed on a case-by-case basis and in discussion with DPTI.

It is recommended that all roundabouts in the Town of Gawler be assessed for safety design improvements. Of particular safety concern is, the Redbanks Road roundabout (which has sufficient space for a shared path bypass, refer Figure 45), and the Tod Street/ Whitelaw Terrace roundabout which carries higher speed traffic due to its generous carriageway widths to allow for it being a heavy vehicle bypass.

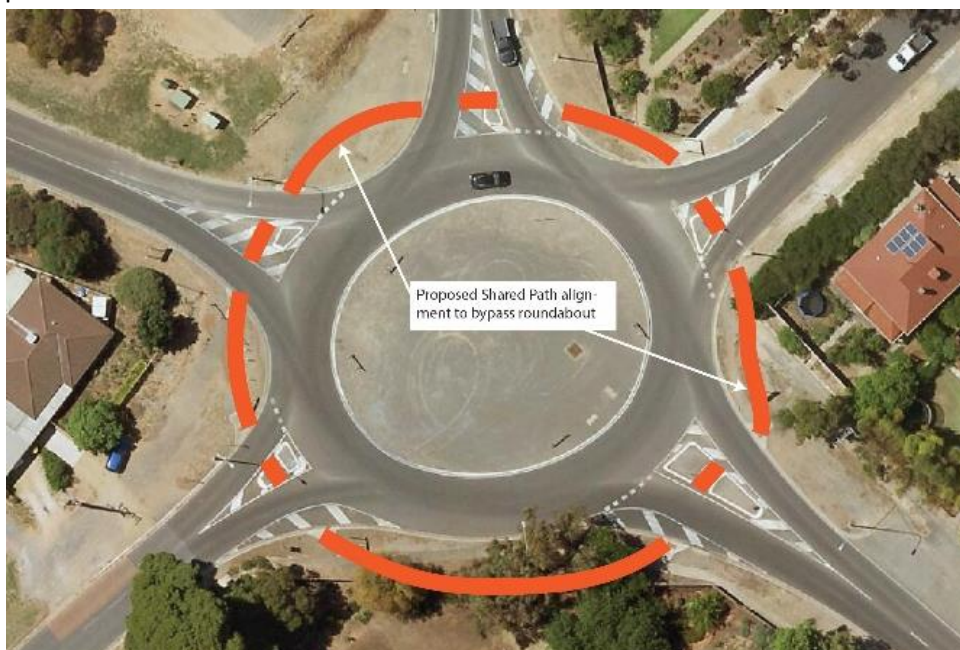


Figure 45: Concept for cyclist bypass of Redbanks Roundabout

Bridge Street South is a DPTI road that directly links Murray Street to Adelaide Road over the South Para River. It is a severe squeeze point for cyclists as the width of the bridge is narrower than the roads either side and the bicycle lanes terminate just south of the bridge. Although a high-cost item, a pedestrian/cyclist bridge is recommended adjacent to the road bridge that connects into the River Shared Path network.

8.8 Connect Reid, Willaston and Hewett

Permeability between Reid and Willaston will be improved by identifying the appropriate local road network with sharrows and wayfinding, and the provision of a link over the Roseworthy Rail Line between Patenoster and Two Wells Road. Access to the Hewett centre (Light Regional Council), will be improved with a shared path link and pedestrian refuge crossing on Main North Road.

East West connections between Willaston and Hewett (across Redbanks road and Horrocks Highway/ Main North Road) will primarily be along Haines Road and Dawkins Avenue as well as Holmes/ Princess/ Davies Streets.

A Local Area Traffic Management Plan (LATMP) for the suburb of Willaston is currently being prepared which should seek to address a number of permeability issues across Redbanks road and Horrocks Highway.

8.9 Connections to Growth areas

The Gawler Town Centre, Springwood, Evanston Gardens, Evanston South, Gawler East and Concordia have all been considered for integration into the future walking and cycling network. Council will be required to provide Developers with the future walking and cycling network map, and regularly liaise and direct them to ensure high quality connectivity.

8.10 Gawler Greenway

The Gawler Greenway will form an important north-south off-road spine for walking and cycling in Gawler. It is recommended that Council meet with DPTI to discuss Councils commitment to walking and cycling with a view to coordinate the shared path construction with the future electrification of the Gawler Line works.

8.11 Missing Links

Walking and cycling networks must be seamless to ensure the safety of their users. Currently there are a number of minor missing links in the footpaths and cycling infrastructure networks. For details see Section 11.

