City of South Perth

South Perth Bike Plan

2012 / 2017

Final Report

Prepared by Lamwise May 2012

Contents

Executive Summary

The South Perth Bike Plan 2012-17 proposes a comprehensive bicycle network for the City of South Perth (the City).

The City is in a fortunate position of hosting a well established bicycle network, but one that is not fit to function in the challenges that lie ahead. It is for this reason that a study has been undertaken to prioritise investment into the network for the next five years to ensure benefits are realised and most efficient.

Refer to page 15 for a map of the current bicycle network.

Conducive conditions are prevalent to operate a bicycle network that generates a percentage mode share for cycling that is competitive to the best localities around the nation. The culture of the car has been predicted to decline and transport agencies are focusing on bicycle and public transport above the car as a long term solution to move people through a transport network (refer to page 7 and Appendix 1).

This plan outlines a number of recommendations to the bicycle network, and to policy decisions and promotional aspects to generate an increased bicycle culture.

Network Recommendations

- Focus on routes to Canning Bridge Station and Curtin University, in particular the implementation of a high standard bike route between them.
- Focus on routes to Perth CBD, in particular improvements to north-south movements towards the Narrows Bridge (east of the Freeway in South Perth Peninsula).
- Focus on the network in Sir James Mitchell Park, to create route priorities for cyclists and pedestrians of different speed, level of confidence and vulnerability.
- Focus on providing bike parking at popular café destinations for cyclists, and consider converting car bays to bike parking on Mends Street and Angelo Street.

Other Recommendations

- Ensure projects funded through the Black Spot Program and Roads to Recovery Program consider the movement of cyclists through the project site, and provide treatment to support their requirements.
- Partner with the RAC on road safety issues such as awareness campaigns for drivers towards cyclists on roads in South Perth.
- Partner with the DoT on awareness campaigns on interaction between cyclists and pedestrians on shared paths (focus on SJMP and Freeway PSP).
- Resurface the bicycle lanes on roads that have them in red asphalt. This should be done during the time of scheduled resurfacing and note in the resurfacing program.
- Consider green asphalt treatments at conflict point locations. Discuss treatments with Main Roads and consider trial with the intention to become policy in future.

- Continue to seek funding for project implementation through the Perth Bicycle Network Grants Program.
- Consider Commonwealth Funding opportunities for project implementation.
- Modify the bicycle parking provision section in the City of South Perth Town Planning Scheme to include best practice provision for cyclists (refer to page 33).
- Update the Integrated Transport Plan
- Improve collection of count data bicycle (and pedestrian) use on key routes

The plan connects the bicycle network objectives in context to local, State and national transport related objectives, and the relevant local objectives of the City of South Perth Council.

It is intended that the plan be used to aid local government practitioners, developers, and active members of the community towards a bicycle oriented transport network.

1.0 Introduction

Creating a functional bicycle network has a higher purpose than encouraging more people to cycle. It is part of the solution to the transport challenges that authorities and communities presently face.

The City of South Perth is required to plan for additional dwellings to meet the targets of the State Government's *Directions 2031* planning strategy. This expected increase in population needs a corresponding increase in the capacity of the transport network.

The author believes an increase capacity can only be feasible if there is a change in the mode of transport from private motor vehicle to other modes such as public transport, cycling and walking.

In metropolitan Perth, and indeed around the nation, there is a fundamental shift in the concept of moving people: *to incorporate the bicycle as an authentic mode of transport*. That transport mode requires a corresponding network to be planned, implemented and maintained.

There is a real potential for incorporating the shift in the City of South Perth due to:

- The location (proximity to the city and natural environment)
- The network is already established to a basic degree.

An effective shift in transport mode requires a network that adequately caters for the bicycle. Appropriate funding needs to be allocated to construct cycle infrastructure in order to achieve the desired network.

The City of South Perth engaged *Lamwise* to coordinate the bicycle plan to develop a prioritised set of actions to achieve a functional network in the short term (0-5 years), and also to consider longer term objectives for the bicycle transport network.

Developing the plan required the consideration of a number of elements:

1. Understand the existing bicycle network (route audit)
2. Placing the network plan in a correct context (framework analysis)
3. Determine the factors that influence the network development (planning considerations)
4. Proposed a network for 2017 (vision)
5. Outline the steps to implement the network (project delivery)

The Bike Plan 2012-17 outlines the vision and determines the steps to achieve it over the next five years. Both the vision and the steps need to be practical and achievable for the objective to be successful.

In order to keep the plan to an appropriate length, the audit and recommendations for infrastructure are provided in a supplementary report.

2.0 Background

For the purpose of the study, the transport network is defined as the routes that are necessary to move *people* and *goods* to their intended destination. People travel for a variety of reasons but it can generally be tailored to either *purpose* or *leisure*. In other words, the travel can be a *means* or an *end*.

The focus of the plan is the movement of people traveling for a purpose, but consideration is also given to people that travel for leisure.

Given that people need to move from A to B in order to engage in their numerous daily activities, there is a potential for people to ride to their destinations and obtain the desired leisure at the same time.

The bicycle network is a component of the transport network, comprising of:

- specific portions of the road network
- the path network (excluding pedestrian only paths)

A bicycle network should effectively facilitate the movement of people on bicycles and should be considered as a useful and necessary component of the overall transport network.

Other modes of transport to facilitate the movement of people (for purposeful travel), in order of importance to this study, are:

1. Walking
2. Public Transport - Bus, Rail and Ferry
3. Private Motor Vehicle

Each of the modes requires a network to function effectively. These have been established to different extents depending on the mode. The purpose of this report is to implement a network of bicycle routes that can potentially attract people from travel by private motor vehicle and to a lesser extent, public transport.

Walking

Walking is unique in that it doesn't require a mechanical device, unless the person is mobility impaired, and is therefore less intrusive on the network. Walking is less dependent on a defined network (i.e. people can cut across grass and make shortcuts). Children (12 and under) can cycle on the pedestrian path network.

Often people walking and cycling can share the same network, but this is subject to a capacity limit. For instance, large volumes of people walking can create safety concerns when sharing the network with people cycling, and vice versa, so in some cases a separate network is necessary. The City of South Perth has encountered a capacity limit on its path system through Sir James Mitchell Park and has invested heavily in separating walkers from faster moving cyclists.

Public Transport

Public transport is often stretched for capacity and requires significant resources to expand service operations, therefore transferring trips to bicycle from public transport should also be an outcome worth pursuing for the City of South Perth.

Particular integration is paramount between the bicycle network and the public transport network, for together these provide a legitimate alternative for people to reach their destination outside the motorcar.

Motor Vehicle

Road congestion is to be targeted by authorities. The transport network capacity has to keep up with the increase in passenger and freight trips, and authorities tend to agree that one cannot build out of congestion.

Building a comprehensive bicycle network and promoting that mode is therefore one measure to manage congestion. The focus of these routes is to be on the corridors connecting activity centres and those that are most used by the motor vehicle.

The bicycle network needs to be *safe*, *convenient* and *connected* to be the important component of the transport network, and be attractive for commuters to influence their decision to ride instead of drive.

Land Use Planning

Authorities can plan for travel that is purposeful, especially the travel between a place of residence and the workplace (referred to as commuting). Greater cohesion is required to coordinate land use planning and transport network planning to reduce the amount of commuter travel.

As communities and cities expand, land use and transport network investment is needed to be managed appropriately. Authorities cannot stipulate precisely the locations of residence and work, as people are still free to choose, however, they can influence people's decision through coordinated land use planning to reduce the distance and travel time.

In 2010, the State Government released the Directions 2031 document, a spatial framework for Perth and Peel, highlighting activity corridors to connect people and destinations in a coordinated and effective manner.

3.0 Context

The role of the bicycle has gained prominence at a national and State level, both in government and in the community. The benefits of cycling increase as the number of travel trips made from private motor vehicle transfer to bicycle increases.

The benefits relate to residents and patrons of the City, and contribute to the objectives of State and national governments. These benefits include (but are not limited to):

- *Personal Health*
- *Cleaner Communities* - reduced congestion, and reduced carbon footprint
- *Financial Savings* - to the individual, and transport and health related authorities

These benefits could be expanded to include the impact of the environment, the health system and social cohesion.

The diagram shown in Figure 1 indicates the framework that the bike plan study forms as part of a coordinated planning approach at all levels of government. It is important the planning for the bicycle network is aligned at local, state and national levels (refer to Appendix 1 for further detail on the objectives of the documents).

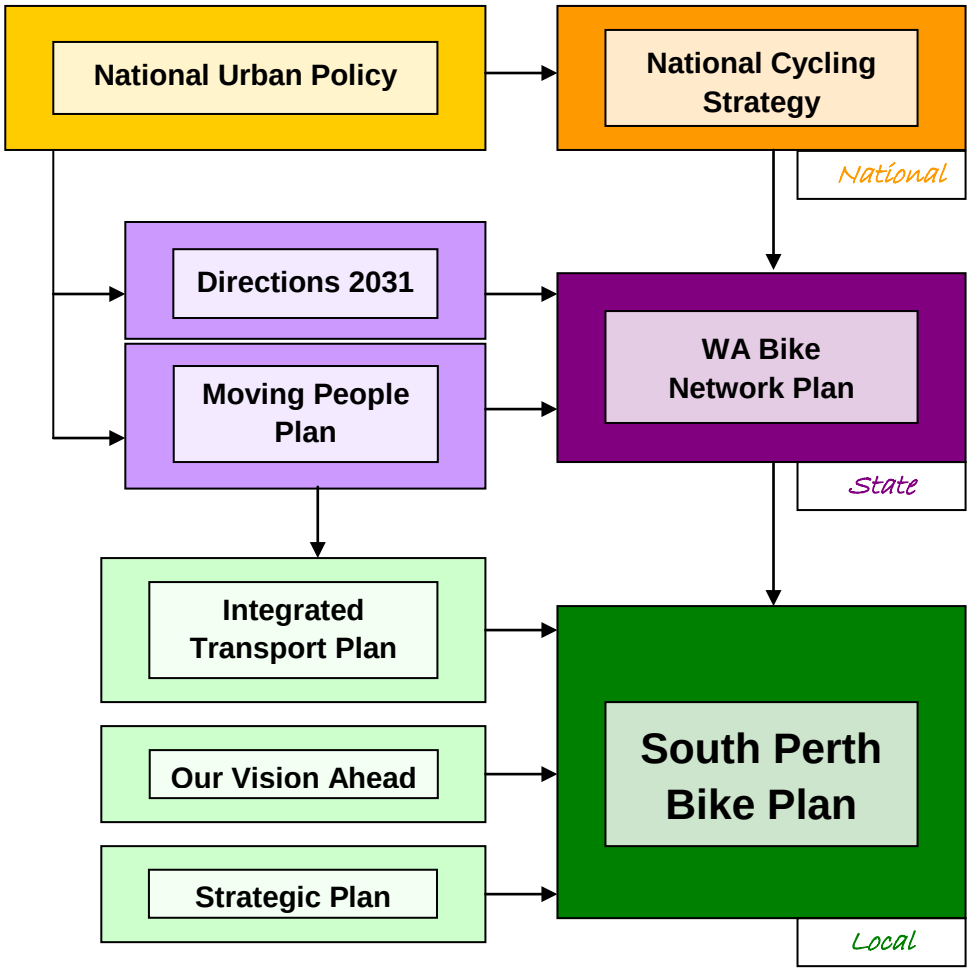


Figure 1 - Bike Plan Context

4.0 Current Bicycle Network

Although the City has one of the more developed bicycle networks in metropolitan Perth, it is deficient in some areas and there are some challenges to ensure it meets the standard to cater for increasing traffic movements predicted in the near future.

Planning for bicycle infrastructure in the City of South Perth can be traced back to 1981 (before the 1985 Perth Bike Plan), with the inclusion of a bicycle action plan into a road rehabilitation study. The first specific local bike plan was prepared in 1999, and then updated in 2005.

The current plan is therefore the third revision and builds upon the infrastructure that has been planned and implemented.

The Network

It should be accepted that people cycle:

1. On the existing *road* network
2. On a *path* network designated for cycling (hard surface or trail)

Certain roads have been designated as a bicycle route or consist of bicycle related infrastructure such as symbols.

The City of South Perth bicycle network currently is 51.7 km, and comprises:

- 35.8km on the road, and
- 15.9km of path.

The total length of road network is 198.1km [1] making the 35.8km on road bicycle network a significant 18% of the overall road network.

