Joint Bike Plan

City of South Perth and Town of Victoria Park

August 2018

City of South Perth

Town of Victoria Park

aurecon

Bringing ideas to life

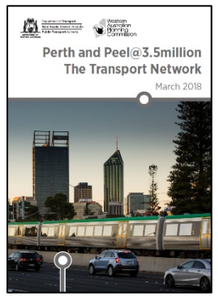
Executive Summary

1. Introduction

Aurecon was commissioned to develop the joint Bike Plan for the City of South Perth (CoSP) and Town of Victoria Park (ToVP). The joint Bike Plan has been part funded through the WA Bicycle Network Grants Program, which is administered by the Department of Transport (DoT).

This is the first time two local governments have worked together to deliver a bike plan in Western Australia, providing an excellent opportunity to provide a consistent outcome and benefits for the local cycling community.

The joint Bike Plan sets out the long term vision for the strategic cycling network over the CoSP and ToVP area, in line with State Government's Perth and Peel Transport Plan for 3.5 million People and Beyond ('Perth Transport Plan for 3.5 million'). The joint Bike Plan also outlines five-year action plans for specific improvements to the cycle network and environment for each local government to further investigate and implement.



2. Structure of this Plan

The joint Bike Plan (the 'Plan') is divided into the following key sections:

Executive Summary

The executive summary outlines the key findings of the consultation; surveys, research and investigation for the Plan. In addition, it displays the vision for the overarching long term strategic bicycle network over both local government areas.

Introduction, Policy and Strategic Context

This section outlines the key objectives and background information of the Plan and provides context regarding the relevant policies and strategies that have influenced the development of the Plan.

City of South Perth

This section of the report focuses on the CoSP local government area. It details the findings from the consultation, surveys, research and investigation of the existing cycle network within the CoSP. In addition, it outlines the proposed five-year action plan, including a prioritised list of projects for the CoSP to further investigate and implement.

Town of Victoria Park

This section of the report focuses on the ToVP local government area. It details the findings from the consultation, surveys, research and investigation of the existing cycle network within the ToVP. In addition, it outlines the proposed five-year action plan, including a prioritised list of projects for the ToVP to further investigate and implement.

3. Stakeholder Consultation

As part of the development of the Plan, extensive consultation was undertaken with the local community and cycling groups and other key agencies. The marketing and promotion of the community engagement activities were carried out jointly by the CoSP and ToVP.

The local community were invited to provide feedback on their cycling journey via an online questionnaire, online mapping tools and community workshops. This provided the opportunity to identify common routes, existing issues, barriers to cycling, and desired locations to improve or provide additional facilities and infrastructure.

Throughout the development of the Plan, several agencies were consulted, including state government agencies, adjacent local government authorities, Curtin University and local cycling groups. Local government officers within the CoSP and ToVP were also consulted to ensure the Plan aligns with local strategies and future projects.

4. Research and Investigation

In a rapidly changing transport environment and with predicted increase in advanced technologies, such as autonomous vehicles, how will cycling fit into everyday travel behaviour in the next 30 years? The future of cycling is explored in this Plan with consideration into how future infrastructure can be integrated with future technologies.

To understand the existing cycling conditions within the CoSP and ToVP, significant investigation into the following was undertaken:

- Detailed literature review, including previous cycle planning documents;
- Interrogation of key demographic statistics of both CoSP and ToVP to understand the potential for increased cycling;
- Analysis of existing recorded crash data involving cyclists to understand trouble spots and wider trends;
- Assessment of the overall transport network to determine gaps in the existing cycle network and appropriate cycling connections to key existing and future trip generators; and
- Infrastructure audits, including saddle surveys, to assess the condition of existing and potential future cycle routes.

5. Strategic Cycle Network

The first key component of the Plan is the establishment of the long term aspirational cycle network, i.e. what the cycle network within the CoSP and ToVP endeavours to look like by the time Perth's population grows to 3.5 million (towards the year 2050).

The proposed aspirational cycle network outlines several ambitious routes aimed at making cycling a realistic and appealing option for a high proportion of the population. The aspirational cycle network has been influenced by the routes identified in the Perth Transport Plan for 3.5 million and the research, investigation and consultation undertaken as part of the project.

The proposed network is based on a cycling route hierarchy, developed by the DoT, which aims to provide consistency in cycle planning across the State. The function of each cycling route is briefly described below:

- **Primary Routes (red)** – These routes provide safe, prioritised and uninterrupted facilities which form the spine of a cycle network. They are conducive to medium and long distance commuting, recreational and tourism trips;

- **Secondary Routes (blue)** – These routes provide safe and direct connections, typically between primary routes and major trip generators such as shopping centres, industrial areas or major health, education, sporting and civic facilities; and

- **Local Routes (green)** – These routes provide safe cycling conditions in local (predominantly residential) areas. The purpose of local routes is to collect cycling traffic from local roads within towns and suburbs and distribute it to the primary and secondary networks.

The proposed aspirational network over both the CoSP and ToVP areas is shown at the end of the executive summary (refer to Figure A).

6. 5-Year Implementation Plan

The second key component of the Plan is the establishment of a 5-year action plan for both the CoSP and ToVP that identifies key cycle infrastructure projects to be further investigated and delivered by each council. A total of 13 key infrastructure projects are proposed for delivery over both council areas, as described in Figures B-1, B-2 and B-3.

High level order of cost estimates have been determined for these projects, however further investigation will need to be undertaken to develop detailed concepts and understand the true cost of each project. Funding assistance from other agencies, such as the DoT, will need to be explored by both CoSP and ToVP during implementation of the Plan.

In addition to the key cycling infrastructure projects identified, there are several minor works improvements that were identified throughout the infrastructure audits and investigation. These are generally considered low cost 'quick wins' and intended to be incorporated into each council's capital works programs where possible. Proposed improvements include items such as new or improved cycle bypass paths through roundabouts and intersections, improved pavement markings and signage and other infrastructure modifications that aim to further enhance the existing cycle routes, with particular regard to safety and convenience. An additional common issue is the consistency of application of bicycle detection loops at signalised intersections. The CoSP and ToVP should audit all intersections within their jurisdiction to identify all intersections that do not have bicycle detection loops and liaise with Main Roads to implement them.

It is intended that this Plan is revisited every 5 years to assess the outcomes of the previous 5-year implementation program in continuing the journey of achieving the long term aspirational network.

7. Supplementary Initiatives

Whilst investment in cycling infrastructure is vital in providing safe, connected options for cyclists, there are a range of additional measures that are just as critical in promoting mode shift towards cycling.

Several initiatives are proposed for each council area, and are summarised in Figure C at the end of the executive summary. Many of the proposed initiatives should be delivered simultaneously with the implementation of the proposed infrastructure projects as they are complementary and have the potential to increase the potential for behaviour change towards increased cycling.

8. Plans under Development

Clontarf-Waterford-Salter Point Foreshore Area (CoSP)

The CoSP is developing a masterplan for the section of foreshore from Clontarf through to Waterford and Salter Point. The Masterplan will provide a consolidated management strategy recognising the ecological, cultural and recreational values of the area. The Plan identifies the entire foreshore path as a long term cycle route within the CoSP, including a potential future cycling connection to the principal route along the Kwinana Freeway. It is proposed that cycle infrastructure is investigated to be provided along the full length of the foreshore to provide consistency and legibility and to capitalise on the beautiful scenery that is offered and encourage increased cycling in the community. The Plan aims to acknowledge a future cycling connection to the Mt Henry Bridge as a long term aspiration and one that will require significant further investigation and community consultation. An alternative route connecting to the Kwinana Freeway will need to be considered as part of this investigation.

Taylor Reserve and McCallum Park (ToVP)

Taylor Reserve and McCallum Park is proposed to be redeveloped in line with the Town of Victoria Park's 2015 Foreshore Access and Management Plan. The draft Concept Report (2017) details a variety of new high-quality spaces throughout the park with the intention to create a destination for the region, whilst maintaining the core function as an event space. Four precincts are proposed including a Parkland and Event Space, Beach and Activity Node, River Edge and Revegetation and Parking.

The existing separated cycle path along the foreshore is proposed to be realigned to the rear of the site and connected to the existing cycle paths on both sides of the park. This will provide cyclists with a direct route with minimal interruptions caused from other users of the park. The development of the concept is currently in progress.

As part of the redevelopment, an area is proposed for a BMX trail as part of the 'All Ages Play' Activity Hub (Taylor Reserve & McCallum Park Concept Report, November 2017). It is recommended that the feasibility of a hybrid style pump/BMX track similar to that at Shepherds Bush Park in Kingsley, but at a smaller scale, be constructed at this location. A Bike Skills Track, which has a considerably smaller footprint to the pump track, could also be considered at the Activity Hub if there is space. The facility should consider CPTED (Crime prevention through environmental design) principles.

9. Areas outside of Council Control

During the development of the Plan, several issues were identified regarding the safety, connectivity and convenience for cyclists, both in areas within council boundaries that are outside of local government control and adjoining routes to the study area. It is proposed that both the CoSP and ToVP lobby the following improvements to the respective agencies responsible for the below infrastructure:

- Canning Bridge & Kwinana Freeway principal shared path (PSP) (south of Canning Bridge)
  - Replace the existing degraded path with high quality red asphalt path with lighting. Investigate the feasibility of separation or path widening;
  - Investigate treatment to sections of the PSP under Canning Bridge where flooding occurs during high river tides and wet weather;
  - Investigate improving priority for cyclists connecting to Canning Station. The above should be considered in any future works planned in this area by the Transport Portfolio and as part of the Canning Bridge Activity Centre Plan; and
  - Monitor the usage of the bicycle storage facilities (through consultation with the Public Transport Authority (PTA). Any future works should consider modifications and potential upgrades to storage facilities.
- Canning Highway crossing at Cale Street
  - Cale Street provides an important east-west connection through the CoSP and provides a convenient connection to the Labouchere Road cycling route. The existing crossing of Canning Highway is an issue as it is not wide enough to accommodate cyclists. Investigate providing an appropriate crossing across the Canning Highway intersection to facilitate cyclists, in liaison with Main Roads.
- The Causeway shared path
  - The Causeway is a critical connection between the ToVP and the Perth CBD, with significant conflicts experienced between pedestrians and cyclists. A pedestrian/cycle bridge across Heirisson Island is highlighted in the Perth Transport Plan at 3.5 million, and the acceleration of the implementation of this project is recommended.
- Burswood Park (controlled by the Burswood Park Board)
  - The existing shared path along the Swan River caters for high demand for a mix of users, creating the potential for conflict. Investigation into the feasibility of separation or path widening should be undertaken, as well as improved path lighting.
- Orrong Road
  - Orrong Road is under the control of Main Roads, with long term plans for the road unclear. The ToVP should continue to liaise with Main Roads and the City of Belmont to ensure that any future plans consider cyclists

10. Summary Figures

The following figures within the Executive Summary summarise the key findings of the Plan for both the CoSP and ToVP:

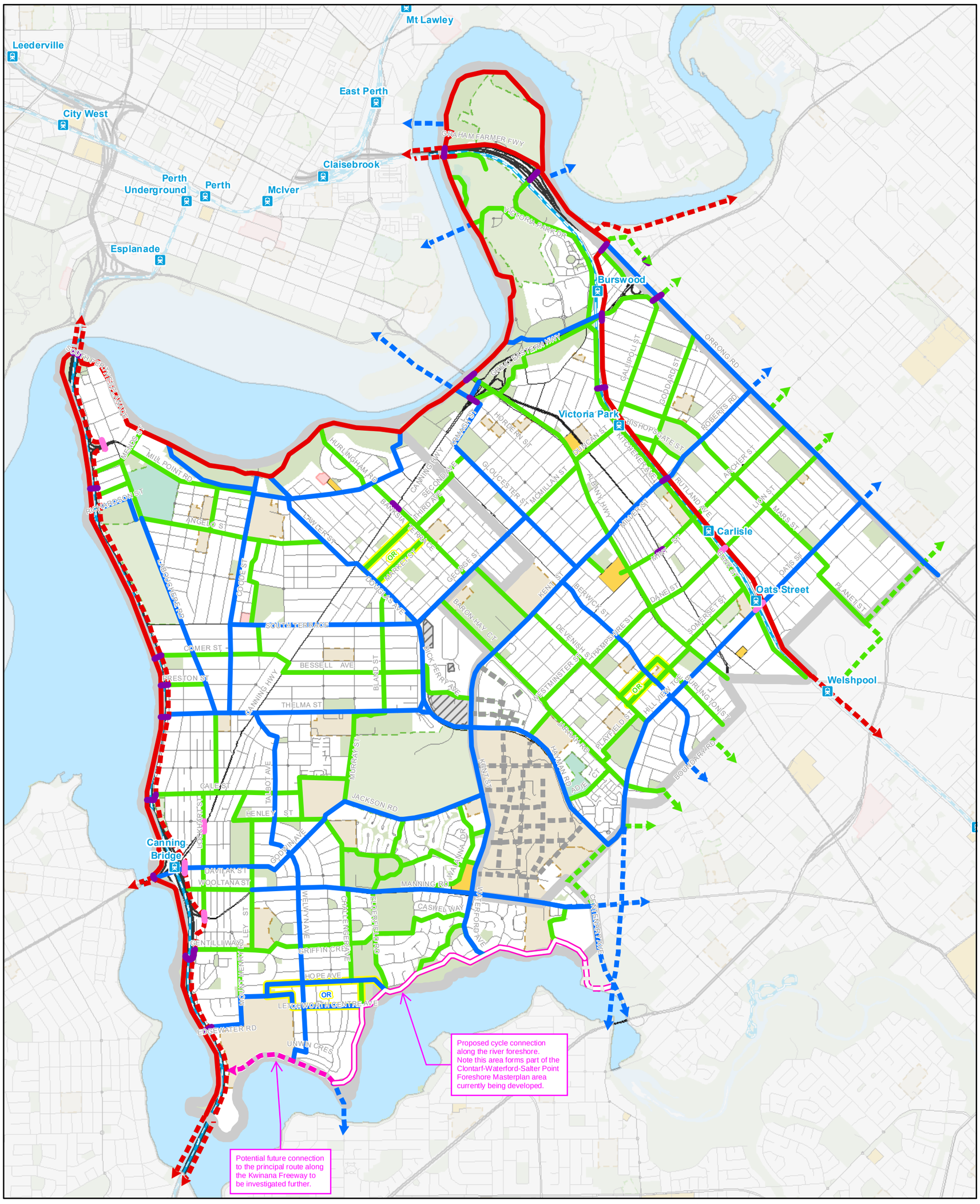
Figure A: The proposed aspirational network over both the CoSP and ToVP areas