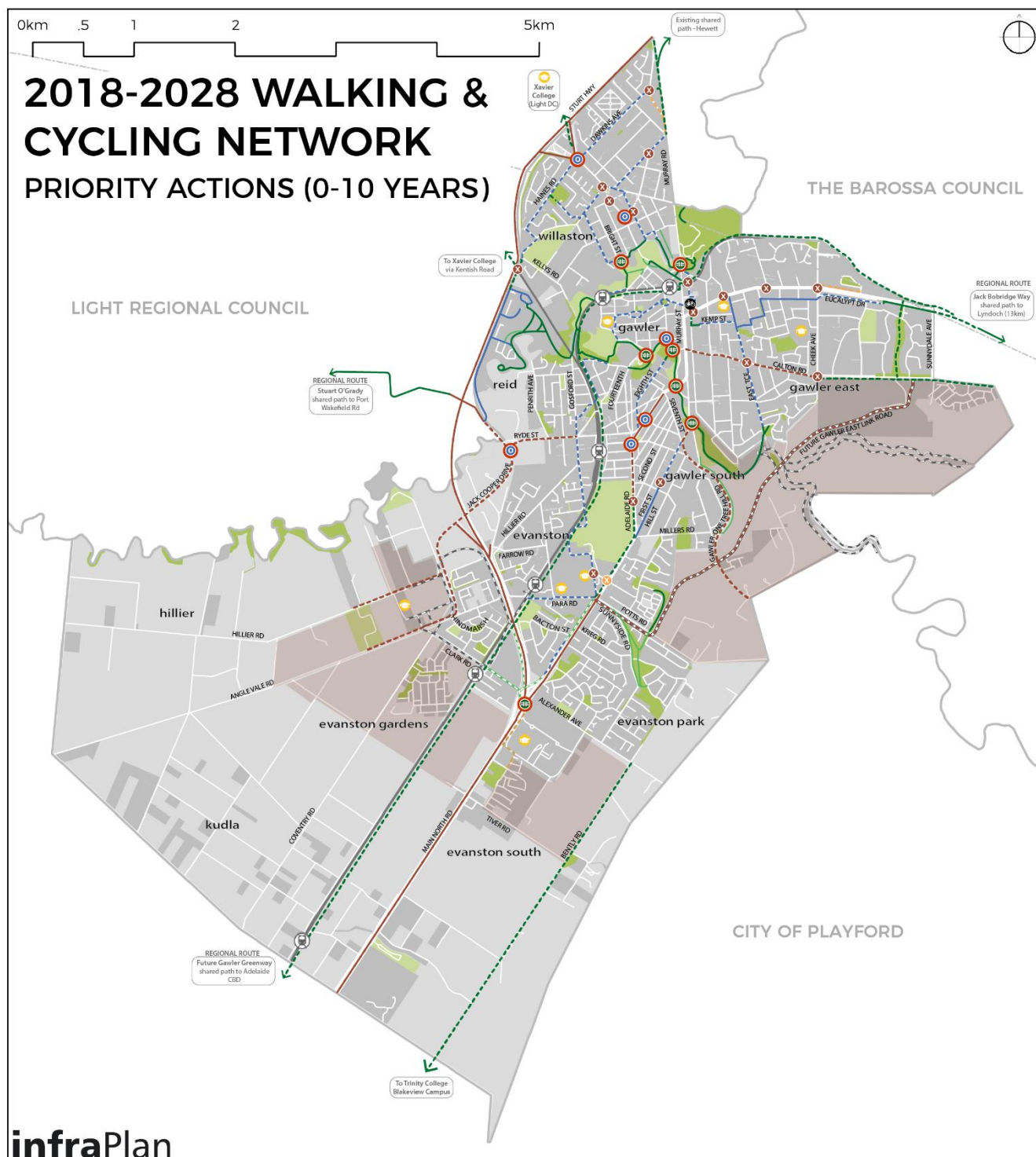
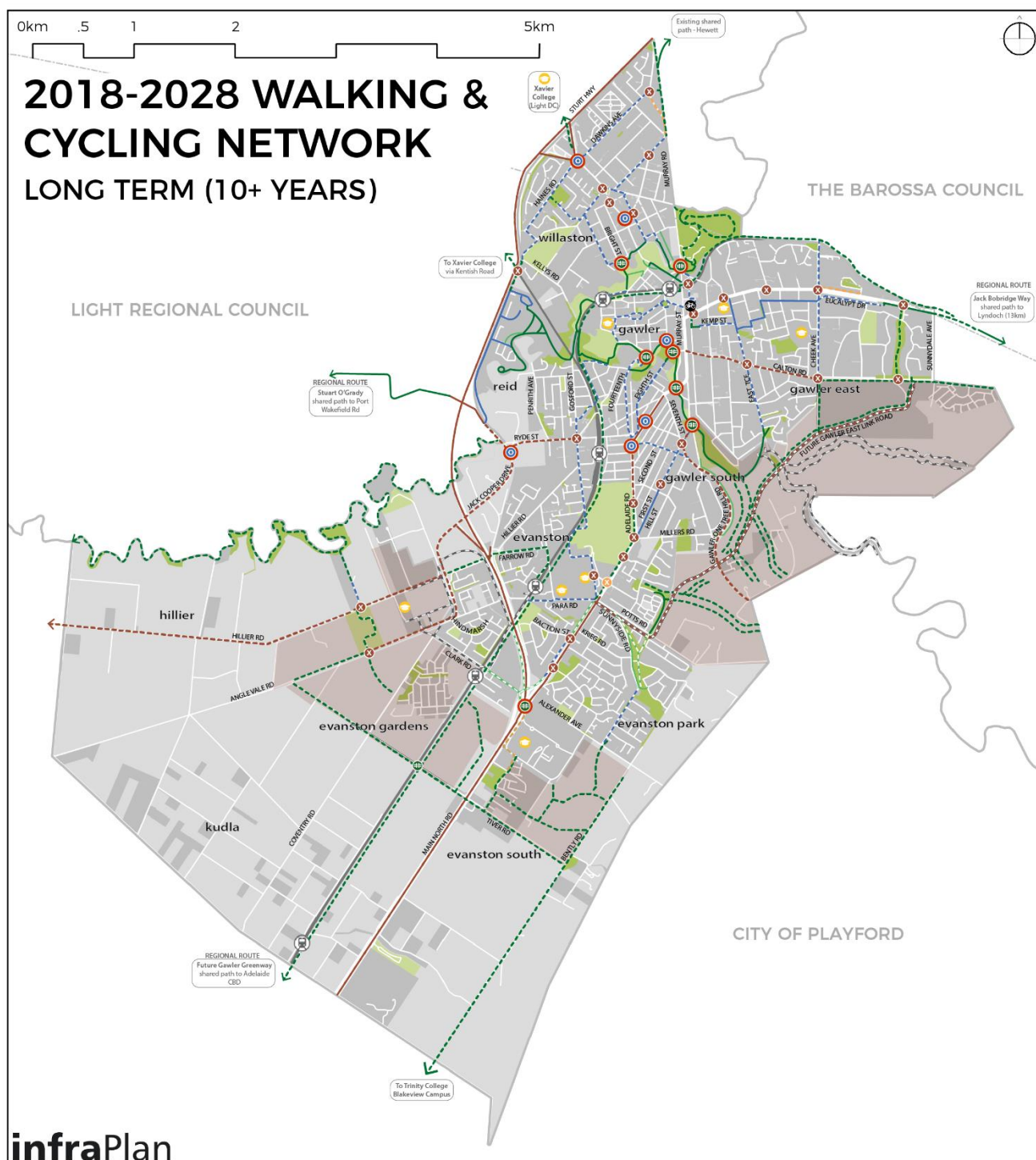


Figure 46: Priority 10 Year Actions. Refer to Action Plan for details.



infraPlan

LEGEND: EXISTING

- main road route
- local road route
- off-road route
- un-sealed path
- growth areas
- growth area links
(indicative only - to be approved by council and provided as part of development)
- ⊙ roundabout
- ⚡ bridge/grade separated
- ⦿ schools
- ⚙ bike hub

LEGEND: 2018 RECOMMENDATIONS

- recommended main road route
- recommended local road route
- recommended off-road route
- formalise existing unsealed path
- new footpath
- ⊙ safety improvements/upgrades required
- x new pedestrian crossing
- x new signalised crossing

*Please note: proposed off road paths along river corridors (particularly in Gawler East and Gawler South) are indicative only and require further assignment and design to determine viability

Figure 47: The Long-term Walking and Cycling Plan

9. SUPPORTING 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.

9.1 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.

Examples include:

- Support 'Ride to Work and Walk to Work Days', by providing a free breakfast at the Bike Hub;
- Use social media to promote cycling and spread the news of new and upgraded routes.
- Continue to support and promote the various walking and cycling community groups;
- Promote the Gawler bike hub as a key node for information – bike hire etc.
- Continue to collaborate with DPTI on the 'Way2Go' program, by identifying primary schools which can become involved in the program, and budgeting and resourcing to assist with the program implementation and any related engineering treatments.

9.2 Warnings, Reminders and Enforcement

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 do occur and it is the responsibility of all path users to be courteous and exercise a degree of caution. Council and/or SAPOL can assist with cyclist and pedestrian safety by warning, reminding and/or enforcing the law to motorists, cyclists or pedestrians as required. This may include an activity that flouts the law, the Australian Road Rules, and/or may potentially cause a safety hazard to themselves or others. Some examples are:

- motorists who park a vehicle illegally in a bicycle lane,
- motorists who do not allow 1 metre between their car and a cyclist when overtaking,
- cyclists who; do not wear a helmet, undertake an illegal movement, or run a red light,
- cyclists who ride too fast on a footpath and endanger pedestrians.

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

Reminder signs and pavement stickers for all road users are useful and examples from the City of Adelaide are illustrated in Figure 49.

9.3 Mobile phone distraction

Given the increasing popularity of smart phones and other hand-held devices, it is not surprising that pedestrian distraction by technological devices is becoming a more prominent issue.

Distractions from mobile devices can cause pedestrians to walk more slowly, change directions more frequently, and make them less likely to be aware of other street users. This exposes them to far greater risk of an accident. Results of various national and international studies indicate that smart phone distraction while walking and crossing the road was highest among 18-30-year old's, who were significantly more likely to report smart phone use while crossing the road compared to those in older age groups.

In Australia, as many as one in three pedestrians use a mobile phone while crossing the road (Pedestrian Council of Australia). There are currently no laws within any Australian State that specifically target pedestrians using their mobile phones. Such behaviour may be caught under other offences, such as jaywalking, however these are logistically difficult to police and therefore rarely enforced.

Traditional measures for pedestrian safety are focussed on speed control as well as maintaining separation between pedestrians and vehicles. These are, however, less effective if pedestrians are not attentive. Therefore, cities around the world have begun to implement public awareness campaigns and streetscape programs to counter the impacts of distracted walking and better alert distracted pedestrians of hazardous locations. These recent innovations generally focus on avoiding collisions between pedestrians and capturing the attention of pedestrians looking downwards at their phones (See Figure 48). The left image in Figure 48 (Texting path / No Texting path) is an example from Antwerp, Belgium. It is not recommended for the Town of Gawler but highlights the extremes that some cities are going to in this regard.