It needs to be recognised that the bicycle network is often shared with other modes of transport; for roads it is with motor vehicles, and for the paths it is with people walking. In both cases, separated facilities are desirable but not always practical.

Road Network Component

Substantial efforts have been made to make the existing road system safer for people to ride on. The City of South Perth has introduced 17.7 kilometres of sealed shoulder (pseudo bike lanes) to create space for people to cycle.

A further 15.5 km of on road route exists that does not have bicycle lanes but considered to be suitable width, and 2.6km of on road route is constrained and in some cases quite compromised.

The total 35.8km of on road route is made up of PBN local bicycle routes (29.6 km), and additional shared shoulders (6.2 km):

Refer to Appendix 2 for the bicycle lane database.

Path Network Component

Expanding the path network has been the focus of the City of South Perth to the benefit of its constituents and visitors. Special attention has been given to the upgrade of the path network in Sir James Mitchell Park to provide separate facilities for pedestrians and cyclists.

The 15.9km path network comprises:

- 8km Principal Shared Paths
- 6.4km Recreational Shared Paths
- 1.5km Path Connections (PBN Routes)

Refer to Appendix 3 for the path database

The 15.9km path network, includes 12.9km of shared path and 3km of cycle only path. A number of paths do exist that are not on PBN routes but have not been included due to the standard and location not being of suitable quality.

Perth Bicycle Network

Some of the road and path network has been identified as bicycle routes and thus form the current South Perth component of the Perth Bicycle Network. Based on these facts, the current PBN network is 45.5km (29.6km road +15.9km path).

The bicycle routes are separated into specific categories based on the purpose of the route and nature of the cycling environment:

- Principal Shared Paths (8km)
- Recreational Shared Paths (6.4km)
- Local Bicycle Routes (31.1km)

A map of the current network is on pages 15 - Figure 2.

Principal Shared Paths

Often denoted by its acronym, PSP, these are high standard routes developed on the freeway and passenger rail corridors to cater for the person cycling at high speed often for commuting purposes.

The sole PSP route in the City of South Perth is the *Kwinana Freeway PSP*. It runs along the western boundary of the freeway and adjacent to the river foreshore of Melville Waters.

8km of the 72km PSP route runs through the City of South Perth and at 230,000 cyclists per month [2], it is one of the busiest sections of Principal Shared Path in metropolitan Perth.

Main Roads have the responsibility of this path, but the route is an important component of the South Perth bicycle network; therefore the local authority has a vested interest in its standard and capacity.

Although the PSP is for the most part in a suitable condition, simple observation during peak time and awareness of user complaints, suggest the path capacity should be upgraded in the near future.

The State Government's recently released draft Western Australian Bicycle Network (WABN) Plan has earmarked this section for upgrade. Main Roads has indicated a potential upgrade of the section from Mill Point Road to Thelma Street in 2012/13.

Some of the other routes in the City of South Perth feed into the PSP. Connection points also become the responsibility of Main Roads but the identified improvements should be initiated by the City.

Future development proposed at the South Perth Train Station precinct should incorporate an increase in the capacity of the Principal Shared Path network, both for local pedestrian and bicycle movement, and movement into the Perth CBD.

Consideration should be given for an alternative commuter route on the eastern side of the freeway through this precinct and to the north.

Refer to page 19, Recommendations #3 and 4)

Recreational Shared Paths

Recreational shared paths are routes that have been identified along the coastline, rivers and areas of public open space. The primary purpose of a recreational path is to provide for cycling and walking as a leisure activity, or a low speed purpose journey.

The paths are in recreational areas and are often well removed from vehicle traffic, making a more pleasant cycling journey. This can be compromised if high speed commuter travel is not restricted from using these routes. Alternative routes should be provided, sign posted and enforced to prevent this.

There are currently two recreational shared path routes in the City of South Perth:

1. *Sir James Mitchell Park* on the foreshore of the Swan River, to the north of the South Perth council area. This path is one of the most popular in the State and as such has been separated for pedestrians and cyclists. The RSP route is 4km including the section adjacent to South Perth Esplanade.

2. *Waterford Foreshore* along the Canning River foreshore to the south of the council area. This route is largely underdeveloped and it could be some time before it provides a continuous connection from the Kwinana Freeway PSP to the eastern boundary at Centenary Avenue (outside the scope of this plan). This RSP route is 2.4km and proposed to extend east a further 0.4km to the City of Canning boundary as part of the Cygnia Cove development.

The plan focuses on the connections to the recreational paths rather than to improve the recreational path network. Some improvements are suggested on the Sir James Mitchell Park RSP route but the majority are to be delivered outside the 5 year timeframe.

Refer to Supplementary Report for details.

Local Bicycle Routes

Local bicycle routes are a series of signed on-road routes that connect major trip attractors, such as schools, shopping centres and community facilities. The routes are mostly on quiet suburban streets and are suitable for cyclists of all ages and experience.

Local bicycle routes were proposed in the 1996 Perth Bicycle Network Plan. 177 of these routes across metropolitan Perth had been identified through extensive planning and community consultation.

10 local bicycle routes had been identified in the City of South Perth.

- SE24 (Hurlingham Road and Banksia Terrace)
- SE27 (Coode Street Foreshore to Curtin University)
- SE28 (Angelo Street)
- SE29 (Coode Street Foreshore to Aquinas Bay)
- SE30 (Karawara to Berwick Street)
- SE31 (Labouchere Road)
- SE32 (Comer Reserve to Kensington)
- SE33 (PSP to Curtin University via Cale Street and Jackson Street)
- SE34 (Salter Point to Waterford)
- SE35 (Thelma Street)

Each of the 10 routes has been audited as part of the commission to Lamwise to undertake the report. The outcomes are included in the Supplementary Report.

A number of changes have been suggested to the routes (refer to pages 23-25) and important priority items are included in the 5-year program (refer to pages 34-42).

District Distributor Roads

Although not strictly part of the former PBN network, district distributor roads are often direct and potentially provide a convenient route for people cycling, especially the confident and experienced.

The draft WABN Plan has prioritised on-road cycling on the distributor road network (refer to WABN Plan - Section 7.4, page 23).

The City of South Perth contains a number of important roads on the functional hierarchy (excluding freeways):

- Canning Highway (Primary Distributor)
- Manning Road (District Distributor A)
- Labouchere Road (District Distributor B)
- Mill Point Road (District Distributor B)

Local distributors have not been included, since they are more appropriate as *local routes*.

To reflect the priorities of Directions 2031 and importance to the strategic network outside the local area, these roads should be the focus of improvement in the longer term or as the opportunity arises.

With the exception of Labouchere Road, these distributor roads are currently not suitable cycling environments. Site constraints prevent easy modifications to install bicycle lanes but should the opportunity arise to modify the cross-section of these roads, suitable cycling facilities are to be incorporated.

Refer to page 22, Recommendations #9-11.

Canning Highway is the major barrier that dissects the City of South Perth. The road environment is highly unsuitable for cycling and also poses major safety and convenience concerns for pedestrians and cyclists attempting to cross the highway.

Canning Highway is undergoing a road reservation and MRS amendment. The City of South Perth should take the position that incorporates provision for suitable cycling infrastructure on the proposed reservation. In this case either bicycle lanes or shared bus/bike lanes should be proposed. There are no suitable alternatives to the direct route that Canning Highway could provide for commuter cycling.

Manning Road could provide an important east-west cycle link from Canning Bridge to Curtin University in the longer term. Both of these locations are two activity centres of strategic importance to the metropolitan area. The City of South Perth should ensure that cycling provision on Manning Road is not ruled out in future plans, regardless of other routes implemented in the adjacent area.

Manning Road could have some improvement to the path network on both sides in the longer term (not proposed in the 5-year timeframe of this plan).

Labouchere Road has bicycle lanes for the majority of the route and provides an important north-south cycle link from Canning Highway to Angelo Street / Richardson Park. These lanes stop short of Perth Zoo, a strategic activity centre (metropolitan attractor).

This deficiency should be rectified in the near future. The South Perth Station Precinct development should propose improvements to the section of Labouchere Road from Angelo Street to Mill Point Road for cyclists and extend the bicycle route to the north. The route should be developed through to South Perth Peninsula (to connect to the Narrows Bridge and PSP).

Mill Point Road currently does not have provision for cyclists to the west of Coode Street. This is a deficiency to be rectified due to the conflict that currently exists between pedestrians and cyclists on the recreational shared path network through Sir James Mitchell Park.

An alternative route is needed to be established for commuter cyclists and Mill Point Road is considered a potential option but due to the site constraints and competing priorities for Mill Point Road, establishing a suitable route presents a serious challenge. Further detailed investigation is required to this specific site to design and construct appropriate facilities.

The design of such a facility needs to take into account the potential increase of vehicle traffic movements on Mill Point Road once the Riverside Drive modifications are introduced as part of the Waterfront Project.

[1] Western Australian Local Government Directory, 2009

[2] Department of Transport website http://www.transport.wa.gov.au/activetransport/25855.asp

5.0 Deficiencies

Based on a network audit and community comment, the deficiencies of the current bicycle network can be summarised as follows:

- *East-west connections* (refer to page 26, Recommendation #15)
- *Connections to Curtin University* (refer to page 23, Recommendation #12)
- *Connections to Canning Bridge Station* (refer to comment on page 23)
- *Safety through Sir James Mitchell Park* (refer to comment on page 21)
- *Access to Narrows Bridge* (refer to pages 20-21, Recommendation #5)
- *Mill Point Road west of Coode Street* (refer to page 22, Recommendation #9)
- *Labouchere Road north of Angelo Street* (refer to page 22, Recommendation #9)
- *Mitchell Freeway PSP* (refer to page 19, Recommendation #3)
- *End of Trip provision* (refer to pages 31-33, Recommendations #21-23)
- *Recreational Shared Path – South Perth Esplanade / Mends Street* (refer to page 21, Recommendation #6)
- *Recreational Shared Path – Waterford eastern connection* (refer to comment on pages 11 and 29)
- *Coode Street between South Terrace and Thelma Street* (refer to page 26, Recommendation #15)
- *Shared paths behind Como Senior College (SE30)* (refer to page 26, Recommendation #15)
- *SE30 on Murray and David Streets* (refer to page 26, Recommendation #15)
- *Canning Highway* (refer to page 22, Recommendation #11)
- *Manning Road* (refer to page 22, Recommendation #10)
- *Canning Bridge* (refer to page 29, Recommendation #18)

Data collection, although separate to network infrastructure is another deficiency identified that needs to be addressed (refer to page 27, Recommendation #16).

The update of an *Integrated Transport Plan*, is recognised as a deficiency identified that needs to be addressed (refer to page 18, Recommendation #2).

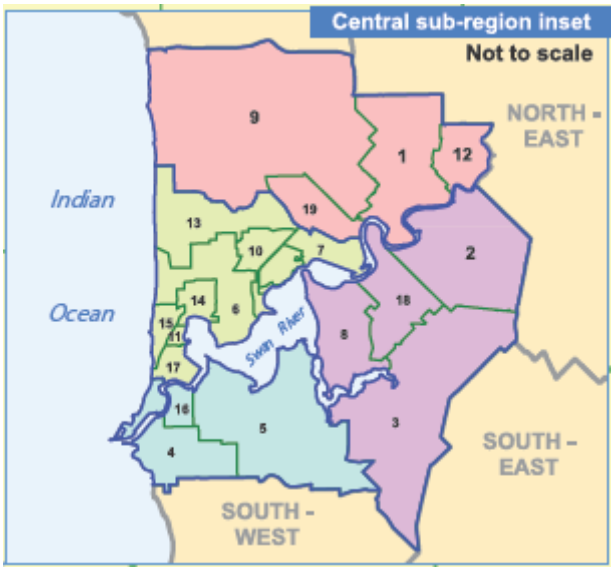
Note that some of the deficiencies are not proposed to be addressed in the 5-year program of the Bike Plan, nevertheless the recommendations for future action is referenced.

Figure 2 - Existing Bicycle Network + Deficiencies

6.0 Planning Considerations

In 2010, the State Government released the Directions 2031 final report, which provides the State with a strategic plan and spatial framework for the metropolitan Perth and Peel region. Due to the size and complexity of strategic planning for the metropolitan area, a central metropolitan sub-regional strategy and an outer metropolitan Perth and Peel sub-regional strategy are being prepared.

The City of South Perth is one of the 19 metropolitan local government authorities that make up the central sub-region, and along with the Town of Victoria Park, City of Belmont and City of Canning, make up the south-east quadrant of the sub-region.