Figure B-1: A figure showing the proposed 5-year implementation plan for both the CoSP and ToVP

Figure B-2: A summary description of the proposed 5-year action plan for the CoSP

Figure B-3: A summary description of the proposed 5-year action plan for the ToVP

Figure C: A summary of the proposed supplementary initiatives for both the CoSP and ToVP



Legend

- Rail Stop
- Railway
- Freeway
- Highway
- Main
- Minor

Aspirational Network
- Principal Route
- Principal Route - by others
- Strategic Routes
- Strategic Routes - by other
- Local Routes
- Local Routes - by others
- Within Curtin University

Overpass/Underpass
- Existing Overpass/Underpass
- Proposed Overpass/Underpass

- LGA Boundary (Town of Victoria Park/City of South Perth)
- Shopping Area
- Community Facility
- Hospital Facility
- Education Facility
- Recreational Facility
- Recreational Park or Reserve
- Reserve (Miscellaneous & Other)

0 1 2 km

Figure A
Aspirational Cycle Network

Revision: 1	Project No: 255909	Date: May 2018
Prepared: S.Richards	Checked: M.LaGalia	Approved: M.LaGalia
Coordinate System: GDA 1994 MGA Zone 50		Scale @ A3: 1:34,000

Source: © Landgate 2017, OpenStreetMap

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Client: Town of Victoria Park, City of South Perth

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Legend

- Rail Stop
- Railway
- Freeway
- Highway
- Main
- Minor

Prioritised Proposed Projects

- Separated Path (Bikes Only)
- High Quality Shared Path (Bikes and Pedestrians)
- Bicycle Lanes or Sealed Shoulders
- Safe Active Street
- LGA Boundary (Town of Victoria Park/City of South Perth)

- 1 CoSP Prioritised Project
- 1 ToVP Prioritised Project
- Prioritised Project 1
- Prioritised Project 2
- Prioritised Project 3
- Prioritised Project 4
- Prioritised Project 5
- Prioritised Project 6
- Prioritised Project 7

- Shopping Area
- Community Facility
- Hospital Facility
- Education Facility
- Recreational Facility
- Recreational Park or Reserve
- Reserve (Miscellaneous & Other)

0 1 2 km

Figure B
5-Year Implementation Plan

Revision: 1	Project No: 255909	Date: May 2018
Prepared: S.Richards	Checked: M.LaGalia	Approved: M.LaGalia
Coordinate System: GDA 1994 MGA Zone 50		Scale @ A3: 1:34,000

Source: © Landgate 2017, OpenStreetMap

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Client: Town of Victoria Park, City of South Perth

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Figure B-2
5-Year Action Plan (CoSP)

City of South Perth

1 South Perth Esplanade Project

2 Canning Bridge to Curtin Link

3 Manning Road Project

4 Douglas Avenue Project

5 Thelma Street Investigation

6 Kent Street Project

7 Coode Street Project

Figure B-3
5-Year Action Plan (ToVP)

TOWN OF VICTORIA PARK

1 Rutland Avenue Project

New cycle facilities between Welshpool Road and Riversdale Road.

2 Kent Street Project

Upgraded shared path facilities between Curtin University and Orrong Road along Kent Street, Miller Street and Roberts Road.

3 Albany Highway Investigation

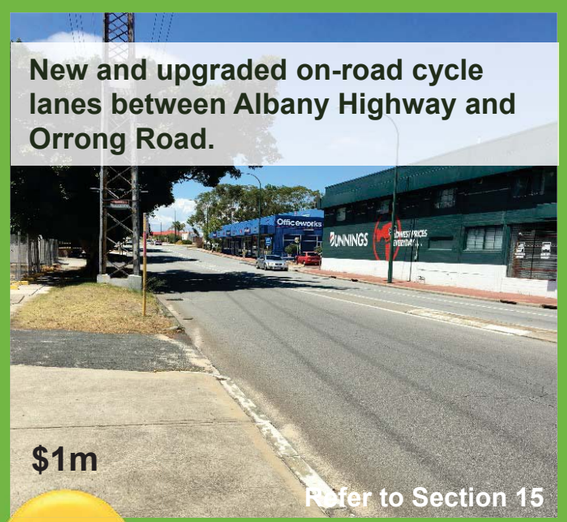
Investigation into the long term treatment of Albany Highway to incorporate and enhance access for cyclists, plus interim measures to improve cyclist safety and awareness.

4 Gloucester Street Project

New safe active street between The Park Centre and McCallum Park.

5 Oats Street Project

New and upgraded on-road cycle lanes between Albany Highway and Orrong Road.



6 Hayman Road Project

Upgraded shared path facilities between Adie Court and Holder Street.

Figure C

Supplementary Initiatives

Infrastructure

Trial Projects

Behaviour Change

Supplementary Bike Initiatives

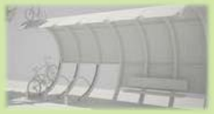
Recreational Facilities

Bike Parking and Amenities

Bike parking and amenities help complement the cycle network by reducing inconveniences associated with cycling.

- Amenities include bicycle pump stations, repair stations, water fountains and e-bike charging stations.
- Types of bike parking recommended include secure and sheltered, sheltered and unsheltered facilities.

CoSP	ToVP
Complete an audit/gap analysis of existing end of trip facilities	
Locations to install additional public bike parking and amenities should include:	
• Mends Street and Jetty • Manning Hub • George Burnett Park • South Perth foreshore at Coode Street • Angelo Street shops • Preston Street shops • Como IGA • Canning Bridge • South Perth Operations Centre • Clontarf Campus • Richardson Park • Moresby Street Shops	• Albany Highway • Swansea Street markets • Archer Street shop • Bentley Technology Park • Burswood Park • John McMillan Park • Major bus stations



Wayfinding

Informs users of their surroundings in the built environment and guides them to key destinations.

CoSP	ToVP
Undertake a joint cycling wayfinding strategy to provide a consistent approach over the council areas. The strategy should consider DoT guidance.	
Key destinations for wayfinding include:	
• Rail stations • Curtin University • Perth Zoo • Mends Street Precinct • Preston Street Precinct	• Manning Hub • Albany Highway Commercial Precinct • Perth Stadium • Crown Perth
Locations to intersecting cycle routes, road names, and bike parking facilities should also be incorporated.	

Cycle Monitoring

Helps to understand cycling patterns over time and inform cycle-related projects into the future. Pedestrian volumes should also be monitored as part of this on shared paths.

CoSP	ToVP
Potential locations for permanent cycle counters include:	
• Hayman Road • Lawler Street	• Rutland Avenue • Kent Street • Taylor McCallum Park • Burswood Park

Innovative Solutions to Improve Cycling Priority

Exploring opportunities for creative solutions to increase cycling priority should be encouraged, particularly within challenging areas.

CoSP	ToVP
Mends Street Precinct and Foreshore • As part of the Connect South Project, support the introduction of a 'shared space' along the high activity area of Mends Street. The shared space concept involves reducing the posted speed limit to 30km/h and integrating all road users to provide pedestrians and cyclists with movement priority.	Kent Street/Albany Highway/Miller Street Intersection • Investigate modifications to improve safe access for cyclists and reduce vehicle speeds. This will require consultation with the PTA in order to consider bus movements. Hayman Road/Curtin University Main Street Intersection • Investigate reconfiguration of the signal phasing to allow the pedestrian/cyclist signal phase to remain green until left and right turning vehicles trigger the loop detectors. This will require consultation with Main Roads.

Awareness Campaigns

Help encourage consideration amongst all users of the transport network . Examples of potential campaigns that could be considered by each council include:

- Positive encouragement pavement markings and signage. An example is the 'Take Care' pavement markings along shared paths within the City of Perth.
- Advertisement methods such as area-wide publicity campaigns. An example is the 'Share our Roads' campaign from the Road Safety Commission (RSC).

E-Bike Salary Sacrifice

E-bike salary sacrificing has recently been ruled in favour of by the ATO and as a result, there are leasing and financing companies that provide e-bike packages.

E-bikes are gaining in popularity and could help encourage people to cycle because they do not require as much physical energy to operate compared to traditional bikes and e-bikes allow a longer distance of travel for the equivalent amount of energy expenditure.

CoSP	ToVP
Offer an e-bike salary sacrifice service to City staff and promote to other organisations to offer the same service.	

Curtin University Bike Share Scheme

With the implementation of the Bike Plan recommendations, connectivity between Curtin University and Public Transport infrastructure will be enhanced. As such, there is an opportunity to establish a trial bike share scheme to complement the infrastructure projects.

CoSP	ToVP
Work with Curtin University to investigate establishing a bike share scheme	
• Potential docking stations in the vicinity of Canning Bridge Station, complementing the Davilak Street/Jackson Road bicycle link.	• Potential docking stations at Victoria Park Station, Albany Highway and/or Carlisle Station, complementing the Kent Street/Miller Street bicycle link.

Your Move

The Department of Transport's Your Move program supports communities, local governments, schools and workplaces to promote active transport and reduce congestion.

CoSP	ToVP
Each council should actively participate in the Your Move program, by utilising the tools available to promote active transport for council staff. Each council should also encourage other organisations within the community to participate.	
Investigate the establishment of an intensive project partnership with DoT, similar to the successfully run 'Your Move Central' program, by targeting local schools.	Investigate extending the intensive project partnership 'Your Move Central' to target schools and organisations that have yet to participate.

Cycle Volume and Speed Device

In addition to the installation of new permanent cycle counters, investigation should be undertaken into trial devices that indicate the following:

- Real-time number of cyclists and pedestrians using the path that day and year raising awareness and acknowledging the positive impacts. Potential locations could include the shared paths on the approach to the Narrows Bridge and Causeway.
- Real-time speed (similar to roadwork sites) and to 'slow down' if required. This can help promote behaviour change, encouraging cyclists to reduce speed in areas of high pedestrian and cyclist demand. Potential locations could include the shared paths at west of Mends Street and Burswood Park.

Kids Skills Track

Encourages youth to cycle and develop their skills in a safe environment.

It is proposed the existing cycle track at George Burnett Park is upgraded to include a revitalised skills track, consisting of asphalt path circuits with pavement markings and signage simulating an urban traffic environment.

The track should be supported by improved nearby cycle infrastructure connections.

Pump Track

Encourages people of all ages to cycle for recreational use.

It is proposed that a pump track is installed within George Burnett Park to complement the kids skills track. The track could consist of circular loops with smooth dirt mounds and berms that cyclists can ride around in a pumping motion.

Events

Events encourage new cyclists to 'give it a try' and also consolidate travel behaviours for existing cyclists. It is recommended that both Councils:

- Continue to promote and participate in annual public events including Bike Week, Ride2Work Day and Ride2School Day.

Table of Contents

Appendices

1 Introduction

1.1 Objective

The joint Bike Plan for the City of South Perth (CoSP) and Town of Victoria Park (ToVP) sets out an action plan for immediate improvements to the cycle network and environment, and a long term aspirational vision for the continued development and promotion of cycling within the CoSP and ToVP.

The joint Bike Plan has been part funded through the WA Bicycle Network Grants Program, which is administered by the Department of Transport (DoT), and is in line with State Government's Perth Transport Plan for 3.5 million.

Sections 3 to 9 focus on the CoSP local government area, while Sections 10 to 17 focus on the ToVP local government area. The following are the key objectives of the Plan:

- Evaluating cycling and associated infrastructure in the study area, considering cycling safety and the needs of all categories of cyclists regardless of their age, gender, experience or reason for cycling;
- Consulting with key stakeholders, including local and state government, and the local community regarding the future of cycling within the CoSP;
- Planning the expansion of the bicycle network to link key attractors and destinations including schools, public transport nodes and community priorities;
- Encouraging and promoting cycling; and
- Developing a five-year action plan with a prioritised schedule of works.

The desired outcome of this Plan is simple – to increase the number of people cycling. Specifically, the Plan aims to double the number of people cycling in the CoSP and ToVP over the next five years.

Increasing the number of trips undertaken by bike has proven economic, social and transport benefits. Particular emphasis on maximising shorter trips made by bikes is a key aspect to consider. A 5km to 10km ride to work will only take 15 to 30 minutes to complete on average, while peak-hour city trips up to 10km are generally faster by bike than any other form of transport, door to door.