Figure 48: Distracted pedestrian treatment examples



Figure 49: Reminder Signs / Stickers, City of Adelaide

10. FUNDING OPPORTUNITIES

Expanding and improving the cycling network will require ongoing and greater levels of investment than has previously been allocated to cycling. Implementation relies on internal funding allocation, as well as external funding. The timing and delivery will be dependent on Council budgetary processes and the receipt of grant funding from state and federal sources. Many funding applications require a considerable level of planning and business case preparation, which this Plan will assist with.

Below are some funding opportunities Council can pursue, or encourage individuals, community groups and businesses to apply directly in conjunction with the information provided in this Study.

10.1 Co-Funding Options

Given a number of the recommendations set out in this Walking and Cycling Plan will involve collaboration with other authorities, it is important that Council begins a line of communication regarding the proposed works and potential co-funding scenarios.

It is recommended that the Town of Gawler begins liaising with the relevant bodies involved in these actions (such as DPTI, Light District Council, Barossa Council, City of Playford, Trinity and Xavier Colleges, and the developers of various growth areas). These relevant bodies are identified as part of the 10-Year Action Plan in Chapter 11.

10.2 Black Spot Program

The Black Spot Programme is part of the Federal and State Government's commitment to reduce crashes on Australian roads. Funds are directed towards significantly reducing crashes by the identification and treatment of locations and sections of road that have an unsatisfactory crash record or that have a significant crash potential. Funds from the State Black Spot Program are specifically available to councils as subsidy funding for cycling safety infrastructure projects. Applications can be submitted late in the year for the following financial year's program. Subsidy funding is two-thirds of the total project cost with council required to provide the remaining one-third. The maximum total project cost is limited to \$100,000 (maximum funding contribution of \$66,667)

As an example, notorious locations may be eligible for Black Spot funding for the:

- construction of on-road bicycle lanes;
- construction of off-road shared use paths; and
- construction or modification of median refuges or road crossings.

10.3 State Bicycle Fund

The State Bicycle Fund is an annual subsidy scheme that provides financial assistance up to a dollar-for-dollar basis to councils to progress cycling initiatives in their area. The Fund has fostered a long-standing partnership between the State Government and councils to respond to federal, state and local government strategies that encourage cycling.

Suitable projects for funding include:

- development or review of Local Area Bicycle Plans;
- construction of on-road bicycle lanes and or off-road cycling or shared use paths;
- installation of bicycle parking;
- construction or modification of median refuges or road crossings; and

- the promotion of cycling and cycling facilities.

Subsidy funding is up to 50% of the total project cost with council required to provide the remaining amount. The maximum total project cost is limited to \$100,000 (maximum funding contribution of up to \$50,000).

10.4 Office for Recreation and Sport

Various funding opportunities are available to local governments, organisations and individuals to provide high quality active recreation and sport facilities, programs, initiatives and activities.

Details of the grants can be found here: http://www.ors.sa.gov.au/funding/apply_for_funding

10.5 Open Spaces & Places for People Fund

The Open Spaces & Places for People Fund is a State Government grant program available to all South Australian councils to strategically acquire, plan, design and develop quality regional open space and public places of community significance.

Preference is given to projects located within the Metropolitan Open Space System (MOSS). MOSS includes the Gawler River, Gawler Buffer and Little Para River. Projects must be on land with free public access and assists councils and their communities to:

- add to their area's vitality;
- enhance public places in terms of use ability, safety and visual appeal;
- develop a 'sense of place' and identity that reflects local culture, heritage and character;
- improve the efficiency and economic performance of urban and rural centres and other strategic places; and
- improve the relationship between public and private areas.

The program also aims to foster the development of an urban design culture within Councils, ensuring a commitment to strategic collaborative practices and high quality, sustainable outcomes.

Funding for cycling and walking facilities can be provided under both open space and places for people components, depending on the project. Specifically, the grants accept within their objectives to provide safe walking and cycling links between communities and land uses, as well as improving the environment for pedestrians and cyclists where appropriate. For more information: https://www.sa.gov.au/_data/assets/pdf_file/0010/127738/Open-Space-and-Places-for-People-Funding-Guidelines.pdf

10.6 Bikes for Better Business

The Bikes for Better Business projects seek to facilitate an increase in bike riding to and from local businesses, contributing to a more bike-friendly city. The program is funded by DPTI and encourages local businesses to contribute toward establishing bicycle parking and end-trip facilities within close proximity. Other metropolitan councils have partnered with DPTI as part of this scheme, including the Adelaide City Council and the City of Holdfast Bay.

The Town of Gawler can partner with DPTI as part of the Bikes for Better Business program and encourage businesses, particularly those in tourist hotspots and retail centres to apply for grant funding.

10.7 Community Grants

Although not aimed towards Councils, DPTI and the Motor Accident Commission (MAC) offers community grants to groups and organisations to assist in delivering small scale projects that support safer, greener and more active travel choices. Projects can focus on improving road safety, getting people cycling, walking or catching public transport, replacing car journeys with technology, doing things locally, or using cars in a smarter manner.

The Town of Gawler can play a role in encouraging its resident groups, schools, businesses or other active organisations to consider applying for the Community Grants.

For more information: http://www.dpti.sa.gov.au/communityprograms/community_grants.

11. 10-YEAR ACTION PLAN

Action	Description	Cost (\$)	Notes	Priority
1	Connect the Jack Bobridge Bikeway into the Gawler Township & Bike Hub			
1.1	Sharrows: Eucalypt Drive (Cheek Avenue to existing shared path on Barossa Valley Way)	\$40,000	Sharrows, Signage & lighting	Short
1.2	Update sharrows between Cheek Avenue and East Terrace to reflect new route	\$40,000	Sharrows	Short
1.3	Sharrows: Kemp Street & David Street (East Terrace to existing shared use path at end of David Street)	\$45,000	Sharrows, Signage & lighting	Short
1.4	Shared Path: High Street - eastern verge (David Street Shared Path to Barossa Valley Way)	\$70,000	Linemarking & parking relocation only	Short
1.5	Pedestrian Refuge Crossing: Barossa Valley Way (east of High Street junction)	\$220,000	Includes removing left turn slip lane onto High Street	Short
1.6	Liaison and advocacy: with The Barossa Council and Concordia Developers to ensure their Shared Path connects into Eucalypt Drive Sharrows (action 1.1 above)	\$0	Council liaison only	Short
1.7	Liaison and advocacy: with The Barossa Council and Concordia Developers for potential Shared Path along Rail Easement from Jack Bobridge to Murray Street	\$0	Council liaison only: advocate for 3.5m wide shared path connecting to Concordia Shared Path and Jack Bobridge Bikeway	Long

Action	Description	Cost (\$)	Notes	Priority
2	Connect the Stuart O'Grady Bikeway into the Gawler Township and Bike Hub			
2.1	Sharrows: Hallam Drive (connecting to existing shared path network on either side of Gawler Bowling Club)	\$45,000	Sharrows, Signage & lighting	Short
2.2	Sharrows: Drury & Barber Streets (connecting existing shared path to Burrows Street Shared Path)	\$30,000	Sharrows, Signage & lighting	Short
2.3	Sharrows: Edith, Warren & Union Streets (From Clonlea Park Shared Path to Bike Hub)	\$50,000	Sharrows, Signage & lighting	Short
2.4	Rail Crossing: Shared Path Passive Rail crossing at Warren Street	\$150,000	Includes lighting, signage & Shared Use path ramps	Short
2.5	Council to liaise with DPTI regarding connections from Paternoster Road to Sturt O'Grady with consideration of permeability between Reid and Willaston.	\$0	Council liaison only	Short
Action	Description	Cost (\$)	Notes	Priority
3	Connect the Bike Hub to the River Shared Path network			
3.1	Sharrows: Cowan Street (Murray Street to Porter Street - around Orleana Square)	\$15,000	Sharrows only	Medium
3.2	Sharrows: Parnell Street	\$1,000	Includes Porter St turns	Medium
3.3	Sharrows: Nixon & Paterson Tce (Parnell Street to Gawler Central Netball Club access road - link to Shared Path)	\$2,500	Sharrows only	Medium
	also achieved in Actions 2.3 and 2.4			