1	City of Bayswater
2	City of Belmont
3	City of Canning
4	City of Fremantle
5	City of Melville
6	City of Nedlands
7	City of Perth
8	City of South Perth
9	City of Stirling
10	City of Subiaco
11	Shire of Peppermint Grove
12	Town of Bassendean
13	Town of Cambridge
14	Town of Claremont
15	Town of Cottesloe
16	Town of East Fremantle
17	Town of Mosman Park
18	Town of Victoria Park
19	Town of Vincent

Figure 3 - Central Sub-Region (Directions 2031)

Directions 2031 predicted an additional 6,000 houses are to be planned for the City of South Perth to make up the target of 121,000 additional houses in the central sub-region in 2031. This increases the total to 26,167 houses proposed in South Perth and is to have an impact on the transport network.

Directions 2031 indicated the locations of activity centres across the metropolitan area:

Strategic Metropolitan Centres: None of the four centres identified are in the City of South Perth, but one is in the close vicinity - Cannington. Partnership required with the Town of Victoria Park and City of Canning to develop routes to this centre.

Specialised Centres: The Bentley / Curtin centre (Curtin University, Bentley Technology Precinct) abuts the City of South Perth and has a major impact on the transport network of the South Perth local government area. Two of the three other centres (Perth Airport and Murdoch University / Fiona Stanley Hospital) are in the near vicinity and should be considered for future transport links in partnership with the relevant local government authorities along the route.

Secondary Centres: None in the City of South Perth, but in the close vicinity of Belmont (partnership required with the Town of Victoria Park and City of Belmont to develop routes to this centre) and Booragoon (partnership required with the City of Melville to develop routes).

District Centres: Canning Bridge is one of the district centres identified and is largely in the City of South Perth. South Perth is a district centre that is completely in the City of South Perth. Creating a suitable transport network to these centres are therefore a priority for the City of South Perth.

Metropolitan Attractor: The Perth Zoo is one of the metropolitan attractor that is in the City of South land use area and has an impact on the transport network as a trip generator.

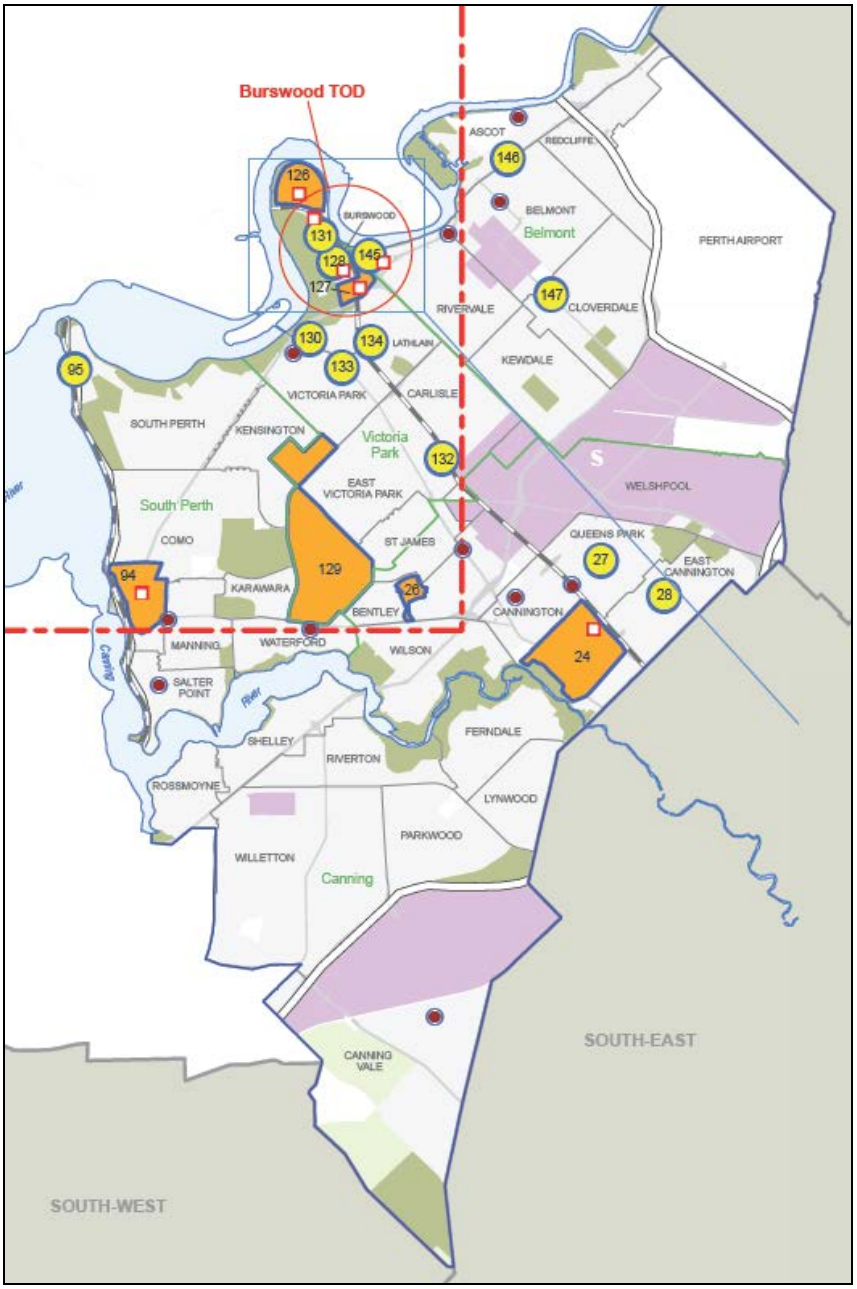


Figure 4 - City of South Perth Growth Areas (Quadrant 4, Directions 2031)

Table 1 outlines the activity centres that are in or adjacent to the City of South Perth:

Activity Centre	Type	Location
Canning Bridge	District centre	Largely in CoSP*
Perth Zoo	Metropolitan attractor	Completely in CoSP
Bentley / Curtin	Specialised centre	Abutting CoSP (in ToVP*)
Cannington	Strategic metro centre	City of Canning (via ToVP)
Belmont	District centre	City of Belmont (via ToVP)
South Perth	District centre	Completely in CoSP
Perth Airport	Specialised centre	City of Belmont (via ToVP)
Murdoch & FSH*	Specialised centre	City of Melville (via PSP*)

* CoSP = City of South Perth, ToVP = Town of Victoria Park, PSP = Principal Shared Path

Table 1 - Activity Centres Relating to City of South Perth

One of the key priorities of the South Perth Bike Plan 2012-17 is therefore to create a cycle route from the proposed Canning Bridge Precinct area to the Belmont Technology / Curtin specialised centre in order to provide an efficient transport network in the vicinity of these planning growth areas. Other areas predicting growth and generating significant trips such as the South Perth Station Precinct are also considered in the proposed bicycle network for South Perth.

To meet the requirements of Directions 2031, the City of South Perth and the Department of Planning has prepared the South Perth Station Precinct Plan and the Canning Bridge Precinct Vision.

These and all other proposed planning developments should also include provision for cycling on the proposed modifications to the transport network.

Recommendation #1:

Ensure the planning for South Perth Station Precinct, Canning Bridge Precinct, and other locations of strategic importance, incorporate cycling provision in the transport network plans and eventual modifications.

Integrated Transport Plan

The South Perth Bike Plan 2012-17 does not presume to take on the role of an Integrated Transport Plan, but considers the bicycle network component of the overall transport network, and prioritises a network to be developed over the short term (to 2017).

It is essential that a longer term transport plan incorporating land use plans and integrating other components of the transport network (public transport in particular) be prepared and adopted by the City.

Recommendation #2:

The City of South Perth to produce an up to date Integrated Transport Plan, focusing on 'Moving People' to provide policy measures and guide transport planning for the longer term (15-30 years).

7.0 Proposed Bicycle Network (Vision)

It is appreciated that infrastructure funding has to be prioritised and the ideal bicycle network can not be achieved in the next 5 years. The responsibility of local and State Government is to use the available funds in an efficient manner and develop the network to the best possible state it can be in that time.

This plan outlines the desired network and sets out a prioritisation of works to improve the network to the best possible standard by 2017.

The proposed route classification:

- Principal Shared Path (PSP) Route
- Recreational Shared Path (RSP) Route
- Distributor Road Route
- Priority Bike Route: Important connections on local roads
- Local Route: Other connections on local roads

Principal Shared Path

Over the next five years, there are expected to be modifications to the PSP network. The current PSP is expected to exceed the capacity for pedestrians and cyclists.

Recommendation #3:

Communicate with Main Roads WA about forthcoming improvements to the Kwinana Freeway PSP between Narrows and Mt Henry Bridges (as outlined in the WABN Plan).

Duplication appears to be unfeasible due to environmental restrictions. An alternative could be considered for commuters cycling from the City of South Perth into Perth CBD to avoid increasing the volume of users on the PSP. Potential issues to a route on the eastern side of the Freeway are the grade separation at Mill Point Road.

Recommendation #4:

Consider the development of a route to Perth CBD on the east side of the Kwinana Freeway.

Recreational Shared Path

A number of improvements are recommended for the Swan River Recreational Shared Path route. Some are suggested within the 5-year time frame and included in the Infrastructure Implementation Plan (pages 34-42), while others are identified for future attention beyond 2017.

The connection to the Narrows Bridge has been identified as a priority to be addressed in the 5-year timeframe. Details are provided in the Supplementary Report, pages 107-108 (and Figure 5 below).

Figure 5 – Connection to Narrows Bridge (east side)

The connection to the Narrows Bridge on the west needs some immediate simple improvement as shown in Figure 6 on the following page.

Longer term potential treatments are proposed in the Supplementary Report.

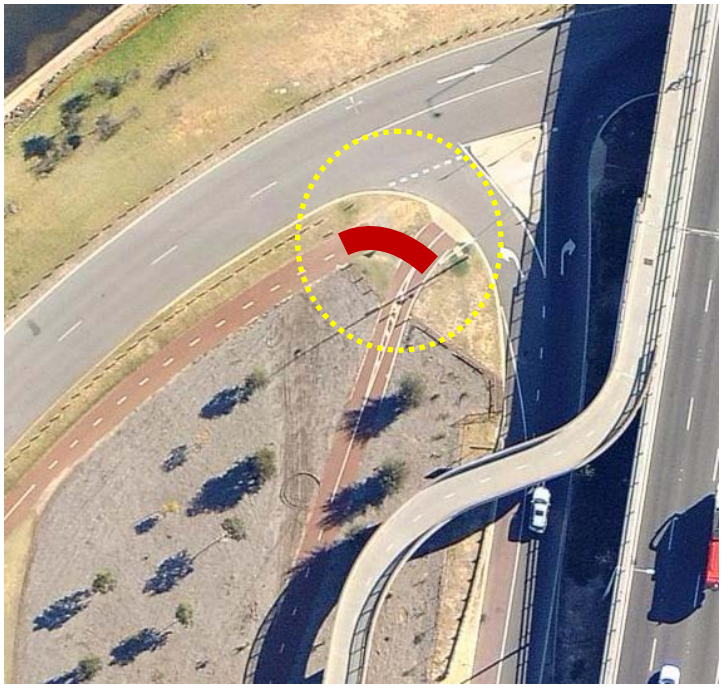


Figure 6 – Connection to Narrows Bridge (west side)

Recommendation #5:

Implement improvements to the connections to Narrows Bridge from the east and the west.

South Perth Esplanade in the vicinity of Mends Street needs specific improvement. The turnaround area at the bottom of Mends Street should be removed

Recommendation #6:

Improve the safety and accessibility for cyclists on South Perth Esplanade through the Mends Street intersection by removing the turnaround area at the bottom of Mends Street.

Potential improvements to the South Perth Esplanade are identified in the Supplementary Report (pages 104-111) but are not scheduled in the Implementation Plan of the 5-Year Program. The program should be flexible to allow the City to incorporate these works into the 5-year timeframe should the opportunity arise or demand require it.

The safety of shared path users and members of the public using the Sir James Mitchell Park facilities is a recognised concern. The separation of the pedestrian and cyclists needs to be maintained. Slow points could potentially be installed on the cycle only path should users continue to ignore signage to ride at appropriate speeds. Alternative routes should be considered for commuters. Lighting and improved signage should be implemented in the 5-year timeframe.