Double the number of people cycling over the next five years

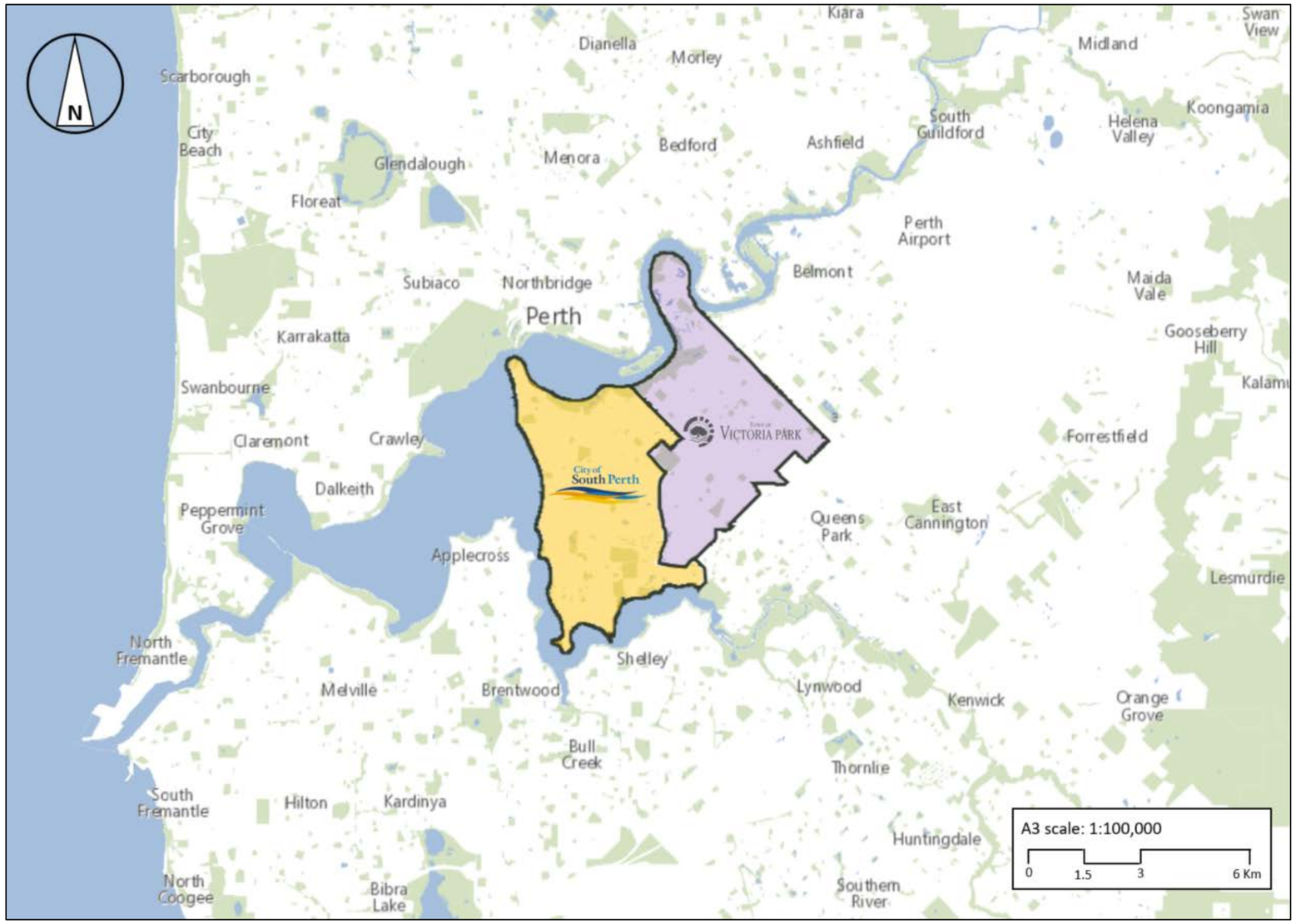


Figure 1-1: Locality map

1.2 Bicycle Users

There is a well-known planning concept of 880 cities, that if everything we do in our public spaces is great for an 8 year old and an 80 year old then it will be great for all people. The Plan aims to consider the 880 concept to allow for a safe and practical cycle network for all users.

*"**Step 1:** Think of a child that you love and care for who is approximately **8 years of age**. This could be a child, grandchild, sister, brother, cousin etc.*

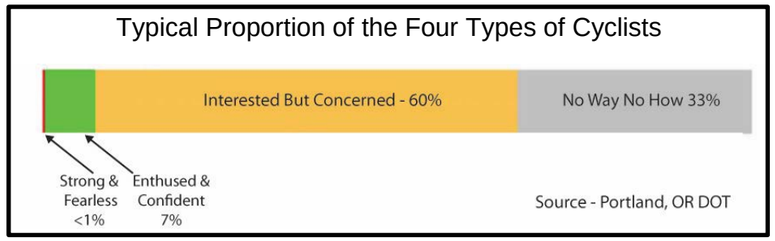
***Step 2:** Think of an adult, approximately **80 years of age** who you love and care for. This could be a parent, grandparent, friend etc.*

***Step 3:** Ask yourself: Would you send that 8 year old along with the 80 year old on a walk, or a bike ride on that infrastructure? If you would, then it is safe enough, if you would not, then it is not safe enough."*

Cyclists can be separated into two main groups, those who cycle as a form of transport to reach a destination, and those who cycle for fitness and recreation.

There are generally considered to be four different attitudes towards cycling:

- 'Strong and Fearless' cyclists are people who will cycle regardless of roadway conditions;
- 'Enthused and Confident' are comfortable sharing the roadway with general traffic but prefer to do so operating on their own facilities;
- 'Interested but Concerned' rarely cycle but would if they felt safer on the roadways with less and slower cars; and
- 'No Way No How' who are currently not interested in bicycling at all, for reasons of topography, inability, or complete lack of interest.



Source: Portland Office of Transportation

1.3 Bicycle Infrastructure

A variety of infrastructure is available for use by cyclists, as listed below. The minimum requirements for each type of infrastructure is also described:

- Footpaths
  - Provide limited priority for cyclists, however can legally be ridden by cyclists; and
  - Generally concrete, narrow (1.5m to 1.8m) with no signage or line marking.
- Shared Paths
  - Provide direct connections between primary routes and major trip generators such as shopping centres, industrial areas, major health and educational institutions, sporting and civic facilities;
  - Typically located on corridors situated within urban or built-up environments;
  - Typically vary in width from 2.5m to 3.0m;
  - Pavement surface can be concrete or asphalt (black or red);
  - Requires signage and pavement markings, and line markings; and
  - There are no official speed limits for cyclists by law on shared paths, however speed limits can be set by local governments.
- Separated Cycle Path
  - Typically located in areas of significant cycling and pedestrian demand; and
  - Similar purpose and design to a shared path, although signage and pavement markings indicate that the path is restricted to cyclist use only.

- Principle Shared Paths
  - Conducive to medium and long distance commuting, recreational and tourism trips;
  - Typically take the form of high quality shared paths and run alongside major roads and rail corridors, parallel to river and ocean foreshores;
  - In areas of high pedestrian activity, consideration should be given to separating cyclists and pedestrians;
  - Grade separation is preferred at major intersecting roads/railways to avoid interruptions to cyclists;
  - Generally owned and controlled by Main Roads WA; and
  - Consist of red asphalt, 3.0m to 3.5m width, signage and pavement markings and line markings.

- On-Road Cycle Lanes
  - Similar to shared paths, cycle lanes provide direct connections between primary routes and major trip generators;
  - Cycle lanes are located on-road on the outer edge of each direction of general traffic lane;
  - Typically vary in width between 1.2 – 1.5m;
  - Red coloured surface treatment along the cycle lanes helps indicate priority to cyclists;
  - Green coloured surface treatments are used to help indicate priority to cyclists at intersections. This should be used sparingly to maintain its effectiveness;
  - DoT guidance indicates the requirement for some form of separation/protection by 'soft' measures such as painted hatching, plastic kerbing or armadillos which is necessary to provide high quality; and
  - Vertical signage and bicycle symbol pavement markings are required.

- Safe Active Street (previously known as 'Bicycle Boulevard')
  - Typically form part of the local route network, which connects traffic from local roads within towns and suburbs and distribute it to the primary and secondary networks;
  - Safe active streets are constructed along low traffic and slow speed roads;

- Adopt ‘self -explaining street’ and ‘filtered permeability’ urban design principals;
- Typically involve a speed reduction to 30km/h, chicanes at regular intervals to slow vehicles, formalised parking bays, signage and pavement markings indicating an on-road environment shared by pedestrians, cyclists and vehicles; and
- DoT is currently in process of developing typical standards. There is the potential to integrate the design principles of Safe Active Streets into standard local area traffic management works.

1.3.1 Engineering Guidance

A range of best practice guidance is available for the selection of suitable cycle infrastructure which considers the environment and situation and desired user types.

Austroads – Cycling Aspects of Austroads Guides (2017 Edition)

Austroads provides recommendations for proposed on-road infrastructure relative to the volume and speed of vehicles along the road (see Figure 1-2).

This guide recommends that a shared environment is suitable with low volumes and speeds, cycle lanes are suitable for medium to high volumes relative to speeds ranging from 30 to 60km/h, and physical segregation is required for remaining scenarios.

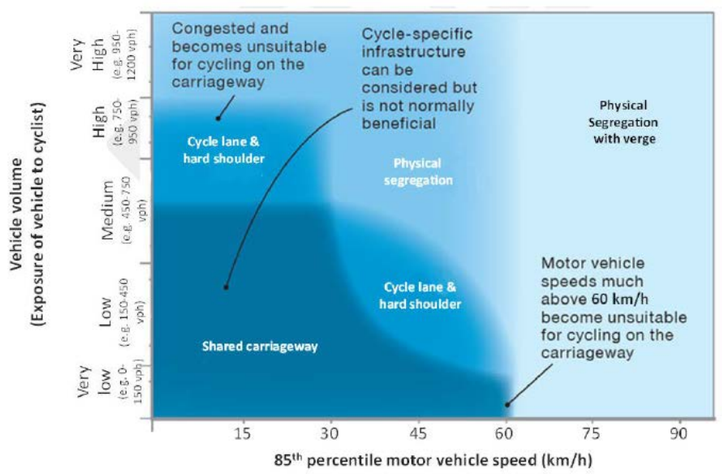


Figure 1-2: Recommended traffic volume/speed thresholds and cycle infrastructure (Source: Austroads)

Austroads also provides recommendations for proposed off-road infrastructure relative to the volume of pedestrians and cyclists along a bicycle path (see Figure 1-3).

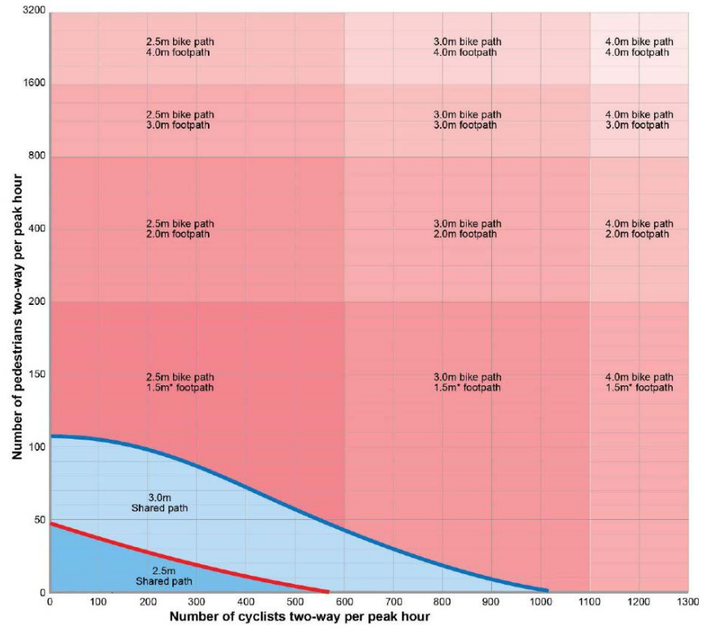


Figure 1-3: Recommended pedestrian/cyclist thresholds and cycle infrastructure for 50/50 directional split (Source: Austroads)

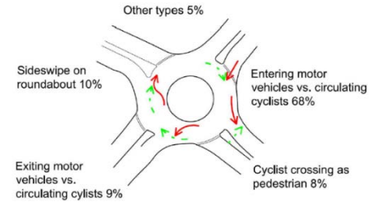
In general, the types of infrastructure preferred by various types of cyclists for different ride purposes are shown in Figure 1-4.

Figure 1-4: Preferred infrastructure for user types

Draft Main Roads Cycling Guidelines for Western Australia for Local Area Traffic Management (LATM) (November 2016)

The draft guidelines outline various traffic engineering measures to enhance cyclist safety at LATM devices. This guidance should be considered for all traffic management works across the local street environment in order to reduce any discouragement towards cycling due to inappropriate selection of traffic calming treatments.

Roundabouts are often safer than other types of intersections, although they may not be as safe for cyclists as other road users. The majority of crashes for cyclists at roundabouts occur when vehicles fail to give way to circulating cyclists (see Figure 1-5). Multi-lane roundabouts present even greater challenges for cyclists.



If a roundabout is to be located along a cycle route, the following treatments should be applied:

- On-road circulation: Cyclists are encouraged to ‘claim the lane’ and negotiate the roundabout in the centre of the circulatory carriageway. Bicycle pavement markings at the centre of the approach lanes can be used to highlight to motorists that cyclists are circulating; and
- Off-road navigation: Cyclists are encouraged to negotiate the roundabout without entering the circulating carriageway. Smooth transition paths at the approaches should be used to connect bike lanes to off-road paths and crossing points should be provided on the arms of the roundabout. Bypass paths should consider pedestrians and mobility aid scooters.

On-road circulation is more common for confident cyclists, although off-road navigation is considered safer and preferred by non-confident cyclists. Vehicle speed is major a contributor to safety concerns for cyclists at roundabouts. As a result, a number of speed reductions techniques can be used, including:

- Vertical deflection devices at approach arms, potentially in the form of wombat (raised zebra) crossings;
- Horizontal deflection devices at approaches (which may include semi-mountable aprons for heavy vehicles). These are generally preferred to vertical deflections if they do not create a squeeze point for cyclists;
- Tighter approach radii; and
- Consideration of radial (rather than tangential) roundabout design philosophy.

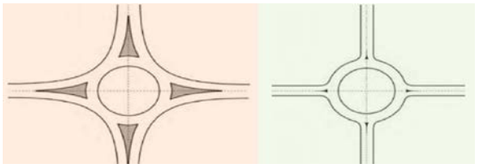


Figure 1-6: Tangential roundabout design (left, poor for cyclists) compared to radial design (right, better for cyclists) (source: Main Roads)

A range of alternative treatments are also available such as grade separation and cyclist priority at crossings.