Action	Description	Cost (\$)	Notes	Priority
4	Safer Access to and from Schools			
4.1	Shared Path: formalise existing unsealed paths between Clarke Road and Willason Ave	\$90,000	3.5m sealed shared path (excludes lighting)	Short
4.2	Liaise with DPTI to explore safety and amenity improvement options for Gawler Bypass/Main North Road	\$0	Liaison with DPTI for part-funding	Short to Medium
4.3	Sharrows: Willason Ave (full length)	\$5,000	Sharrows and signage only	Medium
4.4	Shared Path: west side of Main North Road (between Bacton St and Second St) including pedestrian refuge at Second Street/Adelaide Road	\$250,000	Includes refuge crossing at Second Street	Short to Medium
4.5	Sharrows: Para Rd & Barnet Road (from Ryde Street to Adelaide Road and Evanston Rail Station)	\$100,000	Sharrows and signage only	Short to Medium
4.6	Shared path: link to Xavier College via Kentish Rd from proposed Shared Path rail crossing between Patenoster and Two Wells Road	\$40,000	Liaise with DC Light. Route is through Gawler Bypass underpass to Atyeo Road (does not include rail crossing - action 8.4)	Short to Medium
4.7	Shared path: link to Xavier College via western verge of Redbanks Road (From Weylands Road to Xavier College)	\$60,000	3.5m shared path - Requires liaising with Light DC & DPTI	Short to Medium
4.8	Extend footpath to end on Greenslade Boulevard and continue to Trinity College property boundary and connect to underpass	\$60,000	1.5m partial exposed aggregate footpath	Short to Medium
4.90	Formalise the unsealed footpath on Main North Road continuing from the sealed section to Gawler Motel	\$50,000	1.5m footpath	Short to Medium
4.10	Shared Path: Bentley Road (From Tiver Road Gawler to Playford Council)	\$1,000,000	Liaise with City of Playford and Trinity College (includes 2x new footbridges)	Medium
4.11	Refuge crossing required: Barnet/Tulloch Road	\$20,000	Median refuge	Short
4.12	Comission study into walkability, connectivity and crossings around school precincts	\$15,000	Council in-house or engage consultant	Medium
Action	Description	Cost (\$)	Notes	Priority
5	Wayfinding and Mapping			
5.1	Wayfinding Strategy and Mapping	\$20,000	Preparation of Strategy	Short
5.2	Sign production and installation	\$20,000	Production and installation	Short

Action	Description	Cost (\$)	Notes	Priority
6	City-wide upgrade and widening of footpaths and foot bridges			
6.1	Continue to upgrade footpaths in a prioritised manner	\$500,000	Assumes \$50k/year for 10 years. Widen existing footpaths and install new footpaths (1.5m wide)	Ongoing
6.2	Council to review & update Footpath and Cycleways Policy	\$0	Council in-house	Short
6.3	Council to develop a Prioritisation tool for upgrading footpaths & pedestrian improvements	\$20,000	Council to comission study or develop in-house	Short
6.4	Upgrade narrow footbridge: South Para River at Whitelaw St	\$200,000		Short
6.5	Upgrade narrow footbridge: South Para River at Fourteenth St	\$200,000		Medium
6.6	Upgrade narrow footbridge: South Para River at Bright Street	\$200,000		Medium

Action	Description	Cost (\$)	Notes	Priority
7	Safe Road Crossings and improved Cyclist Squeeze Points (Liaise with DPTI for part-funding)			
7.1	Roundabout Design assessment: Adelaide Road/nineteenth/fifth street roundabout	\$10,000	Assessment and design only - Liaise with DPTI for part-funding	Medium
7.2	Roundabout Design assessment and kerb ramp: Adelaide Road/sixth street roundabout	\$10,000	Assessment and design only - Liaise with DPTI for part-funding	Medium
7.3	Roundabout Design assessment: Whitelaw/Tod/Reid street roundabout	\$10,000	Assessment and design only	Medium
7.4	Roundabout Design assessment: Jack Cooper Drive/Ryde street roundabout	\$10,000	Assessment and design only - Liaise with DPTI for part-funding	Medium
7.5	Roundabout Design assessment: Redbanks/Weyland/Dawkins/Haines street roundabout	\$10,000	Assessment and design only - Liaise with DPTI for part-funding	Short
7.6	Roundabout Design assessment: Horrocks Highway/Redbanks Road roundabout	\$10,000	Assessment and design only - Liaise with DPTI for part-funding	Medium
7.7	Design assessment: Bridge Street South river crossing - undertake Pedestrian/Cyclist bridge feasibility study	\$10,000	Assessment and design only	Long
7.8	Design assessment: shared path crossing of First/Murray Street	\$15,000	on west side of First Street on bend subject to vegetation assessment	Medium
7.9	Design assessment: Murray Road at North Para River Ford crossing	\$10,000	Assessment and design only	Medium
7.10	Refuge crossing required: Drury Street/Horrocks Highway	\$30,000	Median refuge	Medium
7.11	Refuge crossing required: Holmes Street/Redbanks rd/Princess Street	\$20,000	see willaston LATMP for crossing details	Short
7.12	Refuge crossing required: Ayling Street/Redbanks rd	\$20,000	Median refuge	Short
7.13	Refuge crossing required: Davies Street/Horrocks Highway	\$30,000	Median refuge	Medium
7.14	Refuge crossing required: East Terrace/Lyndoch Road	\$20,000	Median refuge	Short
7.15	Refuge crossing required: East Terrace/Calton Road	\$20,000	Median refuge	Short
7.16	Refuge crossing required: Cheek Ave/Lyndoch Road	\$20,000	Median refuge	Medium
7.17	Refuge crossing required: Cheek Ave/Calton Road	\$20,000	Median refuge	Medium
7.18	Refuge crossing required: Bella Street/Lyndoch Road	\$20,000	Median refuge	Medium
7.19	Refuge crossing required: First Street/Third Street	\$20,000	Median refuge	Medium

Action	Description	Cost (\$)	Notes	Priority
8	Reid, Willaston and Hewett Connections			
8.1	Shared Path & Refuge Crossing: Murray Rd & Horrocks Highway along eastern verge, (Kestral to Kingfisher and along Horrocks Hwy to Murray Road) Refuge crossing on Main North Road/Dawkins Ave	\$150,000	3.5m shared path. Includes refuge crossing on Horrocks Hwy.	Medium
8.2	Sharrows: Dawkins Ave and Haines Road	\$25,000	Sharrows and signage	Medium
8.3	Shared Path: through vacant land between Murray Road and Main North Road at Dawkins Ave	\$0	Investigate feasibility	Medium
8.4	Shared path: Two-Wells Rd to Paternoster Road over Roseworthy Rail line.	\$30,000	Remove mound of soil at rail line. (does not include railway maze crossing)	Medium
8.5	Sharrows: from Haines Road along McGonigal Drive and Holmes Street to Redbanks Road/Ayling & Dwyer Limeklin Park (including shared path link through Haines Road reserve)	\$25,000		Medium
8.6	Sharrows: Panter Street & Weaver Drive (from Holmes Street to Bright Street River Crossing)	\$5,000		Medium
8.7	Sharrows: Davies St & Drury St (from Murray Rd to Barber St)	\$15,000	Sharrows and Signage	Medium