Recommendation #7:

Install lighting and improve signage on Sir James Mitchell Park.

The recreational shared path crossing points of Coode Street are also a recognised concern requiring attention. Priority should ultimately be provided to path users, and treatments to slow vehicles should be installed.

Recommendation #8:

Install slowing devices on Coode Street where the recreational shared path intersects. Provide priority to path users over vehicles. Further investigation should be carried out to determine the safety and practicality of these treatments.

Improvements to the Waterford Recreational Shared Path are not suggested, since the extension to the east is being carried out as part of the development of Cygnia Cove (refer to page 29).

Distributor Road

The proposed network suggests improvements for cycling facilities on distributor roads be focused on Labouchere Road and Mill Point Road in the north-west quadrant where these roads intersect (refer to map on page 28).

Recommendation #9:

Undertake traffic study and design of bicycle provisions on Mill Point Road (west of Coode Street) and Labouchere Road (north of Angelo Street) to take into account the impact of the Riverside Drive closure.

Shared paths on sections of Manning Road should be considered on the basis that Manning Road becomes a priority bicycle corridor. These upgrades are not proposed in the 5-year works program

Recommendation #10:

Manning Road to be considered for shared path upgrades beyond 2017 unless opportunity or demand arises to bring them forward into the 5-year program.

Remaining distributor roads should be considered for cycling treatments as the opportunity or demand arises.

Recommendation #11:

The City of South Perth to focus on the improvement of cycling facilities along Distributor Roads (District and Primary) in the longer term (15 - 30 years) and to include provision of adequate cycling facilities as opportunities arise to plan or construct.

Priority Bike Route

The South Perth Bike Plan 2012-17 proposes one priority bike route between Canning Bridge Station and Curtin University. This route is essentially an enhanced local bicycle route for direct commuter cycling use. Further priority bike routes should be considered for development beyond the 5-year program.

Recommendation #12:

Implement the Canning Bridge Station to Curtin University Route as a priority in the 2012-17 timeframe.

Given the importance of this route, consideration for a route on Henley Street and a section of shared path on Canning Highway should be made for cycling to Curtin University.

Local Bike Route

The South Perth Bike Plan 2012-17 has considered the 10 routes as to their connectivity to activity centres and as destination- based rather than distance-based. The routes that are more important on this basis are to be enhanced.

Since the time of the routes identification, traffic volumes on some of the roads are sure to have increased and the function of the routes needs to adapt to the present planning context (refer to section 3).

A desktop review of the alignment of the routes indicated that a number of changes were necessary in the short term to the local bike network:

1. SE28 to be extended west from Labouchere Road to the Kwinana Freeway PSP (transferring this section from SE31)

2. SE29 to continue on Coode Street from Thelma Street to the Recreational Shared Path (this section is currently not shown on maps due to constrained site and inadequate facilities)

3. SE30 to be maintained but consideration for a change from Murray and David Streets to Bland Street (north of Thelma Street) – further development required for this route.

4. SE31 to be extended at the southern end along Cale Street and Leonora Street to connect to Canning Bridge Station (the northern extension is proposed in the District Distributor section above)

5. SE33 to be relocated from Cale Street to Davilak Street to provide an important connection from Canning Bridge to Curtin University (it is proposed to retain the previous alignment on Cale Street to Canning Highway as a spur; Cale Street west of Canning Highway to become part of SE31)

6. SE34 has been extended at the eastern end up Kent Street to Curtin University (transferring this section from SE27 and retaining the connection to the Waterford foreshore as a spur)

7. SE34 to have a change to use Kilkenny Circle and Carrick Way rather than the path connections and Dungarvan Court to keep the route on road.

8. SE35 to be extended west from Labouchere Road to the Kwinana Freeway PSP.

9. SE27 has been reduced to end at Curtin University (the route changes to SE34 south of Curtin University - see #6 above).

The route changes had to be verified on site, and specific improvement works were identified to make the routes a suitable standard.

Refer to map on page 25 – Figure 7.

Recommendation #13:

Implement the suggested changes to the local bike network in the 5-year program of the Bike Plan.

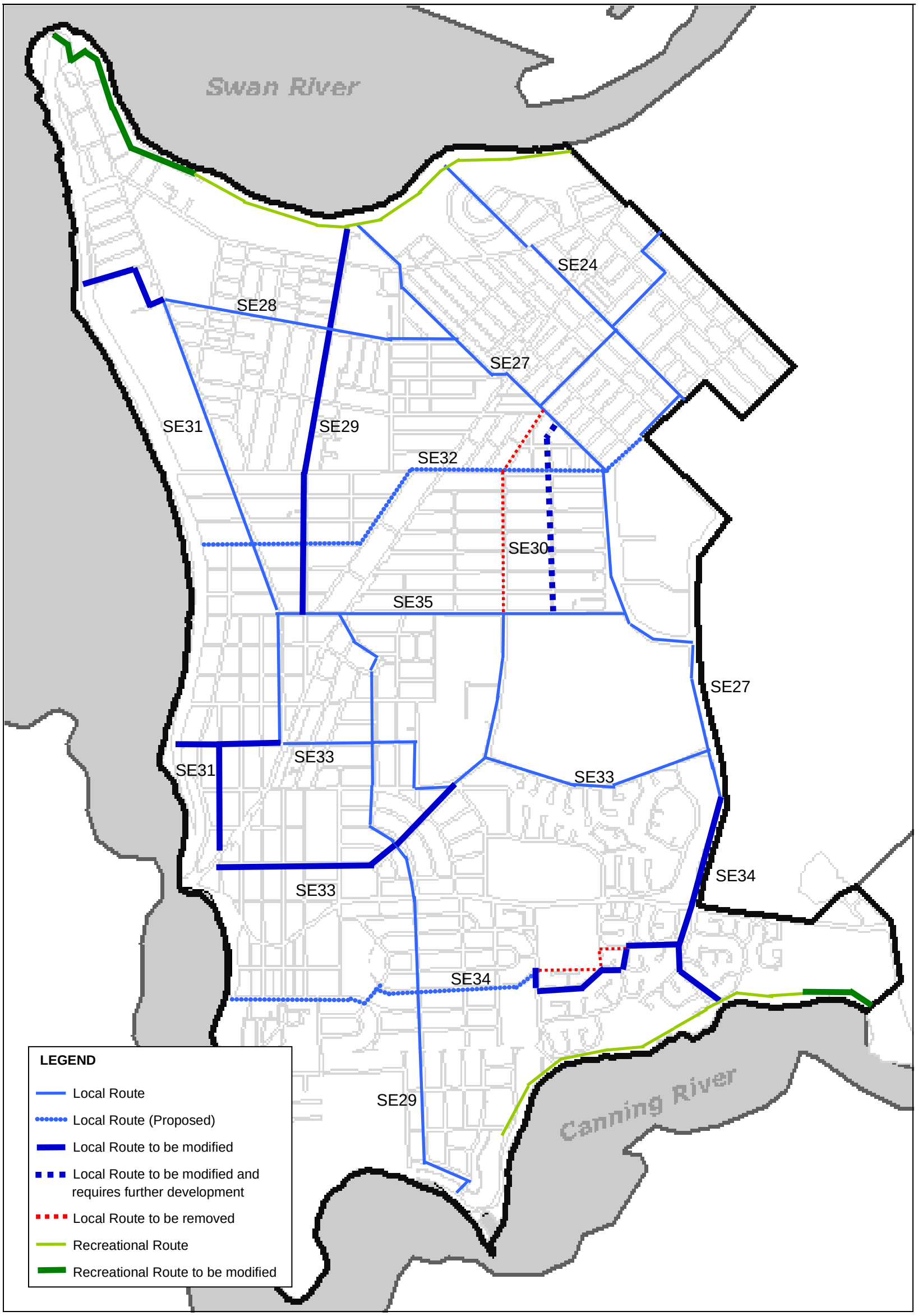


Figure 7 - Recreational + Local Bicycle Route Network + Changes

It is proposed that the local route language denoted in previous local bike plans (e.g. SP4, SP5 etc.) be discontinued.

Recommendation #14:

Remove references to "SP" routes identified in previous South Perth plans.

After route changes are implemented, some local routes have been proposed to be enhanced. This can be achieved by addressing the items identified in the infrastructure audit (refer to Supplementary Report).

These are the routes proposed for upgrades to be undertaken in the 5-year time frame of the plan.

- SE28 (South Perth Station Precinct and Angelo Street)
- SE27 (Douglas and Hayman Streets: Coode Street Foreshore to Curtin)
- SE29 (northern section) (Coode Street: Thelma Street to Foreshore)
- SE30 (southern section) (Henley to Murray)
- SE31 (northern section) (Labouchere Road: Thelma Street to Perth Zoo)
- SE33 (Canning Bridge to Curtin University)
- SE35 (Thelma Street: PSP to Hayman Road)

These routes have been chosen on the following basis:

1. The City of South Perth has indicated a decisive focus on the enhancement of the local routes that span in an east-west direction across the local government area. This reflects the outcomes of transport studies [2] and community consultation. In essence, these routes form an enhanced local route to provide an additional tier in the bicycle network lattice.
2. These routes also provide a connection to the activity centre precincts such as Bentley Technology / Curtin Specialised Centre, South Perth Station Precinct and the Canning Bridge Precinct.

The infrastructure implementation plan for upgrading the bike routes is detailed in Section 10 of this report (pages 34-42). The implementation plan includes some spot improvements to SE24 (Canning Highway underpass).

For more details on the routes and proposed infrastructure improvements refer to the Supplementary Report. A map of the proposed network is on page 28 - Figure 8.

Recommendation #15:

Implement the proposed works identified to improve the abovementioned routes (as per Section 10 of this report).

Existing routes not scheduled for improvement over the next five years need to be protected and considered in future planning.

Project Specific Designs

An important aspect of the bicycle network vision is the development of project specific plans and designs; and audits of specific functions to enhance the network for the longer term. These include:

- The investigation and design of bicycle facilities on Mill Point Road to form commuter bike route to separate high speed cycling from facilities on Sir James Mitchell Park
- Investigation and design of bicycle facilities on Labouchere Road adjacent to the Perth Zoo (to be undertaken as part of South Perth Station Precinct planning).
- Impact of the South Perth Station Precinct proposal on the current PSP to the Perth CBD (for pedestrians and cyclists)
- Partnership with Main Roads and Public Transport Authority to plan and prioritise the improvement of facilities in and around Canning Bridge Station
- Incorporation of bicycle facilities on the proposed amendment of the Canning Highway MRS (Worley Parsons engaged by Department of Transport)

The above are incorporated in Recommendations #1 and #6 (pages 18 and 22).

Data Collection

In order to effectively evaluate the network and prioritise further investment, bicycle count data should be obtained. Particular data is necessary on the highly used Sir James Mitchell Park Recreational Shared Path.

Recommendation #16:

Obtain bicycle count data on specific sites (to be determined).

Education / Behavioural Change

The South Perth Bike Plan 2012-17 is primarily a network plan, but recognises the roll that educational and behavioural change programs have in creating a cycling culture.

City staff should partner with Department of Transport, Active Transport staff and relevant Heart Foundation staff to provide information to the public about cycling benefits and behaviour requirements.

Recommendation #17:

Partner with the Department of Transport and Heart Foundation on education and behavioural change programs.