1.4 The Future of Cycling

In a rapidly changing transport environment, how will cycling fit into everyday travel behaviour in the next 30 years? With advanced technologies, such as autonomous vehicles, set to become commercially available in the near future, what cycling infrastructure is needed now to future proof and integrate with these technologies?

Data Monitoring

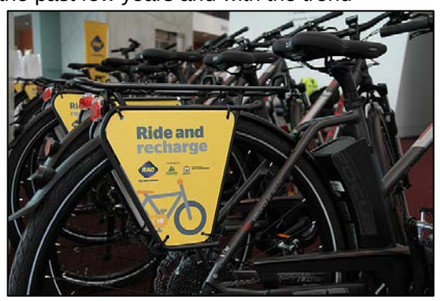
Technology advances have resulted in the development of software which enables piezoelectric strips to record bike volume, speed, direction, separation, and clusters, along with pedestrian volumes. This means that both cyclist and pedestrian usage can be calculated and analysed to get an accurate representation of the volumes of people that use an area at any specific time. This advancement can greatly assist in the planning of future pedestrian and cycling related infrastructure and investment.

Other cyclist-pedestrian counters, such as the Eco-DISPLAY, have been installed in various locations across the globe, each giving the public a visual display of path user numbers.

(source: *https://www.eco-compteur.com/en/*)

E-Bikes

With the increasing cyclist numbers over recent years, global cycling technology and developments have prospered beyond the wildest of expectations. The e-bike revolution, bike sharing schemes and safer street designs now make it easier, more affordable and safer for people to pedal their way around their city. An electronic bike, commonly referred to as an e-bike, is a form of assisted cycling, whereby a battery power source supplements the effort needed to get from A to B. Global e-bike sales have increased exponentially over the past few years and with the trend expected to continue, will see some 35 million sold this year alone. With this increase in popularity, many Europeans are expected to adopt e-bikes as a legitimate form of transport, allowing them to go further than before and with much less effort.



International Best Practise

For decades, the Dutch have been at the forefront of cycling culture and infrastructure. A cycling oriented mentality, coupled with innovative design, provides substantiating evidence to support the fact that Dutch people cycle, on average, 2.9 kilometres per day. To cater for these bicycles, the Utrecht municipality will soon complete the construction of the worlds largest bicycle parking facility. The 12,500 strong facility will greatly contribute to the regions parking facilities, increasing it to a total of 33,000.

Another addition to the Dutch cycling network is the Hovenring, a 72 meter diameter elevated roundabout (solely for cyclists) that facilitates the navigation of a busy intersection. A similar design was also previously implemented in Norway, with this structure separating cyclists from some 40,000 vehicles per day.

(source: *http://ipvdelft.com/portfolio-item/hovenring/*)

Countries around the world, including India and Iceland have installed creative 3-dimensional zebra crossings to help slow vehicles down in areas of high pedestrian activity. The idea came about as an alternative to speed humps which were not preferred by local authorities.

(source: *http://icelandreview.com*)

Smartphone Applications

The invention of the smartphone has revolutionised our way of life. They connect us to the world, can remind us to do things and with the help of applications (or 'apps') can help cyclists navigate the intricate network of cycle paths all over the globe. The map app, that is factory installed onto most smartphones, does well at navigating any street network. However, increased traffic volume along with restrictions on cycling activities, can make some roads dangerous and even illegal to cycle on.

A number of Cycling GPS apps currently exist on the smartphone market, such as:

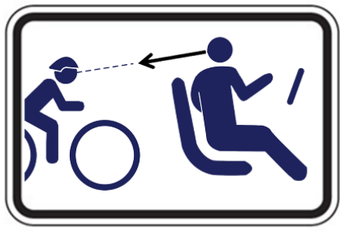
- *Ride with GPS* was released in 2007 and enables users to enter a destination, be navigated to that destination and track their ride whilst simultaneously being provided with their ride statistics and metrics. Available on both Apple and Android devices, the app has a focus on 'sharing' our ride with your network – from geotagged photos to outside software compatibility.

RIDE WITH GPS VOICE NAVIGATION

- *Bike Citizens* has over 450 downloadable city maps, which can find the best way to get from A to B. This app can be customised to suit the cyclist's confidence level as well as their level of urgency to get to their destination – planning a route to cater for their individual needs. Turn-by-turn navigation can easily guide the cyclist on a range of roads and bike paths, sharing their journey with the wider community. The collective data can be used by local planning authorities to make cycling schemes in urban areas easier to plan.

Apps, such as those mentioned above, represent the future of recreational and social cycling. With the rapid development of technology, resulting in increased mobile phone battery life, the useability and application of GPS apps will continue to grow into the future.

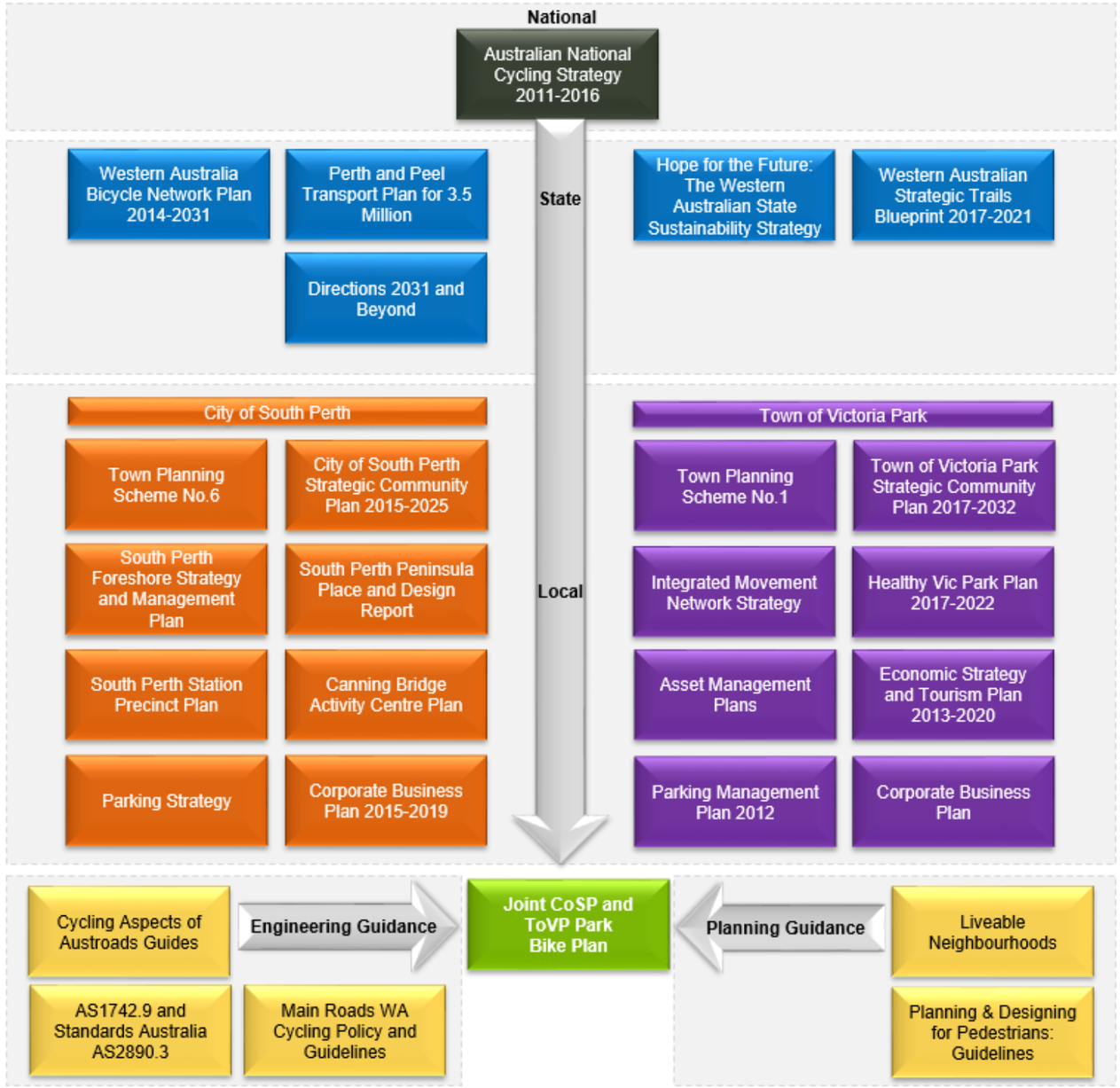
All the above initiatives aim to make cycling more enjoyable and ultimately a safer form of transportation. There are also non-infrastructural means of increasing cyclist safety. Simple spatial awareness by employing such methods as the 'Dutch reach' (*https://www.dutchreach.org/*) to open your car door, makes it safer for cyclists and the public. Many local governments have begun to recognise the benefits that cycling can provide – a better lifestyle, enhanced sense of community and reduced traffic congestion to name a few.



Increased levels of investment, along with the adoption of a cycling mentality, mean that the future of cycling in Australia looks promising. Governments and councils all over Australia are working with the community to better plan, prioritise and deliver better connected cycling infrastructure to increase the percentage of cyclists nationally.

2 Policy and Strategic Context

A range of national, state and local policies and strategies are applicable to the preparation of the Plan. The relationship between the policies and strategies for both the CoSP and ToVP and how they pertain to each other and the Plan is diagrammatically represented in Figure 2-1. This section describes how each of these influences the Plan in more detail.



2.1 National

On a national level the policy documents intend to promote a standardised level of planning for various levels of government.

2.1.1 Australian National Cycling Strategy, 2011-2016 (Australian Bicycle Council)

The Australian National Cycling Strategy (NCS) set out a series of actions intended to deliver the overarching vision to double the number of people cycling in Australia over the five year period of the strategy. The NCS focused on areas considered critical to maintaining momentum regarding cycling, whilst aiming to ensure that all local planning and transport plans are fully integrated and address the needs of cycling.

Following a review of the NCS in 2017, it was reinforced that increased walking and cycling is in the national interest whilst identifying that a fresh approach to national cycling and walking coordination is required. As a result, it was decided that there is no immediate need for a new national cycling or walking strategy in the short term. The Australian Bicycle Council (ABC) is proposed to be reformed into the *Cycling and Walking Australian/New Zealand* (CWANZ) group which is expected to be established by May 2018. CWANZ will be responsible for the national coordination of action on cycling, whilst focusing on a small number of strategic actions that aim to deliver outcomes that are in the national interest and that cannot be delivered effectively by jurisdictions working alone. It is also intended that the scope is expanded to include walking.

On a national level, the following objectives will be a key focus for CWANZ:

- **Cycling and Walking as an integral element of liveable, healthy and productive communities;**
- **Increased investment in cycling and walking from all levels of government;**
- **Applied innovation and learning; and**
- **National consistency and harmonisation.**

The implementation of the joint Bike Plan supports the goal of the NCS in doubling cycling mode share and incorporates a series of actions to create a comprehensive network of safe and attractive cycling routes.

2.2 Western Australia

2.2.1 Directions 2031 and Beyond (Department of Planning, WA Planning Commission, 2010)

Directions 2031 recognises the importance of walking and cycling as not only the most sustainable form of transport, but also a major contributor to the health of our communities and for the contribution it can make to the overall travel picture as other parts of the movement network become more heavily congested. The framework also encourages a long-term approach to the provision of infrastructure in an economically sustainable way.

The following outlines the key messages that guide the way forward in terms of bike planning:

- Encourage increased opportunities, and a shift to more sustainable transport modes including cycling;
- Activity centres that are integrated with and encourage the efficient operation of the transport network, including the promotion of cycling;
- Encourage local government to institute public open space strategies to encourage cycling as part of the overall community health picture; and
- Finalising the review of and subsequently implementing the Perth bicycle network to build upon the current cycling infrastructure and policy development to support state and local government initiatives to increase cycling activity.

2.2.2 Western Australian Bicycle Network Plan (DoT, 2014-2031)

The Western Australian Bicycle Network Plan (WABN) is part of the DoT Integrated Transport Framework and Moving People ideology. The WABN Plan aims to leave a lasting legacy for cyclists and potential cyclists. The WABN Plan replaces the Perth Bicycle Network as the strategic level of planning for WA and Perth.

The WABN Plan is focussed on achieving several strategic initiatives to provide a safe and sustainable cycling network to ultimately promote and encourage cycling as a mode of transport. The key recommendations of the WABN Plan include:

- Expansion of the PSP network;
- A feasibility study for an end-of-trip facility in the CBD;
- A connections to schools program;
- A connections to rail/major bus stations program;
- Review of traffic management on local roads;
- Review of the local bicycle routes;
- Development of an online journey planner;
- Planning for cycling facilities in larger regional cities;
- Formulation of a WABN Implementation Reference Group; and
- Biennial review of the Plan.

A clear theme throughout the plan is that Perth has significant potential for increased cycling should infrastructure be provided and current attitudes be contested.