Action	Description	Cost (\$)	Notes	Priority
9	Connections to growth areas			
9.1	Sealed Shoulders: Gawler-One Tree Hill Road, Eckerman Road to Gawler Terrace	\$250,000	1.8m wide sealed shoulders with bike logos	Medium
9.2	Shared Path: Southern verge of Calton Road (east of Cheek Avenue)	\$0	By Developers of Springwood - Council to liaise	Medium
9.3	Enhanced Bike Lanes: Calton Rd (Cheek Avenue to Murray Street)	\$50,000	Includes refuge crossing at East Terrace	Medium
9.4	Shared Path: Via Easement by Rebbeck Court (Calton Road to Barossa Valley Way)	\$75,000	3.5m wide - requires crossing at Phillips Avenue	Medium
9.5	Sealed Shoulders: Jack Cooper Drive (Angle Vale Road to Ryde St)	\$280,000	Liaise with DPTI for part-funding	Medium
9.6	Sealed Shoulders: Angle Vale Rd (Jack Cooper Drive to Karbeethan Reserve)	\$130,000	Liaise with DPTI for part-funding	Medium
9.7	Sealed Shoulders: Hillier Road (Jack Cooper Dve to Karbeethan Reserve)	\$130,000	1.8m wide	Medium
9.8	Sharrows: East Tce (Dead Mans Pass Reserve to Lyndoch Road - connect to existing sharrows near Lyndoch Road)	\$50,000	Sharrows only	Medium
9.9	Liaise with Developers of all land releases to ensure high quality walking and cycling network connectivity integrates Gawler Walking and Cycling Networks	\$0	Council in-house	Ongoing
	Also refer action 1.7 - Concordia development links			

Action	Description	Cost (\$)	Notes	Priority
10	Gawler Greenway Commitment & Advocacy			
10.1	Regularly liaise with DPTI re: construction of Gawler Greenway, as part of Rail electrification works. Note that parts of the Greenway will be constructed by Council as part of other shorter connections.	\$0	Ongoing - Council in-house. Dalkeith Rd -Gawler East Railway stn Assumes funded by State Government and remains in railway corridor	Ongoing

Action	Description	Cost (\$)	Notes	Priority
11	Missing Links			
11.1	Footpath: West side of Main North Road (Dawkins Ave to Chamberlain Rd)	\$30,000	1.5m wide	Short
11.2	Footpath : Lyndoch Road (Powell Crescent to Cheek Avenue)	\$30,000	1.5m wide	Short
11.3	Widen Path to 3.5m: Eighth St to Goose Island	\$20,000	excludes section over bridge	Short
11.4	Bicycle Lanes: Adelaide Rd (Second Street to Fifth Street)	\$10,000	Bicycle / Car Parking Lanes boths sides	Short

Appendix A – Strategic Alignment Literature Review

- The **30 Year Plan for Greater Adelaide** sets out policies and targets aimed at managing the growth and development of Greater Adelaide. Policies which strive to ensure that both infill and greenfield developments are connected to, and make use of existing infrastructure makes the Town of Gawler strategically significant due to its rail connection. Various infill and growth areas have been earmarked around the Town and are expected to expand to include surrounding greenfield fringe developments which will all make use of existing infrastructure in the Town of Gawler.
- The **Integrated Transport and Land Use Plan** seeks to facilitate a better-connected South Australia. Various actions set out in the plan are significant to the town of Gawler. These include road improvements and developments in growth areas such as the Gawler East local link road. Active transport incentives include electrification and possible extension for the Gawler Railway as well as improving walking and cycling facilities in key locations and completing the Gawler to City Greenway.
- The **Town of Gawler Community Plan 2014-2024** identifies Councils priorities over the next 10 years and is used to guide the allocation of resources in terms of the infrastructure and services provided to the community. The Plan is reinforced by 5 key goals: 'A Uniquely Identifiable Township', 'Sustainable Growth Management', 'A Healthy, Active, Safe, Engaged Community', 'To Respect and Nurture the Environment' and 'A Strong Vibrant Community'. Increased walking and cycling pathways are advocated throughout the plan as a means of sustainable growth.
- This Plan has also been developed in response to the **Town of Gawler Transport and Traffic Management Plan**, which identifies and prioritises a number of transport initiatives while considering future growth and development in the Town of Gawler. The study has modelled traffic projections for the arterial road network from various growth scenarios up to the year 2038. Projections show significant traffic growth on Lyndoch Road (13000-18000vpd increase), Calton Road (10,000-13,000vpd increase) as well as the proposed East Link Road (18000vpd) and moderate increases on Murray Street Bridge Street and Twelfth Street. This significant increase in vehicular traffic would suggest an increased safety risk to vulnerable road users particularly those using Calton and Lyndoch Roads. It is further outlined in the plan that pedestrians and cyclists should be top priority when planning for transport.
- The newly developed **Gawler Town Centre Urban Design Framework** has also been considered in the context of this plan. The UDF was developed in response to the announcement that the Town of Gawler will receive federal funding to revitalise its CBD. The document outlines the communities desire for a more vibrant town centre that appropriately incorporates mixed-use developments within the areas of historical character. Increasing residential development within the town centre and creating walkable neighbourhoods are key objectives of the framework. Amendments to the existing planning policy are required to enable this vision.
- The Town of Gawler have also developed age specific strategies such as **Child and Youth Friendly Greater Gawler** and **Town of Gawler Ageing Strategy Plan 2009-2014** which have been considered in the context of this report. Access to independent mobility opportunities is outlined in both strategies as an important factor in achieving various goals for these population groups.

Appendix B: Master Plan Review

Evanston Gardens Development Plan Amendment Traffic Assessment

The traffic assessment in this document projects an additional 6,800 vehicles per day from the ultimate development, most of which are projected to be work trips to Adelaide and the northern suburbs via Angle Vale Road and the Northern Expressway, and via Jack Cooper Drive, Gawler Bypass /Main North Road. Additional Gawler Town Centre and Gawler Green shopping trips and Gawler Super School and Trinity College trips would also be envisaged, hence additional vehicular, bicycle and pedestrian trips would be anticipated on Jack Cooper Drive/ Ryde Street and Clarke Road/Dawson Road/Para Road and potentially the existing unsealed link to Trinity College.

The development proposes several new roundabouts on Angle Vale Road and at the junction of Jack Cooper Drive/Hillier Road. Additional internal subdivisions and cyclist infrastructure will be provided along Angle Vale Road/Hillier Road/Jack Cooper Drive/Gawler Bypass western verge/Clarke Road and Dawson Road.

Springwood Master Plan

The Springwood Master Plan is focused on achieving a place based and liveable development for its future residents. The development proposes a significant number of community facilities including a school, sporting ovals, a civic centre, and local shopping. The document outlines a considerable internal shared path and recreation trail network with potential linkages to the existing shared path network at Dead Man's Pass, the Jack Bobridge trail and the provision of a shared path on Calton Road. It is important that the internal walking and cycling network seamlessly links into the existing network and various destinations in the council area.

Gawler East Link Road

The proposed Gawler East Link Road will provide a new divided road with one lane in each direction, a wide central median and 1.5m wide bicycle lanes in each direction. Cheek Avenue is the preferred option for providing the primary connection to a potential North-Eastern Connector road to service the Concordia development. A connection through to Tiver Road is preferred at the southern end due to physical limitations along Potts Road and to reduce the impact upon existing residents.

The development will include an associated intersection upgrade at the Main North Road/Potts Road junction and a new roundabout at the junction with One Tree Hill Road. Ultimately the road will cater for traffic from the future Concordia Development as well as the adjacent Springwood development with potential AADT volumes of up to 18000vpd.