[2] Transport studies include:

- South Perth Integrated Transport Plan (2006)
- Curtin University Bentley Transport Study, Cardno Eppell Olsen (2009)

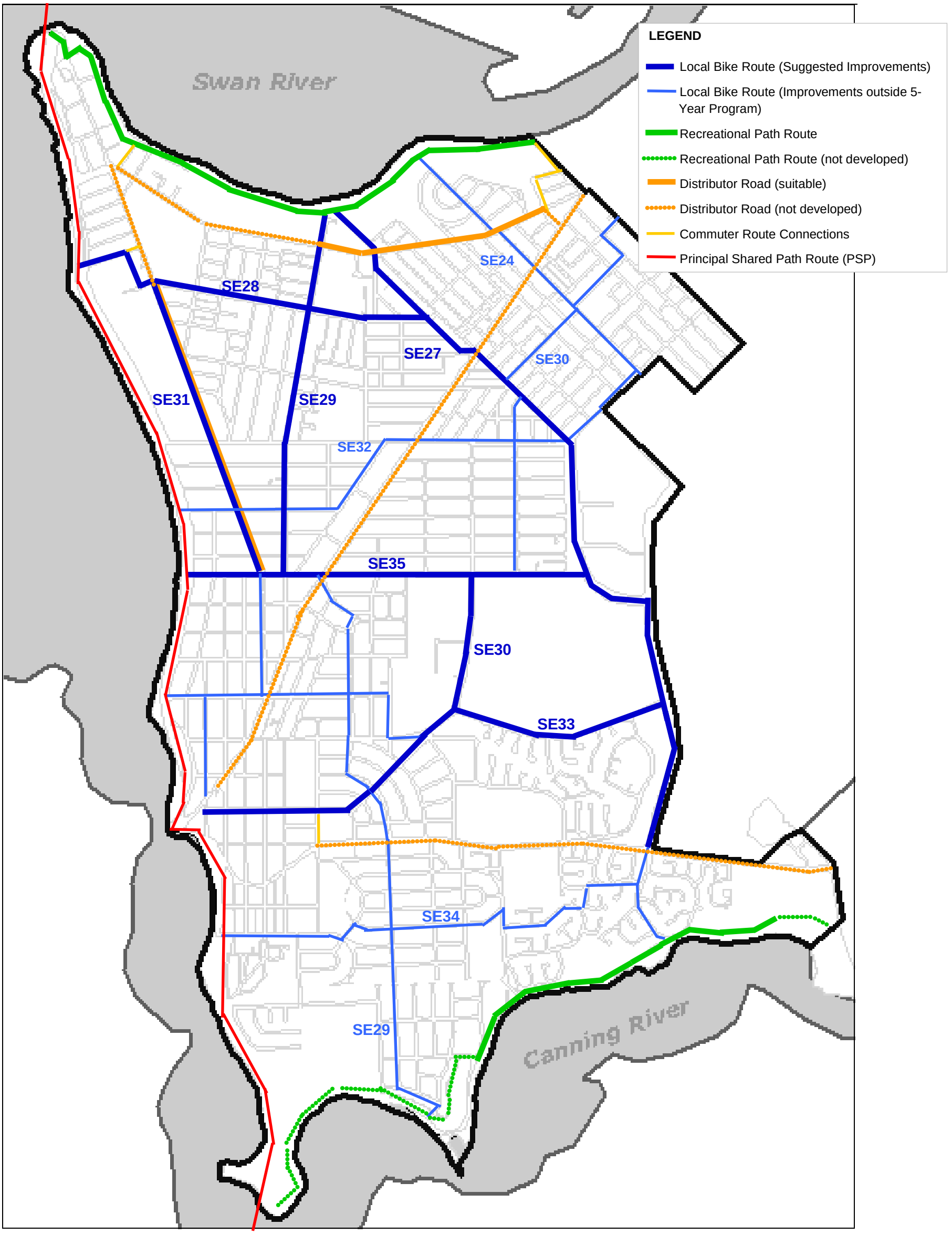


Figure 8 - South Perth Bicycle Network (Proposed Vision 2017)

8.0 Connections to Adjacent Councils

There are four local authorities that connect to the City of South Perth:

- City of Perth
- Town of Victoria Park
- City of Canning
- City of Melville

With the exception of the Town of Victoria Park, the connections to these local authorities are predominately across water (Swan and Canning Rivers) thereby making bridge structures the only means for providing connections.

The *Narrows Bridge* provides the connection into the City of Perth. There are cycling facilities on both sides of the bridge, but the western side of the bridge has been built to a better standard.

The *Causeway* and *Windan Bridge* (Graham Farmer Freeway) provide connections into the City of Perth from the east. These do not directly connect from the City of South Perth but pass through the Town of Victoria Park. The connections to the Town of Victoria Park should consider the ultimate destination of the City of Perth. It should be noted that the Causeway does not have adequate facilities for cyclists, but options to improve are difficult and expensive.

Canning Bridge and *Mt Henry Bridge* provides the connections into the City of Melville. Facilities on Canning Bridge are poor and difficult to improve, while the facilities on Mt Henry Bridge are suitable. These bridges are outside the responsibility of the City of South Perth and are the responsibility of Main Roads WA.

Recommendation #18:

Liaise with the Public Transport Authority and Main Roads regarding Canning Bridge access, and consider in the proposed Integrated Transport Plan and other planning studies relevant to the site.

Land Connections

The boundary to the City of Canning is along a small pocket of land in the South East of the City area. The boundary runs along McKay Street and Centenary Avenue, and a small portion of reserve.

Connections to be focused on the following:

1. Manning Road (shared paths)
2. Recreational Path on Canning River (north side).

Improvements to the above are being implemented as part of the development of Cygnia Cove.

Starting from south to north, there are a number of connections to be considered with the adjacent Town of Victoria Park.

3. Kent Street – Connections to Curtin University

Crossings of Kent Street to access Curtin University should be protected and improved where practical. Measures to slow down traffic on Kent Street in this location should be supported.

Recommendation #19:

Support measures to slow vehicle traffic speed of Kent Street to improve access points into Curtin – Bentley Specialised Centre.

Curtin University has recently produced the Curtin – Bentley Specialised Activity Centre Plan, which includes the Curtin Town Structure Plan. Cycle routes in and through Curtin University are indicated in page 46 of the Curtin Plan. Curtin University are also proposing to undertake a Curtin Bike Plan in the near future.

The City of South Perth should become familiar with these plans and liaise with the Curtin University Properties Department to collaborate on the implementation of connection points.

4. Hayman Road and Kent Street intersection

The roundabout is an important junction for transport but is currently unsafe for cyclists. Double lane roundabouts are difficult and often dangerous for cyclists. No measures are proposed as part of this plan but should be investigated further or be considered if the opportunity arises.

5. Baron-Hay Court and George Street

These roads border both Councils and should be preserved as a bicycle route. Opportunities to upgrade cycling facilities on these roads should be taken advantage of. Jarrah Road becomes an important route for the Town of Victoria Park and it has programmed to install bicycle lanes along the extent of this route in 2012-13.

6. Anketell Street

Anketell Street provides a popular connection to the Town of Victoria Park through the path in Harold Rossiter Park.

7. Second Avenue

Second Avenue provides the connection on SE30 into the Town of Victoria Park and should be preserved as bicycle priority.

The Recreational Shared Path on the Swan River becomes an important connection into the Town of Victoria Park. The Town of Victoria Park recently improved the path connection east of Ellam Street to make this route a suitable connection.

Recommendation #20:

Liaise with the Town of Victoria Park and Curtin University regarding each of the abovementioned connections.

9.0 Bicycle Parking

An often overlooked aspect of bicycle network planning is the provision of end of trip facilities, most notably bicycle parking at specific destinations. Other components of end of trip facilities include showers, storage lockers and change rooms.

Despite the network being safe and extensive, the lack of adequate parking can be a deterrent to potential trips being done by bicycle.

Shopping Precincts

Shopping areas, especially cafes frequently used by cyclists, are the locations that are the focus of attention in the current plan. Flexibility is required to the proposed recommendations in this section based on the demand in the community.

Bike Corrals are a new treatment starting to be implemented around the world, whereby parallel car bays are converted into bicycle parking. Local governments in inner Melbourne have had success implementing them.

A number of shopping precincts are somewhat deficient in the provision of bicycle parking and should include additional U-rails as detailed below.

- Mends Street Precinct (Dome Café x 5): U-Rails to be installed on east side in addition to existing.
- Mends Street Precinct (Atomic Café x 5; Mends St Café x 5): Reclaim one car bay mid-block for the U-Rails on west side.
- Angelo Street Precinct (Bocelli Café x 2; Globe Coffee House x 2): U-Rails on north side.
- Preston Street Precinct (closer to IGA entrance x 2): Current U-Rails off-site and too far from entrance to be desirable. Approval required from centre management to potentially remove car bay to install bike parking.
- Canning Highway / Douglas Avenue intersection (northern quadrant x 2).
- Canning Highway / Barker Avenue intersection (Deli x 1).
- Install 2 additional U-Rails at the front of George Burnett Recreation Centre

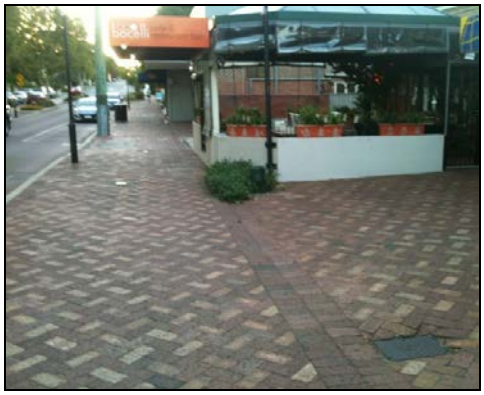
Recommendation #21:

Implement the additional bike parking at the abovementioned locations.

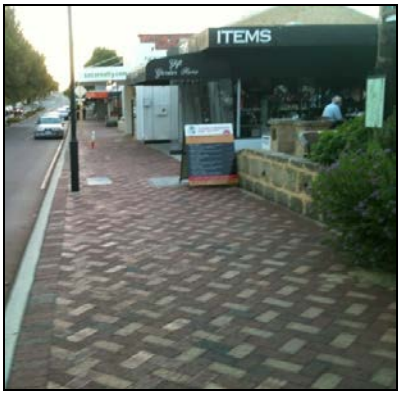
Mends Street - Atomic Cafe

Mends Street - Mends St Cafe

Mends Street - Dome Cafe



Angelo Street Precinct - Bocelli Café



Angelo Street Precinct - Globe Coffee

Preston Street Precinct - IGA

Canning Hwy / Douglas Ave

Canning Hwy / Barker Ave

Schools

Future studies to target school children should be undertaken by the City of South Perth. An audit of bike parking facilities at all schools in the City of South Perth could be carried out in conjunction with an audit of the path network. The Town of Victoria Park undertook an audit of this kind in 2009.

Recommendation #22:

The City of South Perth to undertake audit of bike parking provision at schools and the path network around the schools and the residential areas.

Town Planning Scheme Requirements

One of the important means to ensure bicycle parking is installed appropriately across the network is through the provision recommendations in the local town planning scheme (City of South Perth Town Planning Scheme No. 6).

10% of employers should be the level of parking required, especially for businesses closer to the Perth CBD. Showers and clothes / storage lockers also need to be provided. Best practice should be consulted over and above Austroads guidelines to create a shift in the amount of people cycling for transport.

Recommendation #23:

Undertake a review of the City of South Perth Town Planning Scheme No 6 to ensure the bike parking provision recommendations reflect current best practice.

10.0 Infrastructure Implementation Plan

Details of the required works for each route are in the Supplementary Report. This section provides an incremental plan to achieve the 5-year vision for the South Perth bicycle network.

Priority 1 Projects (2012/13)

The priority for the first year of the program is to construct the important connections to develop the high standard route from Canning Bridge to Curtin University (SE33).

At the same time, design plans are to be prioritised for the key missing sections of bicycle network on district distributor roads: Mill Point Road and Labouchere Road.

Route	Location	Treatment	Details
SE33	Canning Highway to Davilak Street	Upgrade Shared Path	Install 3m red asphalt shared path
SE33	Henley Street to Jackson Road (Curtin Cycle Link)	Construct New Cycle Path	Install 3.5m red asphalt cycle only path to connect the realigned Henley Street crossing to Jackson Road
Mill Point Road	Harper Street to Coode Street	Traffic Study and Design of Bicycle Provision	Undertake traffic study for Mill Point Road to determine impact of Riverside Drive closing, and design for bicycle lanes or suitable cycling provision on Mill Point Road to divert commuter (high speed cyclists) from Sir James Mitchell Park.
Labouchere Road	Angelo Street to Mill Point Road	Traffic Study and Design of Bicycle Provision	Undertake traffic study for Mill Point Road to determine potential for bicycle lanes or suitable cycling provision on Labouchere Road to continue route SE31 north to connect to Perth Zoo and the Mends Street precinct.
Bike Parking	Mends Street	Install 15 U-Rails	Convert car bay into 5 U-Rails Replace old rails and install 10 U-Rails at suitable locations

Table 2 – Implementation Plan – Projects 2012/13

Priority 2 Projects (2013/14)

The priority for the second year of the program is to complete the route SE33 from Canning Bridge to Curtin University. To provide an additional connection to Canning Bridge Station, a shared path upgrade is proposed on Canning Highway south of Henley Street.