2.2.3 Perth and Peel Transport Plan for 3.5 Million (WA Department of Transport, 2017)

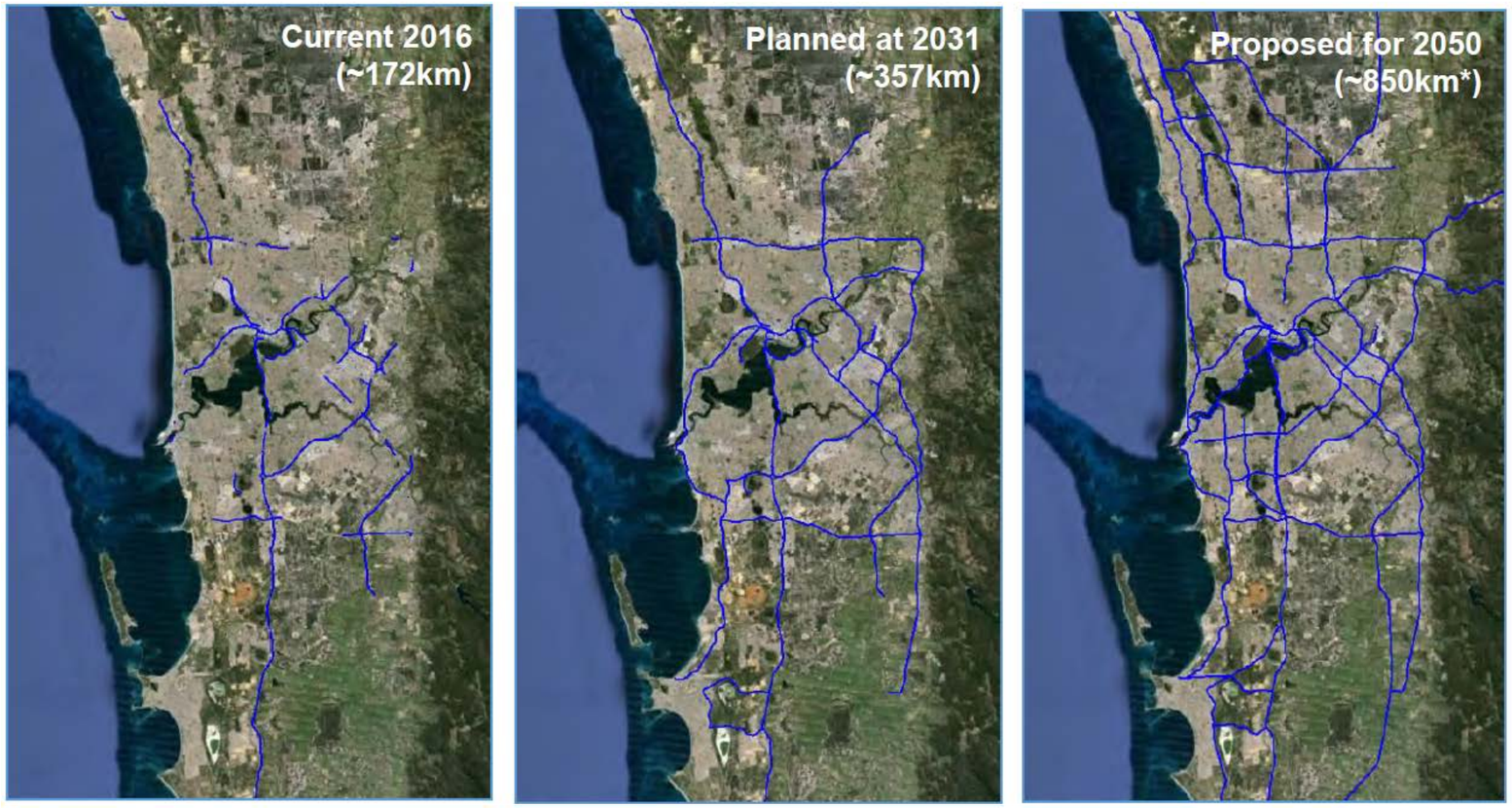
The Perth and Peel Transport Plan (PTP) establishes the transport infrastructure that is needed in the long term to ensure Perth remains one of the most liveable cities in the world. The PTP presents several infrastructure projects with reference to population-based timelines of 2.7 million, 3.5 million and beyond 3.5 million in the Perth and Peel region. The following key objectives of the PTP relate to cycling:

- The need for Perth to have a transport network that optimises use of the existing network as it grows;
- The need for integration of land use across the public transport, active transport and road networks; and
- Provision for a safe, connected active transport network of primarily off-road cycleways and walkways.

The PTP aims to deliver the following outcomes, related to cycling:

- Increase cycling and walking to 18 per cent of all day trips;
- Reduce the mode share of car driver trips to 50 per cent of all-day trips, and to 29 per cent of peak period trips to the CBD.

The PTP identifies that Perth light rail will create an important connection with Canning Bridge, Curtin University, Victoria Park, Perth CBD and the Queen Elizabeth II (QEII)/ University of Western Australia (UWA) precinct. The PTP also identifies a number of 'Green Bridges' which aim to improve travel times and connectivity for cyclists and pedestrians across rivers and lakes. In particular, the Heirisson Island Bridge is proposed to be built by the time Perth reaches a population of 2.7 million, intended to replace the existing off-road shared path on the Causeway (intended to be reconfigured to accommodate light rail). Additionally, the current 172 km of off-road commuter and recreational cycleways is proposed to be extended to approximately 850 km, with 185 km added by the time the Perth population reaches 2.7 million, and 500 km by 3.5 million.



2.2.4 Hope for the Future: The Western Australian State Sustainability Strategy (Government of WA, 2003)

This strategy was developed by the State Government in 2003 and establishes illustrative actions for sustainability in Western Australia, recognising that overcoming car dependence is fundamental to sustainability in cities. One chapter of the strategy focuses on "Sustainability and Settlements," with a priority area identified as "integrating land use and balanced transport." An objective of this item was to "achieve a more sustainable balance between car use and other transport options through the promotion and provision of efficient and effective public transport and non-motorised personal transport alternatives."

2.2.5 Western Australian Strategic Trails Blueprint 2017-2021

This is an overarching guide for consistent and coordinated planning, development and management of quality trails and trail experiences across Western Australia. It provides a vision, guiding principles, strategic directions and actions for consideration across the State for government, trail managers, landholders, trail support groups, tourism operators and the community. Some cycle paths used for recreational use in Perth are part of the trails portfolio, which are in close proximity to CoSP and ToVP.

2.3 Local Government

City of South Perth

2.3.1 Town Planning Scheme No.6

The CoSP's *Town Planning Scheme No.6* outlines how land is to be used and developed within the city. It classifies areas for land use and includes provisions to coordinate infrastructure and development within the local government area. The overriding objective of the Town Planning Scheme is to require and encourage performance-based development in each of the 15 precincts of the City in a manner which retains and enhances the attributes of the City and recognises individual precinct objectives and desired future character as specified in the Precinct Plan for each precinct.

Bicycle parking requirements for various land uses, are outlined in the scheme in addition to provisions of end-of-trip facilities for staff. The South Perth Station Precinct and Canning Bridge Activity Centre each have specific bicycle parking and end-of-trip facility requirements.

2.3.2 Parking Strategy (2015)

The Parking Strategy provides a strategic citywide parking framework for the short, medium and longer terms and identifies a comprehensive action plan to assist in the future preparation of Parking Control Areas (PCA) plans. The strategy supports and encourages different forms of sustainable transport. It recommends investing funding from parking into sustainable transport initiatives such as cycle paths and other cycling support facilities.

2.3.3 Canning Bridge Activity Centre Plan (2016)

This Canning Bridge Activity Centre Plan (CBACP) has been prepared to provide a guide to development of the CBACP area. It is proposed that the CBACP area will comprise of a mix of residential, civic, office, retail and entertainment uses against the backdrop of the Swan and Canning Rivers and the adjacent open space. The CBACP establishes a foundation for the future of the area including objectives and goals for its ongoing development, guidelines for the style of built form which is expected, and an implementation framework for orderly improvements to infrastructure and land over time. The future cycle network is detailed, outlining the proposed infrastructure and the potential conflict points. Provisions for end of trip facilities are also outlined for new developments.

As part of the proposed public transport interchange, which includes rail, bus and ferry services, consideration for priority cycle access and parking is required, with a focus on maximising convenience and safety.

2.3.4 South Perth Station Place and Design Report (2017)

The report sets the vision and direction of the South Perth Peninsula area, with one of the key goals to improve movement and connectivity. A modal shift from private vehicles is emphasised as part of this goal and hence strategies for improving the cycling network are proposed. One of the key recommendations is for the development of an Integrated Transport Plan.

2.3.5 South Perth Station Precinct Plan (2011)

The South Perth Station Precinct Plan guides development in the precinct surrounding the planned South Perth railway station on the Perth/Mandurah line. A number of cycling links throughout the precinct are to be enhanced to be safer and more attractive for use.

2.3.6 South Perth School Bicycle Infrastructure Audit (2014)

The South Perth School Bicycle Infrastructure Audit assesses bicycle infrastructure surrounding four primary schools; Collier, Como, Kensington and South Perth. A prioritised work schedule was developed for each school with a focus on addressing safety issues.

2.3.7 City of South Perth Strategic Community Plan 2015-2025 (2015)

The Strategic Community Plan 2015-2025 is the overarching plan to guide the Council over the next 10 years and has a long-term focus and emphasis on the community's aspirations, priorities and vision for the future. Infrastructure and Transport is a key emergent theme from the plan that prioritises a safe transport network that is cycle friendly.

The Plan details that sustainability is at the core of the community's expectations and underpins the City's Integrated Planning and Reporting Framework. The current Sustainability Strategy 2012-2015 is due to be updated in 2017-18 to further align with this.

2.3.8 South Perth Foreshore Strategy and Management Plan (2015)

The South Perth Foreshore Strategy and Management Plan (The SPF Plan) guides the management of the foreshore into the future, balancing the competing demands for use. Strategies and priorities for the SPF are outlined, to guide the long-term plan to revitalise the foreshore and adjacent commercial and tourist precincts. As such, the SPF Plan outlines four area-wide strategies and 10 prioritised site specific nodes that require revitalisation. Transport and access is one of the four area-wide strategies and Mends Street is identified as the highest priority node. The Mends Street project forms the basis of the 'Connect South' project which will include a $7.5 million upgrade by 2020, including upgrades to several roads in the precinct.

2.3.9 National Cycling Participation Survey (2017)

The National Cycling Participation Survey (NCPS) is a standardised survey that is repeated biennially to estimate the participation for each state and territory. This report aims to complement this by collecting data from a sample within South Perth to better analyse participation within the local government.

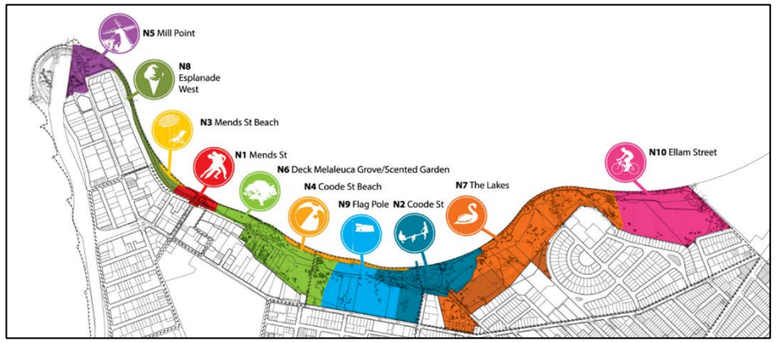
Overall, participation in CoSP is higher than average for Perth and Western Australia, with approximately 10,200 South Perth residents cycling in a typical week. The highest cycling participation rate for CoSP was among children aged under 10 which was considerably higher than Perth. Recreational use for cycling was higher than for transport. Commuting was the highest purpose for cycling as a form transport (compared to education, public transport, shopping, visiting people). Perceptions were also measured, which showed that overall, most CoSP residents either feel comfortable or very comfortable about riding in the area.

2.3.10 Major Developments

Connect South Project

Connect South is a major project to enhance and invigorate the Mends Street precinct and foreshore area. The precinct was identified as the highest priority of ten node strategies in the South Perth Foreshore Strategy and Management Plan

Connect South will deliver a piazza on the foreshore as well as streetscape and amenity improvements, landscaping upgrades and place activation activities. A key strategy for the entire foreshore, as indicated in the South Perth Foreshore Strategy and Management Plan, is to identify transport considerations aimed to reduce car use and conflict between modes of transport, and investigate multimodal transport options. Cycling is a major area of consideration for Connect South and must also be integrated with any future plans for upgrades along the South Perth Esplanade.



Clontarf-Waterford-Salter Point Foreshore Area

The City is developing a masterplan for the section of foreshore from Clontarf through to Waterford and Salter Point. The Masterplan will provide a consolidated management strategy recognising the ecological, cultural and recreational values of the area. The Joint Bike Plan identifies the entire foreshore path as a long term cycle route within the City of South Perth, including a potential future cycling connection to the principal route along the Kwinana Freeway. It is proposed that cycle infrastructure is investigated to be provided along the full length of the foreshore to provide consistency and legibility and to capitalise on the beautiful scenery that is offered and encourage increased cycling in the community. The Plan aims to acknowledge a future cycling connection to the Mt Henry Bridge as a long term aspiration and one that will require significant further investigation and community consultation. An alternative route connecting to the Kwinana Freeway will need to be considered as part of this investigation.

Town of Victoria Park

2.3.11 Town Planning Scheme No.1 and Local Planning Policies

The Town of Victoria Park's *Town Planning Scheme No.1* is the instrument for controlling and guiding development and growth within the ToVP.

A key objective of the scheme includes catering for the diversity of demands, interests and lifestyles, where this Plan plays a key role. The scheme also aims to protect and enhance the health, safety and general welfare of the Town's inhabitants and the social, physical and culture environment of the Town, all of which are strengthened by the implementation of this Plan.

Precinct Plans

Each precinct within the ToVP is detailed for its intent based on what is seen to be appropriate for the precinct. Information is provided about the purposes for which land may be used and guidelines for the development of land and buildings. Consistent among each precinct is the consideration of safe and accessible provision for pedestrians, cyclists and motorists. Council will require that new developments and redevelopment of existing facilities take into consideration pedestrian access and safety, and make appropriate provisions for cyclists.

Local Planning Policies

A number of local planning policies provide specific guidance to cycling facilities, including:

- **Design Guidelines for Burswood Lakes – Policy 9**
  - This policy outlines the design guidelines for the Burswood Lakes project.
- **Design Guidelines for Developments with Buildings above 3 Storeys – Policy 20**
  - These Design Guidelines set the planning and design framework for any development incorporating buildings above 3 storeys or 11.5 metres in height.
- **Development Standards for Causeway Precinct– Policy 22**
  - This policy outlines the standards for the Causeway Precinct and includes provisions for cycling.