Appendix C: Walking and Cycling – Existing Issues

ISSUES: PEDESTRIANS

THE BAROSSA COUNCIL

LIGHT REGIONAL COUNCIL

0km 0.5 1 2 5km

Legend: DPTI ROAD (black dot), COUNCIL ROAD (red dot)

areas of high commercial land use density

TOWN CENTRE

Photo 1: Footpath not continuous corner of Powell Drive

Photo 2: No footpath on Gawler Plier bridge, Two Wells Road. Pedestrians must walk behind safety barrier to access

Photo 3: Narrow footbridge over South Para River, just north of Walker Place

Photo 4: Footpath blocked by stoby pole - King Street

Photo 5: Footpath clutter on shoreline - Murray Street

Photo 6: Narrow footpath and no kerb ramps - Eighth Street

Photo 7: Wide Driveway to cross (no tactile ground surface indicators) - Cowan Street opposite Light Square

Photo 8: Non-compliant kerb ramp, narrow footpath - Reid/ Finniss streets

Photo 9: Non-compliant kerb ramp, narrow footpath - Bridge Street near Gawler Station

Photo 10: Most shop entries have been updated to DDA compliant but occasional steps remain

Photo 11: Crossing in poor condition - no kerb ramps or tactile ground surface indicators - Murray Street

Photo 12: Footpaths are poor quality and narrow north of Lyndoch Road - Muar Road

Photo 13: Regular maintenance required

Photo 14: Bridge street north footpath too narrow on route to train station

Photo 15: Narrow and uneven footpath on Murray Road crossing North Para River is a squeeze point for cyclists and pedestrians

Photo 16: Landscaping overgrown on narrow footpath

Photo 17: ramp to Pioneer Park rotunda is DDA compliant but ends in grass with no links - hard for people in wheelchair

Photo 18: Pioneer Park paths do not link up - no ramps on opposite kerbside

ISSUES: CYCLISTS



Photo 1: High volume traffic on Adelaide Road at the Tulloch Road/Morrow Avenue intersection makes it difficult for pedestrians/cyclists to cross.



Photo 2: Existing pedestrian ramp beside Gawler Bypass linking Clark Road and Trinity College is too steep.



Photo 3: New footpath outside Aldi on western side of Tulloch Road is disconnected from Main North Road south.



Photo 4: Potentially hazardous squeeze point for cyclists at Barnet Street adjacent to Gawler College.



Photo 5: Potentially hazardous squeeze point for cyclists on Adelaide Road at Nineteenth Street intersection.



Photo 6: Potentially hazardous squeeze point for cyclists on Adelaide Road at Sixth Street intersection.



Photo 7: Potentially hazardous squeeze point for cyclists at northern side of Gawler River bridge on Two Wells Road.



Photo 8: Path leading from Eighth Street to Whitelaw Terrace footbridge too narrow for bi-directional walking and cycling.



Photo 9: Approach angle and width of footbridge south of Whitelaw Terrace too steep/narrow for the high levels of cycling, pedestrian activity from shopping centre.



Photo 10: Same footbridge as per previous shared path and footbridge shown.



Photo 11: Footbridge at south end of Bright Street towards Apex Park is too narrow for high frequency cyclist and pedestrian traffic.



Photo 12: Lack of bike lane continuity for east bound riders on Two Wells Road from the Stuart O'Grady Bikeway terminal.



Photo 13: Unprotected wide crossing of Twelfth Street at Adelaide Road.



Photo 14: Squeeze point for cyclists on Adelaide Road at Tenth Street left turn lane. Bike lane ends here but signage does not clarify that.



Photo 15: Narrow footbridge over South Para River just north of Walker Place looking south west from River shared path towards Eighth Street.



Photo 16: Narrow footbridge over South Para River looking west from Gawler River Club carpark on Fourteenth Street.



Photo 17: Narrow footbridge over South Para River looking east from Senior Citizens Club carpark on Fourteenth Street.

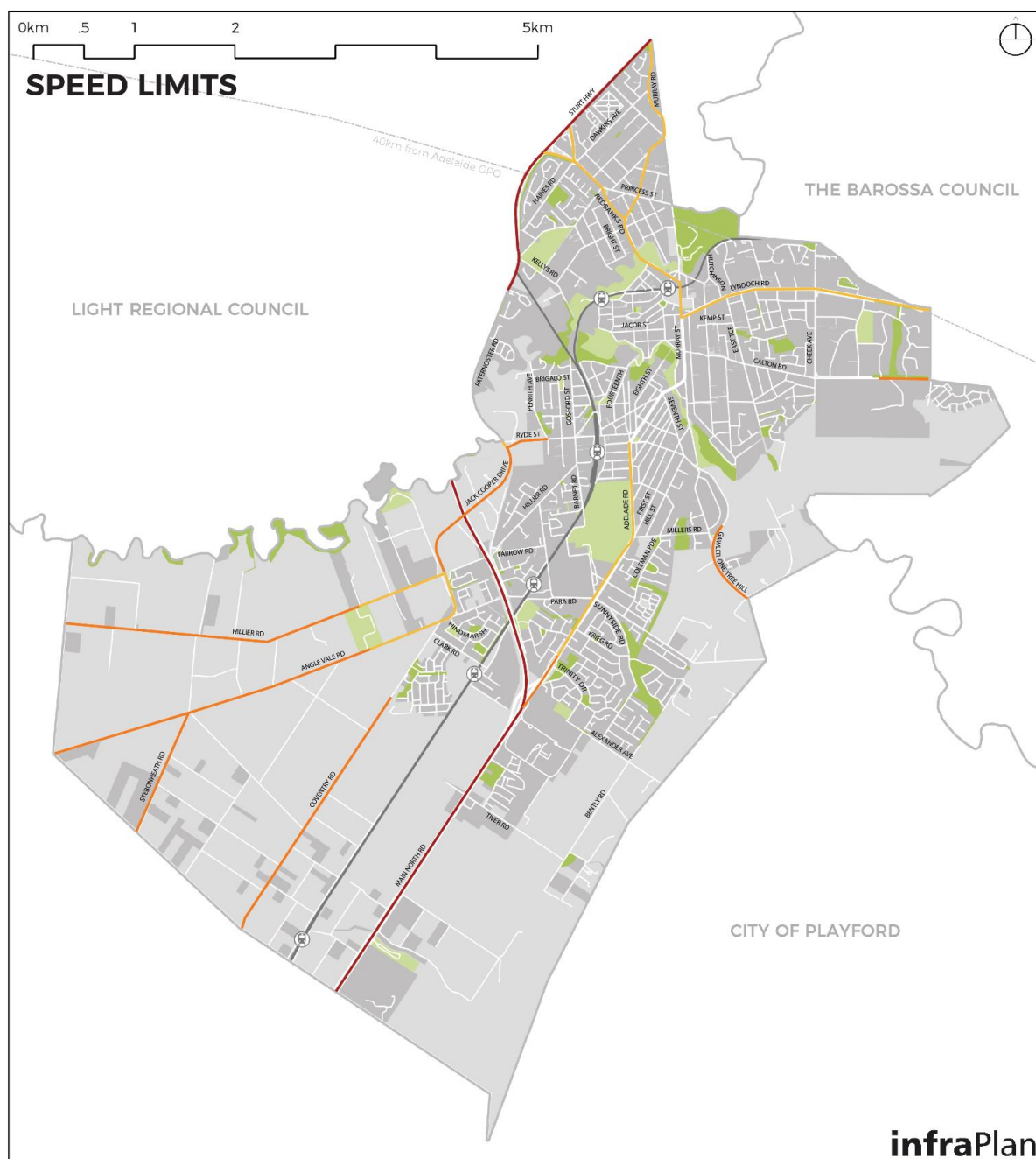


Photo 18: View of start of south bound bike lane on Bridge Street south Adelaide Road showing squeeze point on bridge.