Route	Location	Treatment	Details
SE33	Jackson Road	Construct New Cycle Path	Install 3.5m red asphalt cycle only path to the north of Jackson Road to consider competing priorities.
SE33	Henley Street Crossing (Godwin Avenue)	Relocate Crossing and Construct Shared Paths	Move crossing to the west to improve site distance (locate at the bend of Henley Street) Construct 3.5m red asphalt path to connect Godwin Avenue to the crossing
Canning Bridge Station Connection	Canning Highway Henley Street to Freeway on-ramp	Upgrade Shared Path	Install 3m red asphalt shared path on south side of Canning Highway. Some large vehicle signage needs to be modified / relocated
Bike Parking	Overall Network	Update the City Town Planning Scheme No. 6	Consider bicycle parking and end of trip facility requirements as part of the scheme to reflect best practice and goals of transport network in the medium to long term (refer to page 33)
Bike Parking	Schools	Audit of Schools Bicycle Parking and Path Network	Consider bicycle parking at the schools in the City of South Perth and the path network and schedule necessary upgrades to encourage school age children to use bicycle for transport

Table 3 – Implementation Plan – Projects 2013/14

Priority 3 Projects (2014/15)

The priority for the third year of the program is to address some of the infrastructure deficiencies (Coode Street, and the eastern end of Mill Point Road).

The northern portion of route SE29 is to be enhanced.

Route	Location	Treatment	Details
SE29	Coode Street South Terrace to Thelma Street	Reconstruct Road to Provide Bicycle Lanes	Widen carriageway to install 1.2m red asphalt bicycle lanes on both sides of Coode Street. The main sections to address are the median island squeeze points.
Mill Point Road	Douglas Avenue to Way Road	Red Asphalt Lanes	Resurface lanes to red asphalt
Mill Point Road	Approach to Way Road (east bound)	Continue Bicycle Lanes	Provide red asphalt cut throughs at squeeze point to provide safe bypass for cyclist (current treatment requires detour on private driveway and compromised concrete shared path)
Mill Point Road	Crossing at Way Road (west bound)	Green asphalt crossing	Improve crossing and raise awareness of commuter cycling route by green asphalt surface (see photo MPR-3 in Supplementary Report)
Mill Point Road	Connection to Heppingstone Street	Green edge lines	Provide green edge lines to existing concrete path to delineate route for commuter cyclist (see photo MPR-4 in Supplementary Report) Liaise with Town of Victoria Park about redirecting commuter cyclist into McCallum Park
SE29	SJMP Path Intersection	Signage	Direct cyclists on SJMP path to SE29 by means of pavement marking
SE29	SJMP Path Intersection	Chevron Line Marking	Install green chevron line marking treatment around bollard on path south of SJMP path intersection
SE29	Coode Street SJMP Path to Mill Point Road	Signage	Install signage on concrete path to the west of Coode Street
SE29	Coode Street / Mill Point Road	Improve Intersection	Through liaison with Main Roads: Reinstate diamond dot marking on southern approach (Coode Street) Install bicycle lanterns to signals Provide guidance on northern brick pavement approach (Coode Street) by painted edge lines

SE29	Coode Street south of Mill Point Road (south bound)	Upgrade Path (15m)	Widen path to kerb for 15m to connect to bicycle lane. Install kerb ramp to provide smooth transition onto the bicycle lane
SE29	Coode Street Wesley College exit	Provide Holding Line	Install holding line to keep exiting vehicles from encroaching onto the bicycle lane
SE29	Coode Street End of bicycle lane to Angelo Street	Remove Car Bay and Install Kerb Ramp	Remove car bay to transition from on road to shared path Replace yellow pavement parking with green (note: potential conflict with student pedestrians – suggest alternative treatment to Coode Street at this location but further investigation required)
SE29	Coode Street / Angelo Street	Improve Intersection	Through liaison with Main Roads: Install diamond dot marking on northern and southern approach (Coode Street) Install kerb ramps to transition cyclists from road to path through intersection (Note: bicycle lanterns proposed in development of route SE28)
SE29	Coode Street South of Angelo Street (south bound)	Mark Bicycle Lane	Edge line missing for a section of the bicycle lane at time of audit
SE29	Coode Street Angelo Street to Hensman Street	Cross Hatching	Liaise with Main Roads to trial yellow cross hatching at the start of car parking bays that do not have standard 0.4m clearance to the bicycle lane
SE29	Coode Street Angelo Street to Hensman Street	Fix Uneven Surface	Through a slow point, the bicycle lane continues and has uneven surface at drainage and service pits. Raise lids or provide asphalt lip to smooth the transition
SE29	Coode Street / South Terrace	Improve Intersection	Through liaison with Main Roads: Install bicycle lanterns Install kerb ramps to transition cyclists from road to path through intersection
Bike Parking	Preston Street Canning Highway	Install 5 U-Rails	Remainder of locations identified

Table 4 – Implementation Plan – Projects 2014/15

Priority 4 Projects (2015/16)

The priority for the fourth year of the program is to address some of the infrastructure deficiencies (Douglas Avenue and Kent Street).

The portion of route SE27 north of Curtin University is to be enhanced. Other spot improvements on the network are prioritised.

Route	Location	Treatment	Details
SE27	Douglas Avenue / Mill Point Road (northern approach)	Green Asphalt Surface	On the north side of Mill Point Road install green asphalt surface and reapply bicycle symbol
SE27	Douglas Avenue / Mill Point Road / Lawler Street	Improve Intersection	Through liaison with Main Roads: Install bicycle lanterns Install green asphalt surface on the pedestrian crossing of Mill Point Rd. This provides priority to cyclists and directs them to Tate St
SE27	Tate Street Mill Point Road to Lawler Street	Resurface bicycle lane	The south bound bicycle lane on Tate Street is to be resurfaced in green asphalt
SE27	Lawler Street Tate Street to Canning Highway	Signage	Improve signage on both ends of Lawler Street
SE27	Douglas Avenue / Canning Highway (southern approach)	Extend bicycle lane (investigation)	Bicycle lane terminates at King Street / Arundel Street to accommodate additional traffic lane Bicycle lane provision required to make this route safe. Further investigation on traffic movement and streetscape design required for this location.
SE27	Hayman Road South Terrace to Kent Street	Upgrade Bicycle Lanes	Ensure all sections meet the standard of 1.8m red asphalt Through turning lanes, install green asphalt on the bicycle lane Kerbing (drainage) to be installed at some sections Trimming bushes and sweeping of debris required (ongoing maintenance requirement)
SE27	Hayman Road Thelma Street approaches	Realign path	Current path deviates from Hayman Road and should be realigned closer to the kerb edge
SE27	Hayman Road / Kent Street	Signage	Ensure clear signage to direct users onto Kent Street path system to avoid the roundabout
SE27	Kent Street Hayman Road to Jackson Road	Maintenance	Ensure bushes are trimmed to 0.5m clearance from path

SJMP Recreational Path	Entire Length	Lighting and Signage	Provide lighting and improve signage to the high profile bicycle route
SJMP Recreational Path	Coode Street intersections	Slowing Devices	Provide treatment to slow vehicles and protect pedestrians and cyclists Consider providing right of way to pedestrians and cyclists
SJMP Recreational Path	South Perth Esplanade / Mends Street	Improve Intersection	Consider removing turnaround area at the bottom of Mends Street to provide bicycle priority on road (Esplanade) to keep commuters off the recreational path
SE24	Canning Highway underpass Banksia Terrace	Signage and Access Improvements	Provide pavement marking and install kerb ramp (refer to page xx, Supplementary Report)
SE30	Murray Street Connection	Upgrade Shared Path	Install 3m red asphalt shared path (replace existing) to the north of the SE33 cycle only path (2012-13), through to Murray Street. Ensure direct connection to Murray Street cul-de-sac is provided.

Table 5 – Implementation Plan – Projects 2015/16

Priority 5 Projects (2016/17)

The priority for the final year of the program is to enhance routes SE28, SE31 and SE35.

Route	Location	Treatment	Details
SE28	Path connection to PSP (overpass near Richardson Park)	Signage	Direct cyclists from the PSP to SE28 route by means of pavement marking Install holding line at the PSP approach
SE28	Overpass connection to Melville Parade	Fillet	Provide fillet to path intersection with Melville Parade
SE28	Richardson Park	Improvement Works	Rebuild path connection from Melville Parade into Richardson Park Modify signage from SE31 to SE28 to signify change of route Improve connections to Perth Zoo (proposed works should be compared to outcomes of traffic and access strategy for South Perth Station Precinct)
SE28	Amherst Street	Green Edge Lines	Install green edge lines on concrete path through zoo car park entrance and exit
SE28	Amherst Street / Labouchere Road	Kerb Ramps and Median Refuge Signage	Provide a crossing of Amherst Street from Labouchere Road. Install two kerb ramps and a median refuge Install directional signage: SE28 (Angelo and Amherst Streets) SE31 (Labouchere Road)
SE28	Angelo Street / Coode Street	Improve Intersection	Liaise with Main Roads to install bicycle lanterns on all movements through this intersection Install directional signage: SE28 (Angelo Street) SE29 (Coode Street)
SE28	Angelo Street / Wesley College entrance and exit	Green Edge Lines	Install green edge lines on concrete path through Wesley College entrance and exit
SE28	Angelo Street Wattle Street to Lawler Street	Squeeze Points	There are squeeze points at 6 locations through this section that should be investigated and treated
SE31	Labouchere Road Thelma Street to South Terrace	Bicycle Symbols	Bicycle symbols have faded in this section and should be reapplied

SE31	Labouchere Road Thelma Street (southern approach northbound	Rectify Bypass	The slow point on Labouchere Road just south of Thelma Street has a bicycle by-pass that is satisfactory for the most part but needs a kerb installed to protect cyclists as vehicles accelerate out of the slow point (and are facing towards the bicycle lane)
SE31	Labouchere Road cul-de-sac Cale Street	Green Chevron Marking	Replace yellow chevron marking with green around the bollards
SE31	Labouchere Road Angelo Street to Cale Street	Red Asphalt Lanes	Consider resurfacing the bicycle lanes to red asphalt on the sections of Labouchere Road that aren't presently.
SE31	Cale Street and Leonora Street	Signage	Extension of Route SE31 requires signage installation on the pavement and otherwise on poles at intersections
SE31	Leonora Street connection from Canning Highway	Path Upgrade	Upgrade path to 2.5m concrete (red asphalt preferred)
SE35	Path connection to PSP (overpass)	Signage	Direct cyclists from the PSP to SE35 route by means of pavement marking
SE35	Melville Parade Overpass to Thelma Street	Signage	Direct cyclists to Melville Parade from the Overpass Direct cyclists to Thelma Street
SE35	Thelma Street Melville Parade to Lockhart Street	Bicycle Lanes	Install bicycle lanes 1.2m wide (red asphalt if resurfacing)
SE35	Thelma Street Labouchere Road to Canning Highway	Resurface Bicycle Lanes	Resurface bicycle lanes to red asphalt and reapply bicycle symbols and directional signage SE35 and SE29 (Thelma Street) SE29 (Coode Street) Ongoing maintenance required to sweep bicycle lanes from debris
SE35	Thelma Street / Canning Highway (western approach)	Extend Bicycle Lane	Bicycle lane terminates for the slip lane and cyclists are forced to use private driveway. Upgrade the section of path from this point to Canning Highway and provide smooth transition
Bike Parking	Angelo Street	Install 4 U-Rails	Install 4 additional U-Rails 2 outside Bocelli Cafe 2 outside Globe Coffee House

SE35	Thelma Street / Canning Highway	Improve Intersection	Through liaison with Main Roads Install bicycle lanterns to the eastern pedestrian crossing of Canning Highway Install directional signage SE35 (Thelma Street) SE29 (Barker Avenue)
SE35	Thelma Street / Canning Highway (eastern approach)	Path Connection and Contra-Flow Lane	New path to be constructed north of existing connection to Thelma Street. Thelma Street is one-way in this vicinity and a contra-flow bicycle lane is proposed for a small section Refer to Supplementary Report for photos and details
SE35	Thelma Street / Throssell Street (western approach)	Improve Intersection	Squeeze point on eastbound bicycle lane at Throssell Street intersection to be addressed. Proposed to retain a kerb and allow bicycle lane to continue and divert onto a path to the crossing (Further investigation could be necessary)
SE35	Thelma Street / Throssell Street	Improve Intersection	Install green asphalt across the intersection for east bound cyclists Install broken edge lines across school entrance for west bound cyclists
SE35	Thelma Street / Throssell Street (eastern approach)	Improve Intersection	Install green asphalt through Penhros College car park for east bound cyclists, clearly marking it as one-way direction (and SE35)
SE35	Thelma Street / Murray Street	Provide New Crossing	Retain existing crossing point and construct new crossing to the south so that west bound cyclists can cross Murray Street directly and continue onto path through to Penhros College and Throssell Street
SE35	Thelma Street Murray Street to Hayman Road	Red Asphalt Lanes	Consider resurfacing the bicycle lanes to red asphalt on any sections of Thelma that aren't presently.