2.3.12 Local Planning Policy 23 – Parking Policy

This Policy consolidates the Council's parking requirements, and outlines its approach to the provision of parking facilities for non-residential and residential uses in the Municipality. The policy addresses the impact of parking facilities on pedestrians and cyclists and aims for parking facilities to have safe, convenient and efficient vehicle and bicycle access for pedestrians, cyclists and motorists.

There are currently no detailed bicycle parking requirements for developments within the ToVP, however these are currently being developed for inclusion in the planning scheme.

2.3.13 Integrated Movement Network Strategy (IMNS)

The IMNS is a strategic document for the period up to 2031 and considers all modes of transport and the movement needs of all users, now and in the future. Key objectives and outcomes that form the IMNS include:

- Enhancement of the urban environment and amenity with greater emphasis on provision for bicycle and pedestrian paths and connections to, and interchange with, public transport;
- Improved access to employment, entertainment, medical, education and community facilities, while considering the needs of people with mobility, visual or hearing impairment;
- Reduced transport cost for the community by providing better public transport services, improving pedestrian and cycling facilities and enhancing permeability throughout the Town;
- Creation of a healthier and more accessible community through encouraging active travel such as cycling and walking; and
- Improved environmental conditions through less reliance on private motor vehicle transport.

The overarching strategy for cycling and walking is:

"Greater priority afforded to pedestrians and cyclists (particularly around Activity Centres); proactive identification of measures to improve universal access; greatly improved facilities and infrastructure through more prescriptive requirements in the Town Planning Scheme (TPS)."

2.3.14 Healthy Vic Park Plan 2017

The Public Health Act 2016 requires all local governments to develop a local Public Health Plan, which is currently being finalised for the Town. The goal of the plan is to provide opportunities for all residents and visitors to achieve and maintain good health and wellbeing.

From the community engagement process, the community rated 'infrastructure for walking and cycling' as the number two public health priority, following parks and public open spaces. The community rated 'physical inactivity/ low exercise levels' as the third most important health risk factor.

Figure 2-3: Results for the Community Survey (source: Draft Healthy Vic Park Plan)

The development and implementation of a bike plan is a key action of the Healthy Vic Park Plan. Additionally, the following actions are supported by the Bike Plan:

- Promote active transport methods for the community and schools;
- Develop and implement a Laneway Activation Strategy;
- Deliver and support programs and initiatives that encourage a physically active lifestyle;
- Delivery programs and initiatives that encourage the use of active transport including Your Move;
- Implement Crime Prevention Through Environmental Design (CPTED) principles in structure plans, local development plans and development assessment; and
- Promote and encourage premier public events in the local community.

2.3.15 Parking Management Plan 2012

The purpose of the Plan is to provide a framework for implementing parking management changes to address identified existing parking problems in Hotspot Areas. The techniques proposed include:

- Encouraging businesses to develop transport plans in support of recruitment and retention of staff by providing end of trip facilities for staff who walk, run or cycle;
- Implementing paid parking, with part of the revenue allocated to cycle infrastructure works; and
- Replacing some parking bays on streets with bicycle parking bays.

2.3.16 Asset Management Plans

The suite of Asset Management Plans (five in total) describe how the Town's assets will be managed over the next 15 years to a standard reflective of the community's desires and affordability. The community's desires were identified from the community consultation process, in which provision of alternative modes of transport such as bus, train, bikes and light rail was priority.

2.3.17 Economic Strategy & Tourism Plan 2013-2020

The *Economic Strategy & Tourism Plan provides* a strategic agenda to support the growth of the Town as one of Australia's most dynamic urban communities. Economic infrastructure development and productive precinct development are two of the core drivers of the economy identified, and are supported by the Plan. Relevant actions include:

- Ensuring there is suitable access for pedestrian, cycling and vehicles for neighbourhood shopping nodes; and
- Utilising the Town's facilities to hold major events such as those for cycling.

2.3.18 Other Plans

The joint Bike Plan supports the objectives of several other local planning documents, including:

Strategic Community Plan 2017-2032

The Strategic Community Plan is the principal strategy and planning document for the ToVP that reflects community long-term vision, values, aspirations and priorities with consideration to local government area/place/regional plans, local government strategies and resourcing.

One of the community's key priorities is creating a place that allows sustainable, safe and convenient transport options for all users, with this Plan directly attributing to this outcome.

Disability, Access and Inclusion Plan (DAIP) 2018-2023

The DAIP guides the ToVP in its intention to strive to provide and promote access and equity in service provision for all members of the community. All recommendations and design outcomes of this Plan must be aligned with the DAIP and consider universal access and design to ensure safe and convenient access for all members of the community. The development of the DAIP 2018-2023 is currently in progress.

Environmental Plan 2013-2018

The Environmental Plan is the main strategic document directing environmental management for the ToVP, focusing on several key objectives, including climate change adaption and greenhouse protection.

The ToVP was previously involved in the TravelSmart Cycling 100 initiative which supported the objective of the Environmental Plan in reducing greenhouse pollution. The initiative offered a free bike to staff who participated in the program which required riders to meet monthly cycling targets over a one-year period.

2.3.19 Major Developments

The following major development areas are proposed within the ToVP, which offer the opportunity to provide improved cycling facilities:

Taylor Reserve and McCallum Park

Taylor Reserve and McCallum Park is proposed to be redeveloped in line with the Town of Victoria Park's *2015 Foreshore Access and Management Plan.* The draft Concept Report (2017) details a variety of new high-quality spaces throughout the park with the intention to create a destination for the region, whilst maintaining the core function as an event space. Four precincts are proposed including a Parkland and Event Space, Beach and Activity Node, River Edge and Revegetation and Parking.

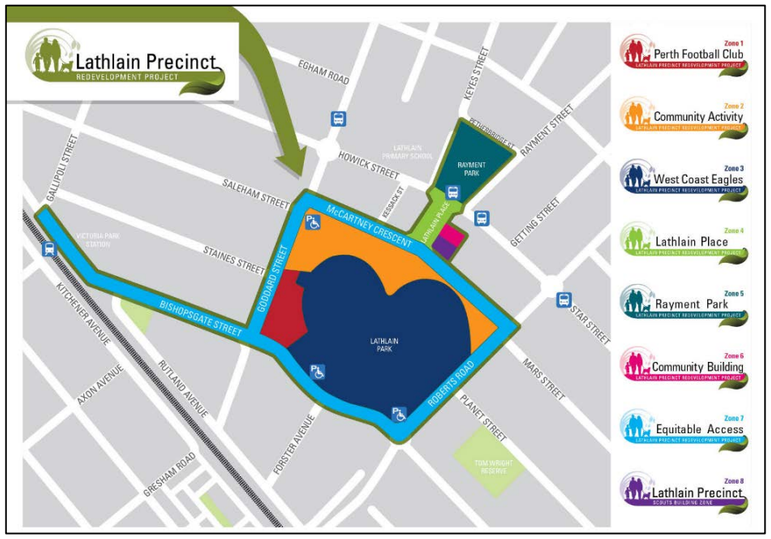
The existing separated cycle path along the foreshore is proposed to be realigned to the rear of the site and connected to the existing cycle paths on both sides of the park. This will provide cyclists with a direct route with minimal interruptions caused from other users of the park. The development of the concept is currently in progress.

Lathlain Precinct Redevelopment Project

The Lathlain Precinct Redevelopment Project (LPRP) involves the redevelopment and/or revitalisation of eight project zones within the Lathlain Precinct. The project is currently underway and is being delivered by the ToVP in partnership with the West Coast Eagles, the State Government, the Federal Government and the Perth Football Club.

The project involves the delivery of active community recreation space in addition to new headquarters for the West Coast Eagles football club.

The Lathlain Precinct will form a key recreational destination for the local community, and therefore cycle access needs to be considered.



2.4 Curtin University

Curtin University is one of Perth's major educational institutions and it's Bentley Campus is located within ToVP, adjacent to CoSP. The campus is part of the Bentley-Curtin specialised activity centre, and is planned to transform into a high activity area open to the entire community. A high demand for cyclists travelling to Curtin University currently exists, which is expected to increase as the area develops.

The following planning documents and studies are relevant to the development of the Plan:

- The Greater Curtin Master Plan (2013) sets out Curtin University's vision for growth and how this can be achieved. Movement is an area of focus, with a cycle network proposed, with strong external connections;
- The Curtin University Cycling Access Management Plan Draft (2015) assesses the adequacy of existing cycle parking, end-of-trip facilities and cycle access routes at Curtin University and identifies a number of required improvements;
- The Draft Bentley-Curtin Specialised Activity Centre Structure Plan (2016) identifies the proposed cycle network in the form of on-road cycle lanes, pedestrian and cycle shared paths, cycle friendly streets and shared space environments;
- The Integrated Transport and Movement Plan (2017) provides a framework for achieving the Greater Curtin Master Plan's vision for transport and movement. A cycle network capital works program is recommended to be undertaken to understand the amount of works required, and how it can be implemented; and
- The Draft Curtin University Students Staff Mapping Report (2016) identifies the combined population of current students and staff across the metropolitan area. The report identifies the following suburbs with the highest concentration of staff and students:
  - ToVP: Bentley and St James;
  - CoSP: Karawara, Waterford, Como, Manning and Salter Point;
  - City of Canning: Bentley, Wilson, Cannington, Queens Park and East Cannington; and
  - City of Gosnells: Kenwick and Beckenham.

  As shown in Figure 2-4, most of these suburbs are located within eight kilometres of Curtin university, which indicates that cycling is a suitable method of travel for a large number of Curtin university staff and students.

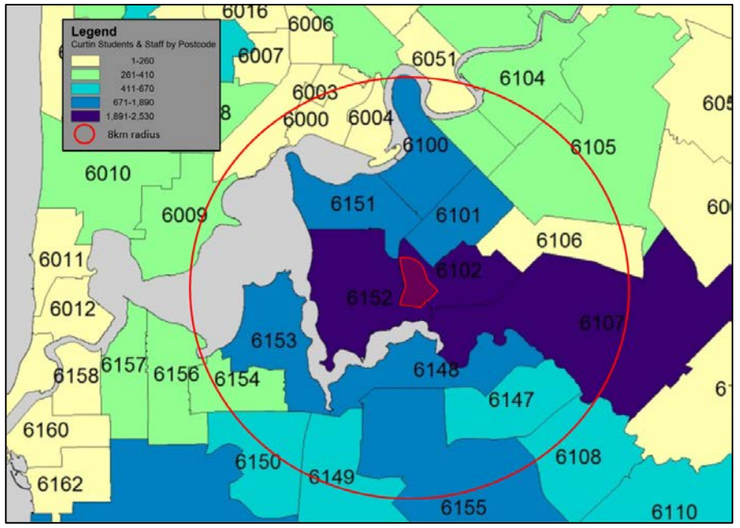


Figure 2-4: Curtin University Mapping

The future of universities and higher education is uncertain. The technological impact of robotics and artificial intelligence on professional careers could change the way universities function in the future, and ultimately change the way people interact and travel to Curtin University. The CoSP and ToVP should keep in close consultation with Curtin University as technologies continue to develop.

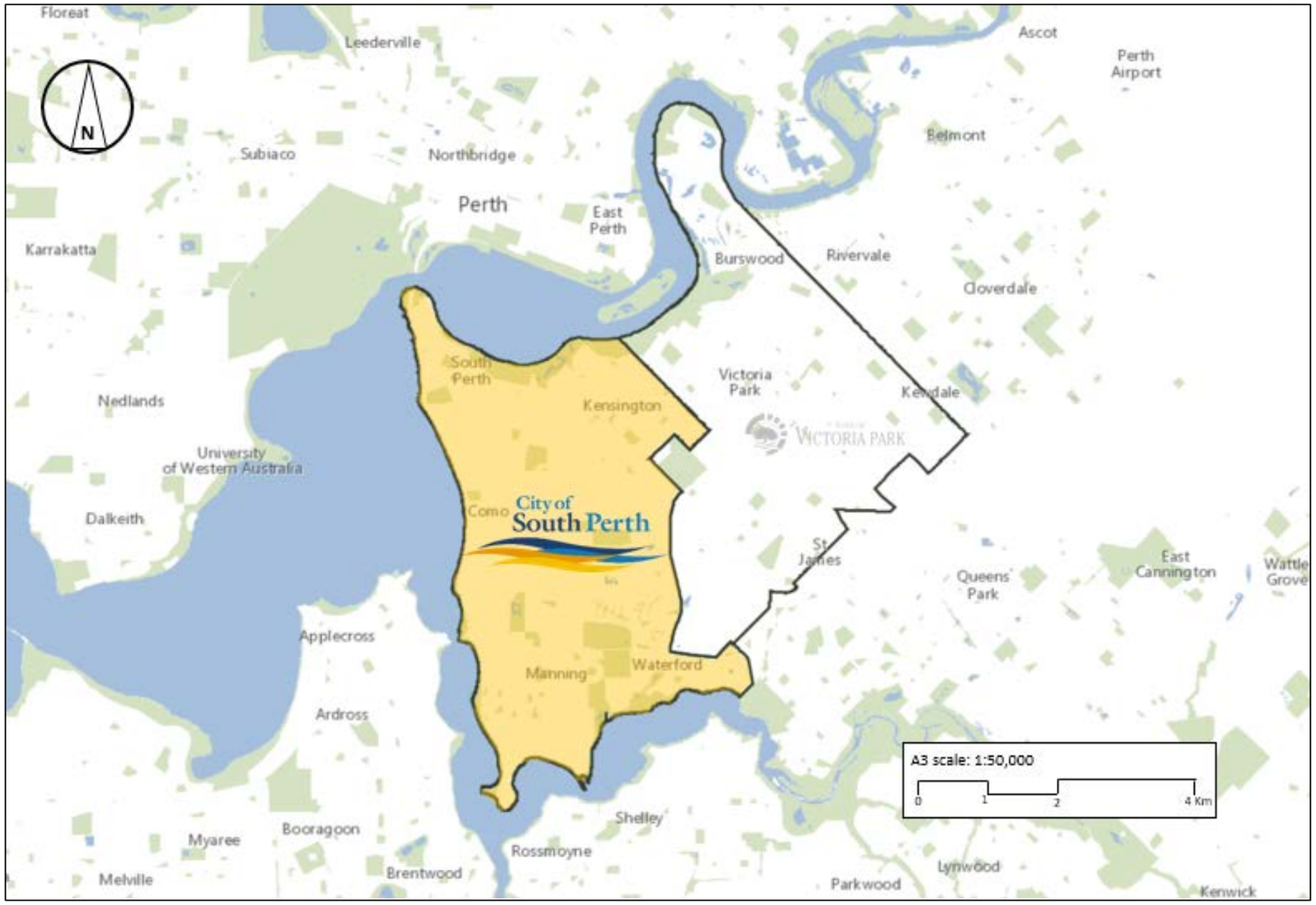
City of
South Perth

3 Background

The CoSP is located approximately four kilometres south of Perth's Central Business District (CBD) and covers an area of approximately 19.9 square kilometres. The CoSP shares boundaries with the ToVP and City of Canning, whilst providing direct routes over the Swan River into the City of Melville and City of Perth.