Appendix D: Traffic Speed and Volume Data









 train station

 railway

Land Use

-  built environment
-  grassland + pasture
-  recreation
-  reserve

Speed limits (km/h)

-  60
-  80
-  100

*all unmarked roads are default 50 km/h limit (excluding school zones)

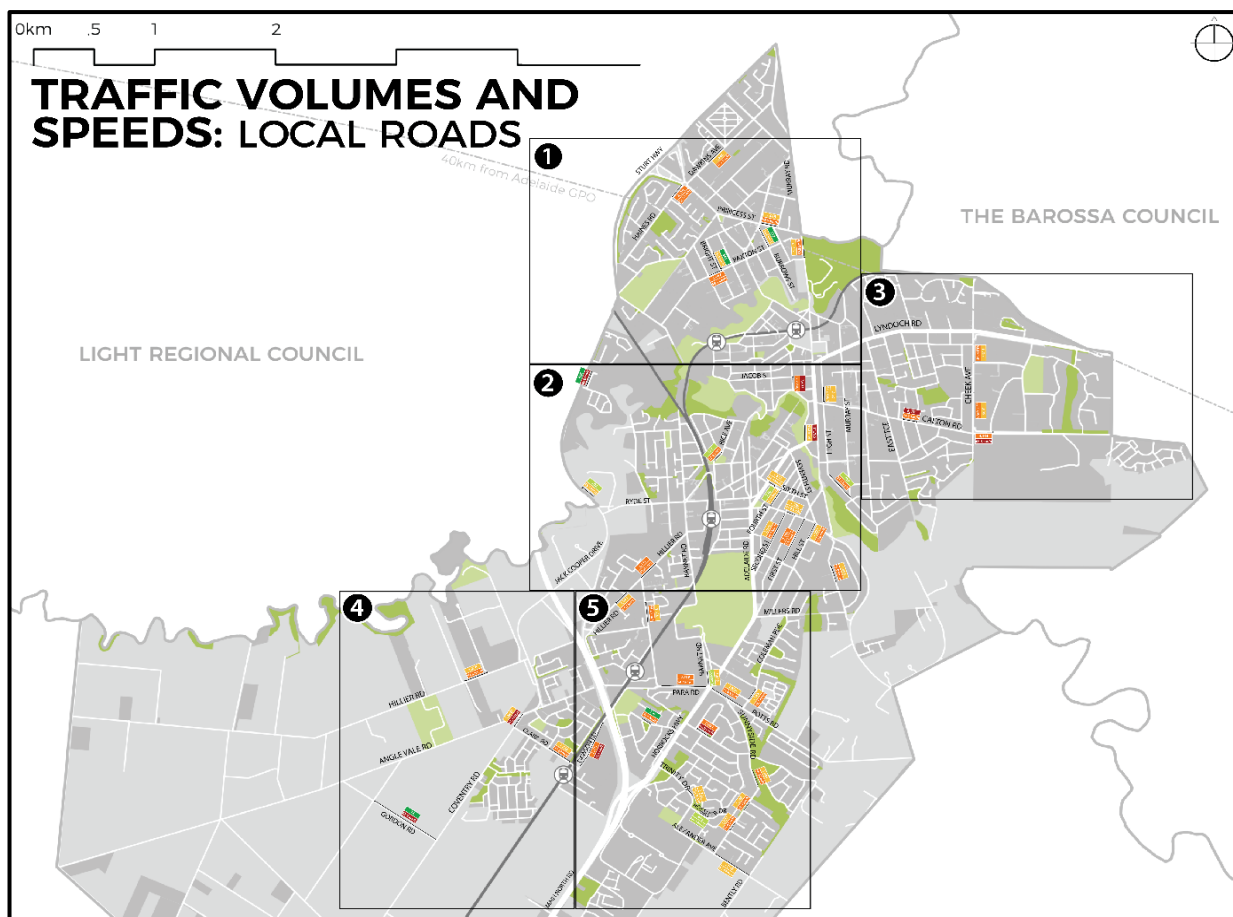


Figure 50: Local road traffic volumes and speeds - blow up 1





Appendix E: Design Toolkit

Contents

Overview, Cycling Infrastructure – On-Road or Off-Road

A: General

- A1: Neighbourhood Streets
- A2: Local Speed Precincts
- A3: Shared Zones
- A4: Shared Space
- A4: Signage and Wayfinding

B: End and Mid-Trip Facilities

- B1: Bicycle Parking
- B2: Repair Adjustment Stations
- B3: Seating
- B4: Other facilities

P: Paths

- P1: Pedestrian Only Paths
- P2: Cyclist Only Paths
- P2: Shared Paths
- P3: Separated Paths

R: On-Road Facilities

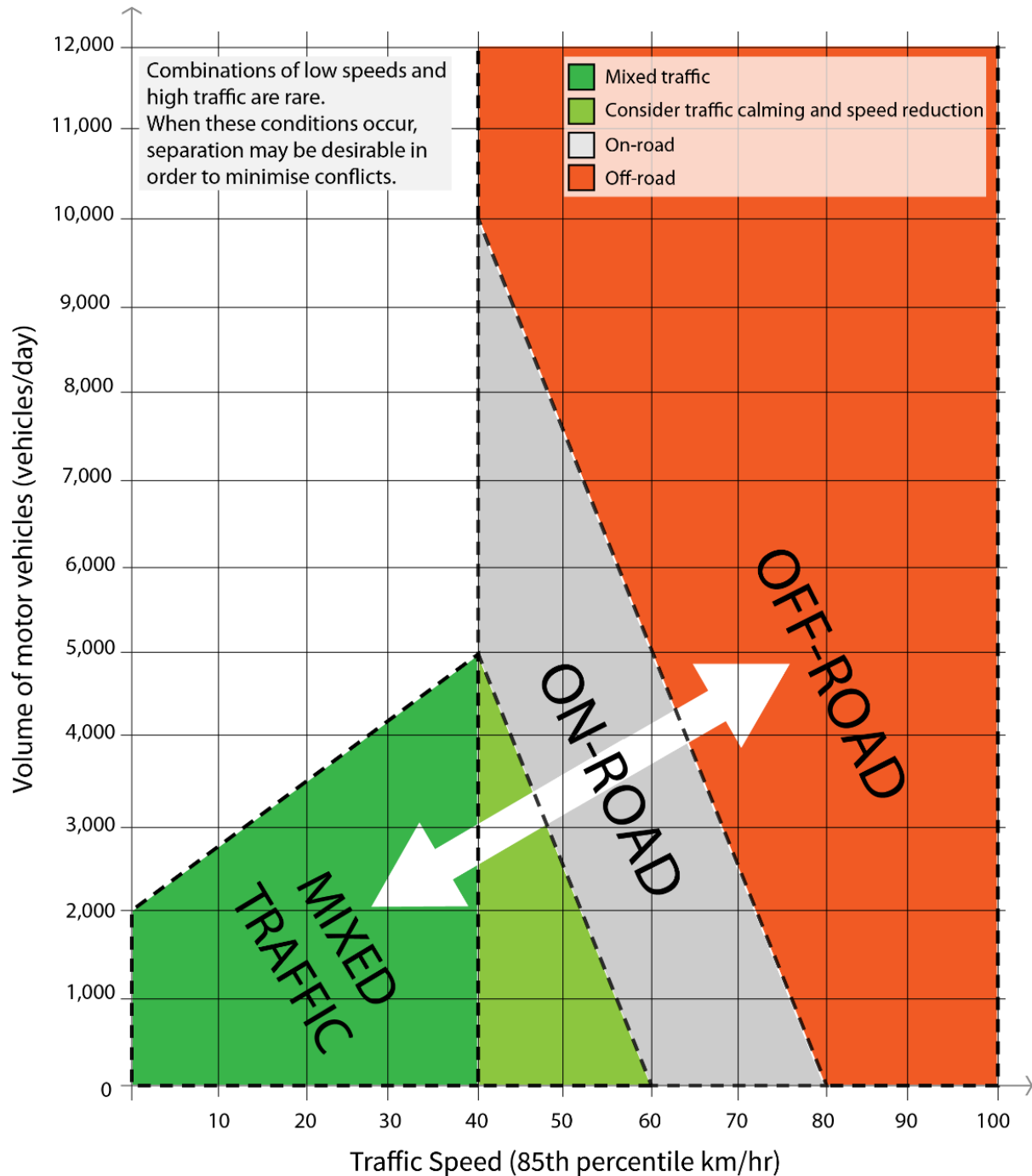
- R1: Enhanced Bicycle Lane
- R2: Separated Bicycle Lane
- R3: Exclusive Bicycle Lane
- R4: Bicycle / Car Park Lanes
- R5: Contra-Flow Bicycle Lane
- R6: Sealed Shoulders
- R6: Sharrow Line Marking

C: Road Crossings

- C1: Kerb Ramps
- C2: Median Refuge
- C3: Wombat Crossings
- C4: Head Start Lantern
- C5: Head Start Storage Area
- C6: Hook Turns
- C7: Roundabouts

Overview: Cycling Infrastructure - On-Road or Off Road

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 environment¹. 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.