Table 6 – Implementation Plan – Projects 2016/17

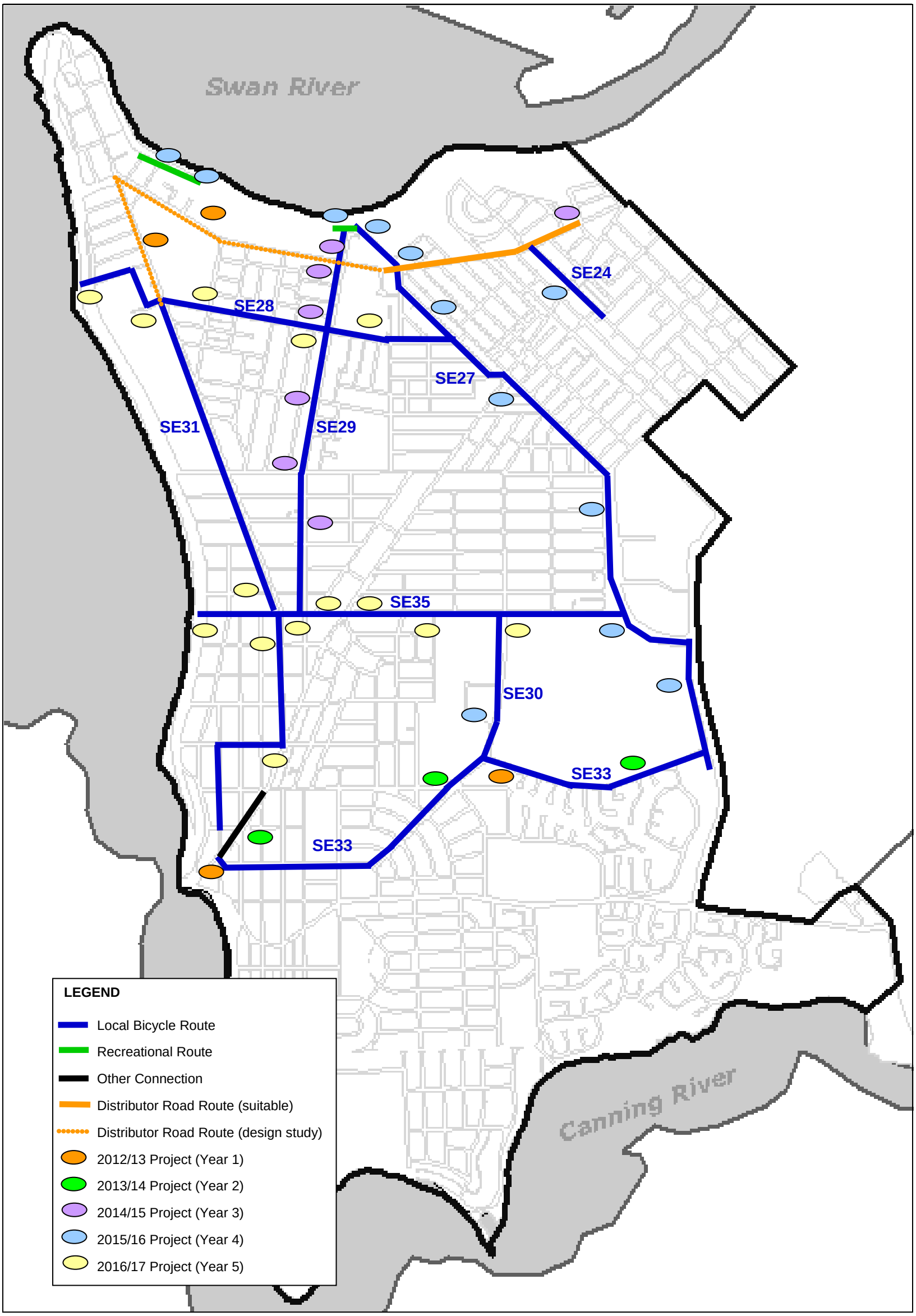


Figure 9 - Implementation Priorities 5-Year

Note: does not include bicycle parking

11.0 Best Practice Treatments

Priority 6 in the National Cycling Strategy 2011-16 relates to *guidance* for authorities and *best practice* treatments. The objective is to:

"Support the development of nationally consistent guidance for stakeholders to use and share best practice across jurisdictions."

In this context, it is not the intention of this plan to develop a set of best practice treatments for the City of South Perth that is separate to the national objectives, but to recommend the City engage in the process of their development with the Australian Bicycle Council, and consider some of the treatments outlined below:

Green Bicycle Lanes

Authorities in Western Australia currently promote red asphalt bicycle lanes as the benchmark for on-road provision for cycling. Green lanes have been trialled but are not widely adopted in this State except at some head-start facilities at traffic controlled intersections.

Nationally, and particularly in Melbourne and Sydney, authorities are adopting "green" lanes at specific locations where there is potential for conflict between bicycle and motor vehicle. It is important that green lane treatments are used sparingly to ensure they do not lose their impact.



It is proposed to only include sections of Green lanes on the areas of high potential of conflict on this route, such as through roundabouts and at major intersections.

Research has shown that coloured lanes reduce the level of accidents between bicycles and motor vehicles. It is the consultant's position that coloured lanes could also have the effect of reducing the speeds of vehicles in adjacent traffic lanes.

Sources of information

- www.austroads.com.au/abc
- Green Bicycle Lanes: Good Practice Review (2010), Australian Bicycle Council

Separated Bicycle Lanes (one-way)

Separated (or buffered) bicycle lanes have not been introduced to the roads in metropolitan Perth, due to the cost and extra space required.

One of the major disadvantages in the application of a conventional bike lane is the ineffectiveness that comes when cars park on the lane. This is a particular concern in the City of South Perth.

Separated bicycle lanes have three purposes:

1. Buffer zone providing additional safety for the person cycling
2. Indicate the prominence of the bicycle route to other road users
3. Keep cars from parking in the lane that forms the bike route



Protective Edge Line

The other form of separation is a physical barrier by means of a kerb or other raised treatment. Safe Roads, an Australian company has proposed treatments for bicycle lanes called the "Safe Cycle Lane Delineator". Refer to information below from its website www.saferoads.com.au




Another form of this treatment referred to as the "Riley Kerb" has been developed by TCA Australia. See information below from its website www.tcaaustralia.com.au


The negative aspect of the protective edge line treatments are the restrictions to cycling single file. Group rides could be impeded and organisations should be consulted before implementation.

The application of the protective edge line treatment could be considered (trialled) at locations where the volume of motor vehicles is high. Labouchere Road and Hayman Road are suggested examples. Consultation with the cycling community is essential,

Dimensions for Bicycle Lanes and Shared Paths

Bicycle lanes of 1.5m (width) and of red asphalt (surface). This can increase to 2m in locations of high traffic speed and traffic volumes.

Shared paths should be 2.5m wide (minimum) on an important route. Routes of greater importance in a regional context should be 3m and in some cases 3.5m. Separation should occur for pedestrians and cyclists if volumes of both users are exceptionally high.

In all cases the dimensions are site specific and treatments should be proposed individually, and include consultation (in the community and State Government agencies such as the Department of Transport and Main Roads).

Connecting On-Road and Off-Road Facilities

This should be a normal practice, but riding the network shows numerous locations that on-road sealed shoulders do not transition smoothly onto the path network, especially at intersection squeeze points. Safe Systems, a program used in Victoria, is currently being piloted by the City to address some of these deficiencies.

Bike Corrals

A recently new innovative treatment is the conversion of car bays to bicycle bays, referred to as Bike Corrals. The City of Moreland has successfully implemented these treatments across certain precincts.

www.moreland.vic.gov.au/environment-and-waste/home_sustainable-transport/walking-cycling.html

Maintenance

An important element to bike network functionality is upholding suitable standards of maintenance. Special consideration is required for the maintenance items indicated below:

- A 0.5m clearance to obstacles from the edge of paths needs to be provided on the shared path network.
- Blind corners caused by overhanging branches have to be resolved through appropriate trimming
- Drainage on shared paths needs to be such that no dangerous surfaces are in existence.

12.0 Recommendations

The following recommendations are not in order or priority but are in the order they were identified in the report.

Recommendation #1: Ensure the planning for South Perth Station Precinct, Canning Bridge Precinct, and other locations of strategic importance, incorporate cycling provision in the transport network plans and eventual modifications.

Recommendation #2: Produce an up to date Integrated Transport Plan, focusing on 'Moving People' to provide policy measures and guide transport planning for the longer term (15-30 years).

Recommendation #3: Communicate with Main Roads WA about forthcoming improvements to the Kwinana Freeway PSP between Narrows and Mt Henry Bridges (as outlined in the WABN Plan).

Recommendation #4: Consider the development of a route to Perth CBD on the east side of the Kwinana Freeway.

Recommendation #5: Implement improvements to the connections to Narrows Bridge from the east and the west.

Recommendation #6: Improve the safety and accessibility for cyclists on South Perth Esplanade through the Mends Street intersection by removing the turnaround area at the bottom of Mends Street.

Recommendation #7: Install lighting and improve signage on Sir James Mitchell Park.

Recommendation #8: Install slowing devices on Coode Street where the recreational shared path intersects. Provide priority to path users over vehicles. Further investigation should be carried out to determine the safety and practicality of these treatments.

Recommendation #9: Undertake traffic study and design of bicycle provisions on Mill Point Road (west of Coode Street) and Labouchere Road (north of Angelo Street) to take into account the impact of the Riverside Drive closure.

Recommendation #10: Manning Road to be considered for shared path upgrades beyond 2017 unless opportunity or demand arises to bring them forward into the 5-year program.

Recommendation #11: The City of South Perth to focus on the improvement of cycling facilities along Distributor Roads (District and Primary) in the longer term (15 - 30 years) and to include provision of adequate cycling facilities as opportunities arise to plan or construct.

Recommendation #12: Implement the Canning Bridge Station to Curtin University Route as a priority in the 2012-17 timeframe.

Recommendation #13: Implement the suggested changes to the local bike network in the short term (5 years).

Recommendation #14: Remove references to “SP” routes identified in previous South Perth plans.

Recommendation #15: Implement the proposed works identified to improve the routes mentioned on page 26 (as per the Infrastructure Implementation Plan).

Recommendation #16: Obtain bicycle count data on specific sites (to be determined).

Recommendation #17: Partner with the Department of Transport and Heart Foundation on education and behavioural change programs.

Recommendation #18: Liaise with the Public Transport Authority and Main Roads regarding Canning Bridge access, and consider in the proposed Integrated Transport Plan and other planning studies relevant to the site.

Recommendation #19: Support measures to slow vehicle traffic speed of Kent Street to improve access points into Curtin – Bentley Specialised Centre.

Recommendation #20: Liaise with the Town of Victoria Park and Curtin University regarding the connections mentioned on pages 29-30.

Recommendation #21: Implement the additional bike parking at the locations mentioned on page 31.

Recommendation #22: Undertake audit of bike parking provision at schools and the path network around the schools and the residential areas.

Recommendation #23: Undertake a review of the City of South Perth Town Planning Scheme No 6 to ensure the bike parking provision recommendations reflect current best practice.

Key recommendations have been summarised for the Executive Summary.

Appendix 1 – Policy Context Specifics

National Policy Context

Cycling as a transport option has gained recognition at a national level in recent years. The Australian Bicycle Council was established in 1999 and is made up of representatives from the Commonwealth Government, each state and territory, as well as the cycling industry and cyclist user groups. It is the national body that manages and coordinates the implementation of the *Gearing Up for Active and Sustainable Communities: Australian National Cycling Strategy 2011 - 2016*.

The South Perth Bike Plan 2012 - 2017 is aligned to the national strategy and specifically addresses three of the six priorities and objectives:

- INFRASTRUCTURE and FACILITIES: Create a comprehensive network of safe and attractive routes to cycle and end-of-trip facilities
- INTEGRATED PLANNING: Consider and address cycling needs in all relevant transport and land use planning activities
- SAFETY: Enable people to cycle safely

The full strategy can be found online at:

www.austroads.com.au/documents/Australian_National_Cycling_Strategy_2011-16(5).pdf

In recent years, the Commonwealth Government has provided funding to local government for cycling infrastructure through the National Bike Paths Projects fund as part of the Economic Stimulus Plan.