With reference to the CoSP Community Profile (*profile.id.com.au*, 2017) the estimated resident population as of June 2016 is approximately 44,000 with a population density of 23 persons per hectare. In the development of this Bike Plan, the diverse population within the CoSP was taken into consideration. Some of the key demographic statistics for the CoSP include:

- 1.6x higher population than the City of Perth, and 1.3x higher density;
- 53% medium and high density housing;
- A median age of 37 years;
- Approximately 59% of residents have a tertiary qualification;
- Approximately 36% of residents were born overseas, indicating strong cultural diversity;
- Approximately 65% of households have only one or two occupants; and
- 50% of households had access to two or more motor vehicles compared to 57% in Greater Perth. Car ownership per household in the CoSP did not change significantly between 2011 and 2016.



The abovementioned statistics highlight the potential for increased cycling trips in the CoSP. For example, the high percentage of households with one or two occupants highlight the potential for increased local shopping trips by bicycle due to smaller quantities of shopping that may not require the storage space of a motor vehicle.

Increased cycling in the CoSP will provide enormous environmental, health and economic benefits to the community including:

- Reduced car use, resulting in less traffic congestion, demand for parking, carbon emissions, and neighbourhood noise, and improvements in air quality;
- Improved physical and mental wellbeing;
- Reduced household travel costs, and potential time savings; and
- Increased foot traffic around local businesses.

Investment in creating an active community will result in better connected safer, healthier and happier residents and will make South Perth a more vibrant place to live and visit.

With reference to the CoSP Community profile (*profile.id.com.au*, 2017), the current statistics for travel mode to work for CoSP residents is shown in Figure 3-1. It indicates that approximately 65% of trips are undertaken by car (as either driver or passenger), approximately 13% of trips are by public transport, and 2.5% of trips by bicycle. Considering the proximity to the CBD and approximately 42% of South of Perth residents work in South Perth and Perth CBD, there is potential to increase the percentage of cyclists.

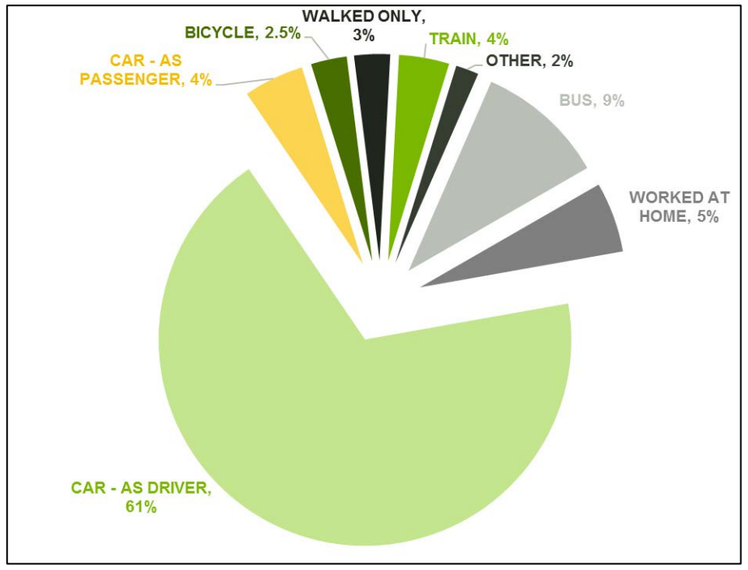


Figure 3-1: CoSP Mode of Travel (Census 2016)

The age group distribution within the CoSP is shown in Figure 3-2. In comparison to Greater Perth (Perth Metropolitan), there is a higher proportion of 18 to 24 year olds (tertiary education and independence), 25 to 34 year olds (young workforce), 50 to 59 year olds (older workers and pre-retirees) and 60 to 69 year olds (empty nesters and retirees).

In 2016 there were approximately 13,000 people who work in the CoSP, with 29% living in the area (refer to Figure 3-3).

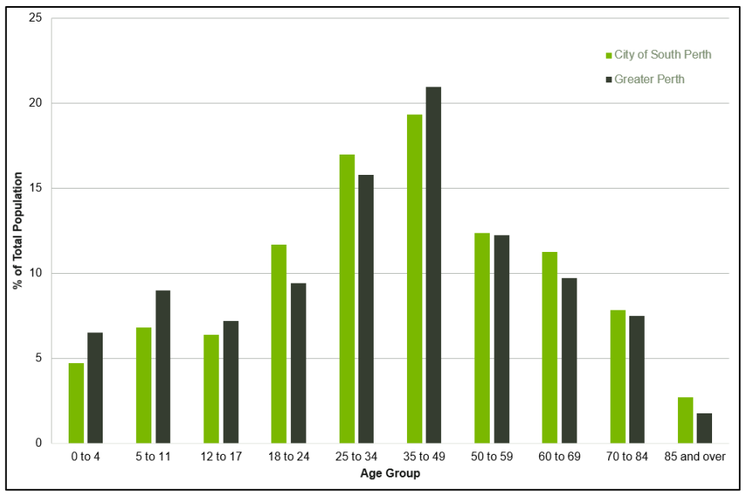


Figure 3-2: CoSP age group distribution (Census 2011)

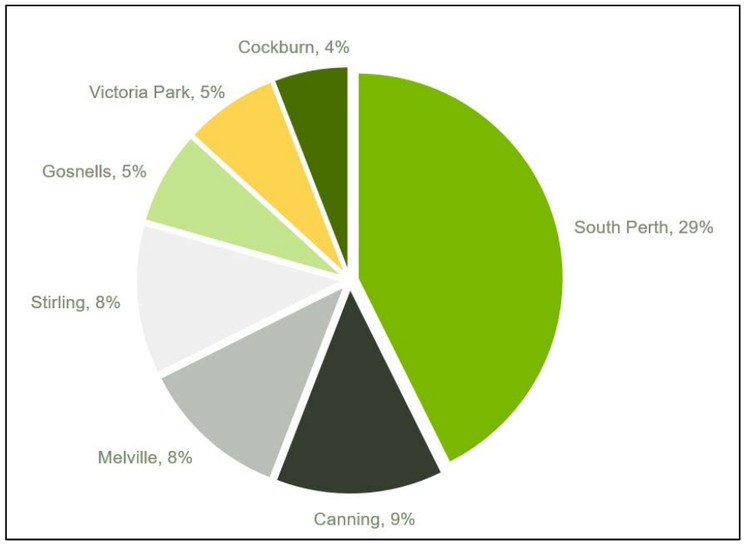


Figure 3-3: CoSP workers location of living (Census 2011)

In addition, approximately 79% of employed residents work outside of CoSP while the rest work within the area. A more detailed breakdown of employment locations is shown in Figure 3-4.

The cycling participation rate by residents of South Perth when measured over the past week or month is higher than average for Perth and Western Australia, as indicated by the 2017 National Cycling Participation Survey. Approximately 10,200 South Perth residents cycle in a typical week and 19,700 resident cycle at least once in a typical year.

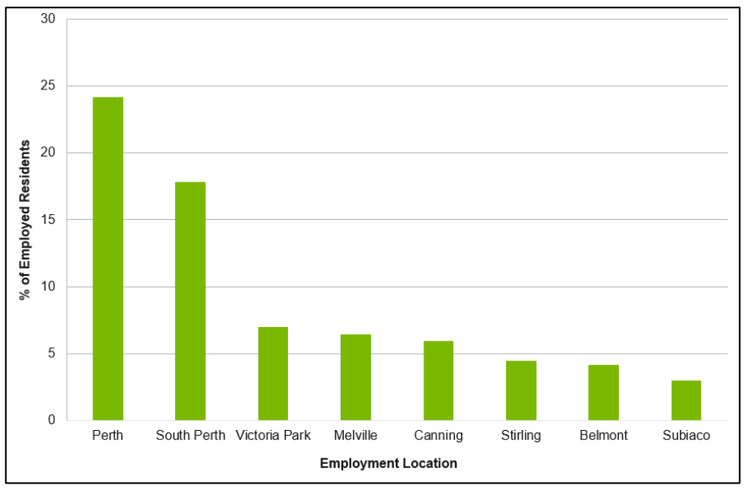


Figure 3-4: Employment location of CoSP residents (Census 2011)

4 Crash Analysis

4.1 Crash Data

Safety is a very important factor in building a successful Bike Plan. The availability and quality of existing cycle facilities is a good way of identifying the level of safety performance within a region. Main Roads WA crash data was utilised to determine the level of safety for the existing facilities within the CoSP.

Over the last five year period from 1 January 2012 to 31 December 2016, a total of approximately 4,500 crashes have occurred within the CoSP, with 2.6% of them involving cyclists. The number and severity of crashes involving cyclists per year is shown in Figure 4-1.

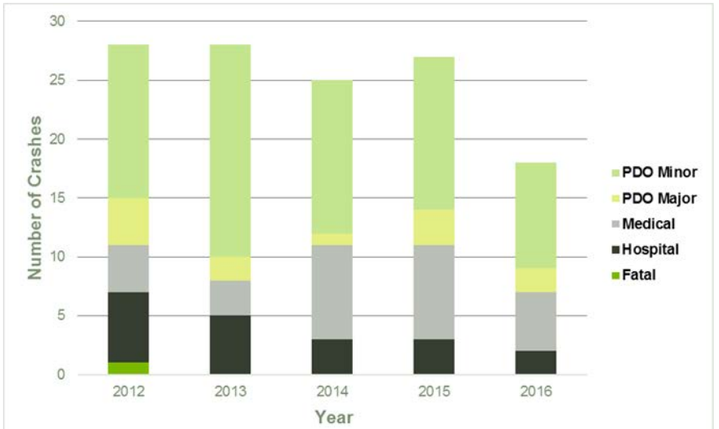


Figure 4-1: Total recorded crashes involving cyclists

In summary:

- A total of 126 crashes involved bicycles;
- 1 resulted in fatality;
- 15% resulted in hospital treatment; and
- 22% resulted in medical attention.

It should be noted that crash data only contains records of reported crashes, although unreported crashes are typical when there is no personal injury and no damage to property. It can be seen that the number of crashes have fluctuated from year to year with 2016 recording the lowest number of crashes in recent years.

Factors that can attribute to an increase in the number of crashes include a general increase in traffic volumes and non-compliance with speed limits. The reduction in crashes involving cyclists in 2016 is positive, however the Plan requires a strong focus on improving safety for cyclists.

The total number of recorded crashes from 2012 to 2016 grouped by severity is summarised in Figure 4-2 and illustrated in Figure 4-3.

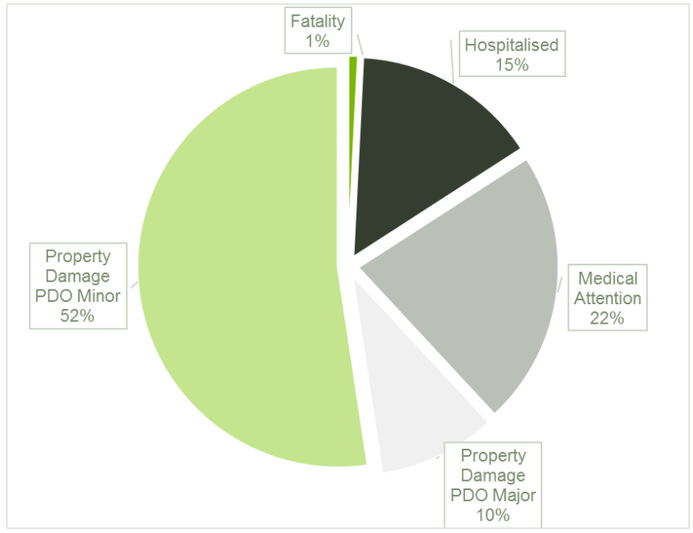


Figure 4-2: Total recorded crashes by severity

4.2 Crash Locations

More than 61% of the total recorded bicycle crashes have occurred at intersections, with 30% of the intersection crashes occurring at roundabouts. This is somewhat unsurprising as intersections, including roundabouts, often create 'pinch points' where space has not been allocated for cyclists.

The roads within the CoSP that have recorded more than three crashes in the last five years is shown in Table 3-1. The highest number of recorded crashes in recent years has occurred along South Perth Esplanade, which caters not only for high volumes of recreational cyclists, but also a wide range of path users which introduces potential conflicts. High numbers of recorded crashes have generally been recorded on roads with high traffic volumes which are often the more direct travel routes to destinations. This accentuates the fact that cyclists use these direct routes to commute and that these roads are dominated by high traffic volumes and therefore there is an increased probability of conflict, particularly at intersections where bicycles often have limited priority. These roads represent the high priority locations for funding directed towards crash investigation and safety improvement works.