¹See '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 with cyclist bypass



Photo 9: A slow speed environment through urban design

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 8: 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 9: Charlick Court, Adelaide.

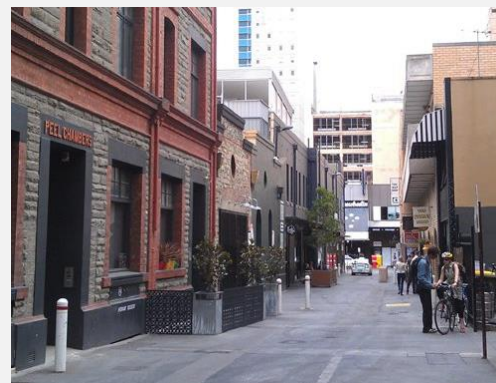


Photo 10: Peel Street, Adelaide.

- 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 11: Shared space, Haslach, Germany.



Photo 12: 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 13: Simple directional signage.

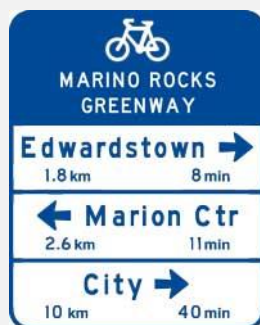


Photo 14: Directional signage with distances and estimated travel times, Marion, SA.



Photo 15: Route Markers and reassurance signs.

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 16: Bicycle parking rails
(short-term parking)



Photo 17: Bicycle cage, Leeds
UK (secure parking)



Photo 18: 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 19: Typical bicycle repair/adjustment station design.



Photo 20: 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 21: 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 Only 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 1: Recommended path width (source: Cycling Aspects of Austroads).



Photo 22: Coastal Cycling path, Perth.



Photo 23: 2-way cyclist path, Sydney.

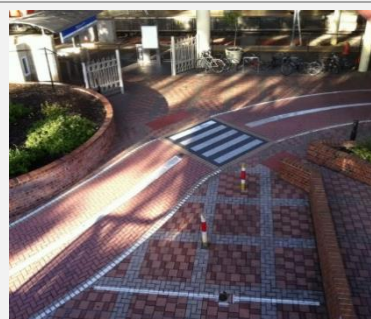


Photo 24: Cyclist path and footpath crossing, Perth.

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



Photo 25: Typical shared Path.



Photo 26: Shared Path as well as on-road lanes for faster cyclists, Hindmarsh SA.



Photo 27: 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 3: Recommended path widths (Source: Cycling Aspects of Austroads).



Photo 28: one-way separated path, Hamburg Germany (cycle path red paved / footpath (2-way) grey paved – separated by cobblestones).



Photo 29: 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 51: Chevron separated lane.



Figure 52: 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 30: Bike lane separated by parked cars, Albert Street Melbourne.



Photo 31: 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.

Road posted speed limit (km/h)	Lane width (m)		
	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 4: Exclusive lane width (source: Cycling aspects of Austroads).



Photo 32: 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 5: 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 6: Recommended dimensions for angle parking (source: Austroads aspects of cycling)



Photo 33: Bicycle car parking lane - parallel parking, Osmond Tce, Norwood.



Photo 34: 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 35: Contra-flow lane, City of Yarra Vic.



Photo 36: 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 7 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.

Element	Traffic volume (Annual Average Daily Traffic: AADT)				
	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 7: 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 37: Main North Road, sealed shoulders.

Design Toolkit No. R7: Sharrow Lane Marking

Shared Lane Marking (Sharrows), refer **Error! Reference source not found.** are recommended on key local road 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 is recommended so that the installation will comply with the DPTI requirements.

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Photo 38: Sharrow Linemarking (from DPTI website).

Road Crossings (C)

Design Toolkit No. C1: 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 39: Universal kerb ramp.



Figure 53: cyclist ramp up to footpath to avoid squeeze point

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 40: Cyclist only refuge, Portrush Road, Norwood.



Photo 41: 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 42: 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 43: 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 44: 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 45: Hook turn storage boxes at South Tce/Pulteney St, Adelaide.

Design Toolkit No. C7: Roundabout design for cyclists

In the past, Australian roundabouts have been designed as ‘tangential’ (refer Photo 46), which direct cyclists to the edge of the lane while motor vehicles remain in the centre at higher speed. Recent research has found that ‘radial’ design (refer Photo 47) is preferred as it reduces traffic speed and directs cyclists to the centre of the lane where they ‘claim their space’ in front of motorists, becoming more visible.

Existing 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.

At large roundabouts, particularly multi-lane roundabouts, cyclist separation should be provided, refer Figure 55.



Photo 46: Tangential roundabout



Photo 47: Radial roundabout (preferred design)

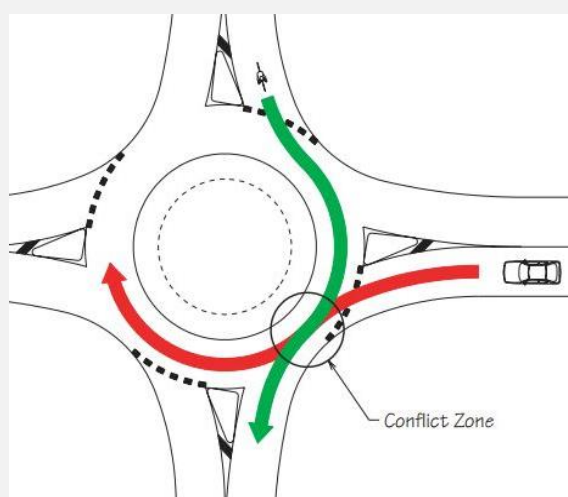


Figure 54: Cyclist and vehicle conflict zone at a roundabout (source: Bicycle Victoria).

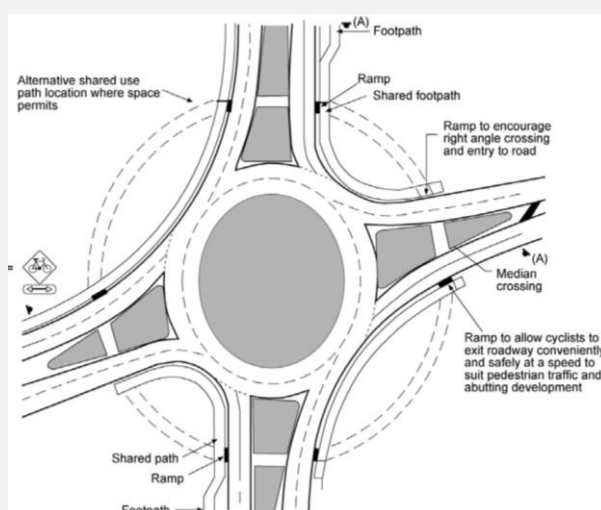


Figure 55: Cyclist separation at large, busy roundabout (source: Austroads)