South Perth staff should be aware of national funding programs and ensure strategic projects are designed and coordinated in a manner that complies with national criteria set by the Council of Australian Governments (COAG).

The criteria can be found online at:

www.infrastructure.gov.au/infrastructure/mcu/files/OurCities-Discussion_Paper-Appendices.pdf

State Policy Context

At least three State planning documents create the framework for bicycle network planning at a local level:

- Directions 2031
- Moving People Plan (under preparation)
- Western Australian Bicycle Network Plan (draft released March 2012)

Directions 2031, released in 2010, sets a land use planning framework to guide development of metropolitan Perth and Peel. It prioritises Activity Centres outside the Perth CBD as transport destinations to be invested in (page 21 of the Bike Plan refers to the ones that fall in the City of South Perth).

The outcomes of the Bike Plan consider the longer term land use planning objectives of State Government, notably the Curtin – Bentley Specialised Centre.

The State Government, through the Department of Transport, are currently preparing a *Moving People Plan*, which will become the transport strategy for the metropolitan area (replacing the Metropolitan Transport Strategy 1995). The City of South Perth, as are other local governments, is involved in the process of developing road network priorities and identifying route corridors.

In the process, the Moving People Plan utilises the principles of Victoria's SmartRoads, essentially using the road space more efficiently by setting priorities for certain transport modes on certain roads, instead of aiming to include all modes on all roads. At the time of the South Perth Bike Plan 2012-17, the Moving People Plan had been largely undeveloped. The routes prioritised in the City's Bike Plan should help guide the development of the routes at a State Government level.

The Western Australian Government recently released the draft Western Australian Bicycle Network (WABN) Plan, undertaken by the Department of Transport. The plan has clear recommendations supported by the South Perth Bike Plan 2012-17.

- Expansion of the Principal Shared Path Network (Kwinana Freeway PSP from Narrows Bridge to Mt Henry Bridge (WABN pages 4, 24)
- Perth Bicycle Network Grants (WABN pages 5, 32)
- Connecting Schools (WABN page 6)
- Connecting Rail / Major Bus Stations (WABN page 6)
- Review of Local Bicycle Routes (WABN page 7)

The Review of Local Bicycle Routes needs to consider the bicycle network outlined in this report. The City of South Perth should liaise with Department of Transport regarding the above.

Local Policy Context

The City of South Bike Plan 2012-17 is aligned to the *Our Vision Ahead* document.

The document provides the vision statement:

"We belong to an engaged and cohesive community that is linked by vibrant local centres and shared spaces. We live and travel in ways that nurture our environment, and our housing and amenities meet the diverse needs of a changing society."

Cycling is a transport option to nurture the local environment and amenity.

Under the key theme of *Transport*, the document outlines a key priority area being to *Improve Movement by Bike or Foot*. Measures to achieve this are:

- Create an attractive and safe environment for movement by bike and foot.
- Investigate appropriate areas for separate bike and foot paths.
- Look into developing and promoting educational strategies to increase safety on shared-use paths.
- Increase the number and safety of cycle lanes on roads.

The City's *Strategic Plan 2010-15* guides the activities of the Council for a five-year period. The City's Strategic Plan outlines how it aims to achieve its vision and mission.

Strategic Direction: *Transport* - Improve accessibility to a diverse and interconnected mix of transport choices:

5.1 Improve access and use of railway station precincts and surrounding land uses.

5.2 Ensure transport and infrastructure plans integrate with the land use strategies and provide a safe and effective local transport network.

The Integrated Transport Plan prepared 2006 by the City of South Perth proposes a framework for the City to address economic, social and environmental challenges relating to the transport network.

9 of the issues raised in the Integrated Transport Plan pertain to cycling (ITP pages 46-47).

Issue D7 is a priority of the South Perth Bike Plan 2012-17:

- *Poor cycling access along major arterials and inter suburban links reduces the ability for cyclists to ride the road network safely and this may reduce the appetite to use cycles as an alternative form of transport.*
- *Lack of integration of bike facilities across Local Government boundaries may discourage cycling as an alternative transport mode.*

D-7 Proposed Response: *Review bike plan for coverage of issues.*

Issue D9 in particular is a priority of the South Perth Bike Plan 2012-17:

- *The lack of a dedicated cycle route to Curtin University particularly between Sir James Mitchell Park cycle ways and Curtin University may reduce the desirability of the cycle as a preferred transport mode.*
- *Poorly defined east – west link through the centre of the City of South Perth may reduce the desirability of the cycle as a preferred transport mode.*

D-9 Proposed Response: *Ensure that the cycle infrastructure across the City is appropriate to the current and future usage levels.*

Other Relevant Policies

The *Curtin-Bentley Specialised Activity Centre Plan* provides an important framework for cycling relevant to the City of South Perth's planning objectives. The Curtin Plan specifically states on page 46:

- *The accommodation of cycling as a mode of transport to the area and within the campus is considered essential as an integrated approach to transport planning of the area. The cycle infrastructure is enhanced not only through the provision of additional paths but also by creating an environment that encourages their use.*

The *Heart Foundation*'s objectives to increase physical activity throughout Australia and defined in 2 key documents:

- *Blueprint for an Active Australia 2010-13*
- *An Australian Vision for Active Transport*

The Blueprint for an Active Australia outlines the following key action:

- *Actively encourage, support and facilitate more walking, cycling and public transport use.*

An Australian Vision for Active Transport declares the following vision:

- *Promote the cultural and environmental change required to create a safe environment for people who choose to walk, cycle or take public transport and review jurisdictional approaches to the legislative protection of vulnerable road users to identify and promote best practice.*

It then defines how it will be achieved:

- *Adopt a nationally consistent approach to lowering speed limits in areas of high pedestrian and cycling use.*
- *Consider wider health and sustainability issues in road rule changes and road safety strategies.*
- *Implement a national road safety campaign on multiple benefits of speed limit changes.*

The above documents indicate the national, state and local policies that set the framework for the City of South Perth to improve its bicycle network through the South Perth Bike Plan 2012-17.

Appendix 2 – Road Network Inventory

On Road Bicycle Lane Inventory

ROAD	SECTION	PBN	Non-PBN
Labouchere Road	Angelo Street to Greenock Avenue	2.4km	
Coode Street	Mill Point Road to South Terrace		1.3km
Mill Point Road	Coode Street to Way Road		1.4km
Douglas Avenue	Arundel Street to South Terrace	0.65km	
South Terrace	Canning Highway to Douglas Avenue	0.8km	
George Street	Douglas Avenue to Kennard Street	0.4km	0.45km
George Street	Lansdowne Road to Vic Park boundary		0.17km
Hayman Road	South Terrace to Kent Street	1.3km	
Dick Perry Avenue	Burvill Court to Kent Street		0.6m
Thelma Street	Lockhart Street to Canning Highway	0.45m	
Thelma Street	Morrison Street to Throssell Street	0.09km	
Thelma Street	Murray Street to Hayman Road	0.65km	
Barker / Talbot Avenue	Canning Highway to Henley Street	1.1km	
Cale Street	Melville Parade to Robert Street	0.3km	
Cale Street	Canning Highway to Park Street	0.1km	
Henley Street	Edgecumbe Street to Ley Street		0.35km
Clydesdale Street	Henley Street to McDougall Street		0.2km
Davilak Street	Lockhart Street to Ley Street		0.4km

Ley Street	Davilak Street to Philip Avenue		0.12km
Ley Street	Manning Road to Downey Drive		0.07km
Cloister Avenue	Ley Road to Duckett Drive	0.17km	
Welwyn Avenue	Manning Road to Griffin Crescent	0.5km	
Welwyn Avenue	North of Cloister Avenue to Hope Avenue	0.25km	
Unwin Crescent	Welwyn Avenue to Sulman Avenue	0.22km	
Kent Street	Jarrah Road to Manning Road	2.1km	
Walanna Drive	Gillon Street to Jackson Road		1.2km
	TOTALS	11.5km	6.2km
		17.7km	

PBN - On Road Route (non-Bicycle Lane) Inventory

ROAD	SECTION	PBN
Angelo Street	Labouchere Road to Rose Avenue	0.8km
Angelo Street	Waverley Street to Lawler Street	0.65km
Melville Parade	Hardy Street to Richardson Street	0.2km
Douglas Avenue	Coode Street boat ramp to Mill Point Road	0.3km
Tate Street	Lawler Street to Mill Point Road	0.08km
Lawler Street	Tate Street to Elizabeth Street	0.8km
Elizabeth Street	Lawler Street to Canning Highway	0.07km
Comer Street	Melville Parade to McDonald Street	1.1km
McDonald Street	Thelma Street to South Terrace	1km
South Terrace	McDonald Street to Canning Highway	0.15km
Thelma Street	Canning Highway to Morrison Street	0.55km
Murray Street	Thelma Street to McNabb Street	0.65km
Labouchere Road	Greenock Avenue to Cale Street	0.4km
Cale Street	Robert Street to Canning Highway	0.25km
Cale Street	Park Street to Bruce Street	0.65km
Bruce Street	Cale Street to Henley Street	0.3km
Talbot Avenue	Henley Street to Bickley Crescent	0.2km
Bickley Crescent	Talbot Avenue to Manning Road	0.5km
Godwin Avenue	Bickley Crescent to Henley Street	0.4km

Cloisters Overpass	River boat ramp to Canning Parade	0.25km
Gentilli Way	Canning Parade to Mt Henry Road	0.4km
Duckett Drive	Cloister Avenue to Griffin Crescent	0.13km
Griffin Close	Duckett Drive to Elderfield Road	1km
Welwyn Avenue	Hope Avenue to Unwin Crescent	0.65km
Sulman Avenue	Unwin Crescent to cul-de-sac	0.1km
Dungarvan Court	Entire road length	0.15km
Synge Place	Entire road length	0.06km
Carlow Circle	Synge Place to Cashel Way	0.22km
Cashel Way	Carlow Circle to Waterford Avenue	0.3km
Waterford Avenue	Manning Road to Nenagh Grove	0.65km
Nenagh Grove	Entire road length	0.12km
Hurlingham Road	Mill Point Road to foreshore car park	0.7km
Banksia Terrace	Bright Street to George Street	0.35km
Market Street	Douglas Avenue to Dyson Street	0.45km
View Terrace	Dyson Street to Banksia Terrace	0.2km
Fourth Avenue	Banksia Terrace to Gwenyfred Road	0.45km
Gwenyfred Road	Second Avenue to Fourth Avenue	0.2km
Second Avenue	Gwenyfred Road to Vic Park boundary	0.1km
	TOTALS	**15.5km**

PBN – Compromised On Road Route Inventory

ROAD	SECTION	PBN
Angelo Street	Rose Avenue to Waverley Street	0.35km
Thelma Street	Throssell Street to car park cul-de-sac	0.07km
Cloister Avenue	Mt Henry Road to Ley Street	0.15km
Welwyn Avenue	Griffin Crescent to Cloister Avenue	0.13km
Banksia Terrace	Mill Point Road to Canning Highway	0.3km
Banksia Terrace	View Terrace to Bright Street	0.2km
George Street	Kennard Street to Lansdowne Street	0.1km
	TOTALS	1.3km

Appendix 3 – Path Network Inventory

Path Connection (adequate) on PBN Route

ROAD / RESERVE	SECTION	PBN
Richardson Street (south)	Melville Parade to Perth Zoo carpark	0.3km
Thelma Street (north)	Penrhos College connection	0.22km
Henley Street (north)	Bruce Street to Goss Avenue	0.25km
Kent Street (west)	Manning Road to start of bike lane	0.3km
Banksia Terrace (east)	Canning Highway to View Terrace (bi-directional lane)	0.4km
	TOTAL	1.5km

Path Connection (compromised) on PBN Route

ROAD / RESERVE	SECTION	PBN
Richardson Park (east)	Richardson Street to Amherst Street	0.25km
Jackson Road	Entire road length	1.3km
Path Connection	Henley Street to Murray Street	0.5km
Path Connection	Connection to Murray Street	0.1km
Path Connection	Elderfield Street to Dungarvan Court	0.1km
Path Connection	Dungarvan Court to Synge Place	0.25km
	TOTAL	2.5km