Other notable statistics include:

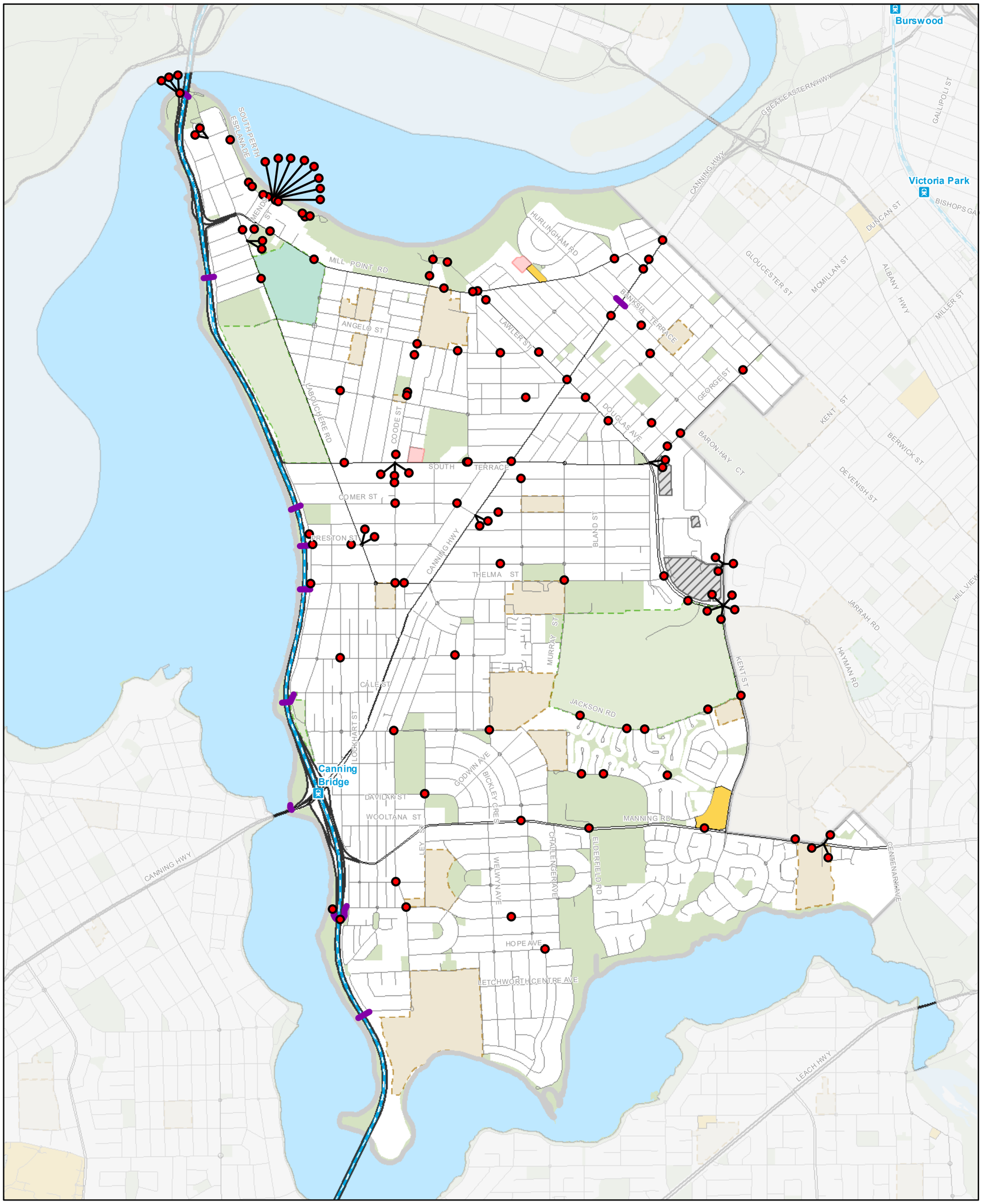
- 15% of all crashes occurred at driveways, where vehicles enter or exit a driveway and collide with a cyclist in the lane or on the path; and
- 11% of recorded bicycle crashes occurred on off-road paths.

The crash statistics have been used to influence and prioritise the recommended projects outlined in Section 8.

Table 4-1: Locations with the highest number of crashes involving cyclists

Crash Locations (roads with 5 crashes or more)		
Location	**Number of Crashes**	**Severity**
South Perth Esplanade	18	6 x Hospitalised
		2 x Medical Attention but not Hospitalised
		1 x PDO Major
		9 x PDO Minor
Douglas Avenue	14	1 x Hospitalised
		4 x Medical Attention but not Hospitalised
		4 x PDO Major
		5 x PDO Minor
Coode Street	13	2 x Hospitalised
		2 x Medical Attention but not Hospitalised
		2 x PDO Major
		7 x PDO Minor
South Terrace	9	1 x Hospitalised
		1 x Medical Attention but not Hospitalised
		1 x PDO Major
		6 x PDO Minor
Mill Point Road	8	3 x Hospitalised
		1 x PDO Major
		4 x PDO Minor
Kent Street	8	1 x Hospitalised
		4 x Medical Attention but not Hospitalised
		3 x PDO Minor
Manning Road	7	2 x Medical Attention but not Hospitalised
		1 x PDO Major
		4 x PDO Minor
Canning Highway	7	1 x Hospitalised
		1 x Medical Attention but not Hospitalised
		3 x PDO Minor
		2 x PDO Major
Labouchere Road	6	2 x Hospitalised
		1 x Medical Attention but not Hospitalised
		1 x PDO Major
		2 x PDO Minor
Jackson Road	5	1 x Hospitalised
		2 x Medical Attention but not Hospitalised
		1 x PDO Minor
		1 x Fatality
George Street	5	1 x Hospitalised
		4 x PDO Minor

*Note that a crash severity of 'PDO' refers to 'property damage only'



Legend

- Crash Location
- Rail Stop
- Railway
- Freeway
- Highway
- Main
- Minor

Overpass/Underpass
- Existing Overpass/Underpass
- LGA Boundary (City of South Perth)

- Shopping Area
- Community Facility
- Hospital Facility
- Education Facility
- Recreational Facility
- Recreational Park or Reserve
- Reserve (Miscellaneous & Other)

0 1 2 km

CoSP Figure 4-3 Crash Locations Involving Cyclists in the CoSP

Revision: 1	Project No: 255909	Date: May 2018
Prepared: S.Richards	Checked: M.LaGalia	Approved: M.LaGalia
Coordinate System: GDA 1994 MGA Zone 50		Scale @ A3: 1:25,000

Source: © Landgate 2017, OpenStreetMap

File: \\aurecon.info\shares\AUPER\Projects\255909 - Joint Bike Plan CoSP & ToVP - CoSP Folder\3.0 Project Delivery\GIS\ArcGIS\l0012_255909_A3P_CoSP_CrashData_Rev1

Client: Town of Victoria Park, City of South Perth

aurecon

5 Stakeholder Consultation

5.1 Community Engagement

As part of the development of the Plan, the local community were invited to provide feedback on their cycling journey with the aim of identifying common routes, existing issues, barriers to cycling, and desired locations to improve or provide additional facilities and infrastructure.

The community were invited to provide feedback through one or all of the following methods:

- Completion of a survey (online or hard copy);
- Input into an online mapping tool; and
- Attendance at a community workshop.

It should be noted that the methods of community engagement were carried out simultaneously between the CoSP and ToVP.

5.1.1 Community Survey

The joint CoSP and ToVP community survey was open to the public from May 1st to June 9th 2017. The survey was completed by a total of 349 participants, with 181 people from the CoSP (62% male, 37% female, 1% other). A graphical summary of the demographics and other results from survey respondents from the CoSP is shown in Appendix A.

In terms of the reasons for cycling, the most common reasons included recreational and exercise (37%), commuting to/from work (20%), to/from shopping (11%) and to/from entertainment locations (11%), noting that respondents could select multiple options. With the scenic cycling route available along the Swan River, recreational cycling is highly popular in the CoSP as reflected in the survey results.

A summary of the most common issues raised from the community survey regarding popular routes can be seen in Table 5-1.

The issues raised in the community survey have been used to influence and prioritise the recommended projects outlined in Section 8.

Table 5-1: Summary of issues raised regarding popular routes

Location	Issue/Concern	% of Comments
Canning Highway	- difficulty in crossing Canning Highway due to high traffic volumes, high traffic speed and lack of safe	10%
	- a desire for dedicated bicycle infrastructure (i.e. bicycle lanes)	
	- high traffic volumes and speeds contribute in creating an intimidating road environment for cyclists	
Swan River Foreshore	- issues with pedestrians using the separated cycle path creates an uncomfortable cycling environment	10%
	- high speed cyclists intimidate recreational cyclists	
	- issues with lack of visibility and priority for cyclists crossing Coode Street puts them in dangerous positions with vehicles and pedestrians	
	- issues with lack of visibility and priority for cyclists crossing Douglas Avenue puts them in dangerous positions with vehicles and pedestrians	
	- a desire for separated cycle paths at McCallum Park and Burswood Park (ToVP)	
	- lack of appropriate lighting at McCallum Park and Burswood Park (ToVP)	
	- issues with sprinklers wetting cyclists during the early morning journeys	
South Perth Esplanade	- high pedestrian volumes, narrow space, obstructions and poor pavement surface of shared path create an uncomfortable cycling environment	7%
	- a desire for dedicated bicycle infrastructure (i.e. bicycle lanes)	
	- a lack of motorist awareness at Mends Street intersection puts cyclists in dangerous positions	
Mill Point Road	- connection to Narrows Bridge creates a pinch point due to design	5%
	- lack of appropriate traffic calming measures increase the probability of conflict between cyclists and other modes of transport	
	- lack of driver awareness contribute in creating an intimidating road environment for cyclists	
	- difficulty in crossing Mill Point Road due to lack of safe crossing points	
Manning Road	- a desire for dedicated bicycle infrastructure (i.e. bicycle lanes)	5%
	- difficulty in crossing Manning Road due to high traffic volumes, high traffic speed and lack of safe	
	- high traffic volumes and speeds contribute in creating an intimidating road environment for cyclists	
Kwinana Freeway PSP	- issues with general maintenance (i.e. leaves, sticks and soil) of path surface creating an uncomfortable cycling environment	5%
	- shared path is too narrow when considering high pedestrian and cyclist volumes creating an uncomfortable cycling environment	
	- issues with lack of lighting, edge lines and bushes affects visibility	
Waterford/Salter Point to PSP	- a desire for dedicated bicycle infrastructure (i.e. shared path) along Canning River Foreshore	5%
	- a desire for dedicated bicycle infrastructure (i.e. bicycle lanes or shared path) through local streets	
Causeway Bridge	- high pedestrian volumes and narrow shared path creating an uncomfortable cycling environment	4%
	- shared path surface is uneven and uncomfortable for cyclists	
Labouchere Road	- issues with vehicles parking in the existing bicycle lanes, and the high traffic speeds create an uncomfortable cycling environment	3%
	- a desire for dedicated bicycle infrastructure (i.e. bicycle lanes) for the remaining stretch north of Angelo Street	
	- difficulty in crossing Labouchere Road due to high traffic volumes, impaired visibility from parked vehicles and lack of safe crossing points	
Douglas Avenue	- lack of appropriate traffic calming measures increase the probability of conflict between cyclists and other modes of transport	3%
	- a desire for dedicated bicycle infrastructure (i.e. bicycle lanes) north of Canning Highway	
	- difficulty in crossing Douglas Avenue due to high traffic volumes and lack of safe crossing points	
Coode St	- lack of appropriate traffic calming measures increase the probability of conflict between cyclists and other modes of transport	2%
	- issues with vehicles parking in the existing bicycle lanes, lack of driver awareness at roundabouts and the high traffic speed creating an uncomfortable cycling environment	
Murray Street	- a desire for dedicated bicycle infrastructure (i.e. bicycle lanes) along the entire route	2%
	- lack of appropriate traffic calming measures increase the probability of conflict between cyclists and other modes of transport	
South Terrace	- lack of appropriate traffic calming measures increase the probability of conflict between cyclists and other modes of transport	2%
	- lack of driver awareness and aggressive driver behaviour contribute in creating an intimidating road environment for cyclists	
	Total	**63%**

5.1.2 Online Mapping Tool

The CoSP interactive online mapping tool was open to the public from May 1st to June 9th 2017. The tool allowed members of the community to place pins on a map of the CoSP to comment on the following items:

- 'Bike Issue' (red pin) – may include locations where there are missing links, unsafe crossings, lights, or other issues relating to the cycling experience;
- 'I enjoy riding here' (green pin) – may include locations that are enjoyable to ride, have great end of trip facilities (i.e. bicycle parking, lockers, showers) or notable for other reasons; and
- 'Bike Idea' (yellow pin) – may include locations that are not necessarily unsafe or an issue, however would like to see an improvement.

Referring to Figure 5-3, a total of 181 pins were dropped on the mapping tool (noting that users could submit an unlimited number of pins). As shown in Figure 5-1 and Figure 5-2, the majority of riders that contributed to the mapping tool were confident cyclists, and for a range of riding purposes. Note that this captures the rider's perception of what the confidence level they see themselves. Future surveys should consider alternative ways to capture the views of riders of lower confidence level, which will assist in initiating greater mode shift towards cycling.

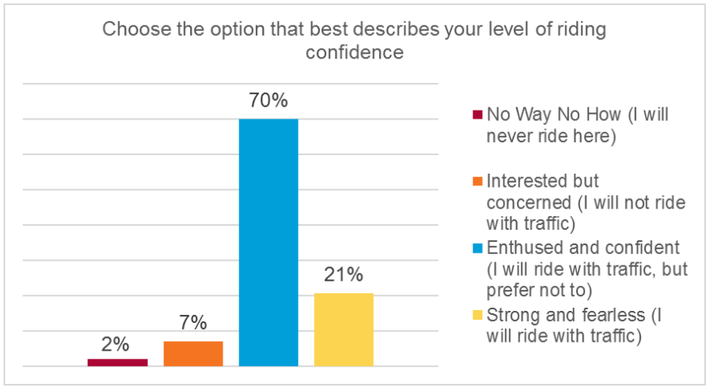


Figure 5-1: Online mapping tool respondents – level of rider confidence

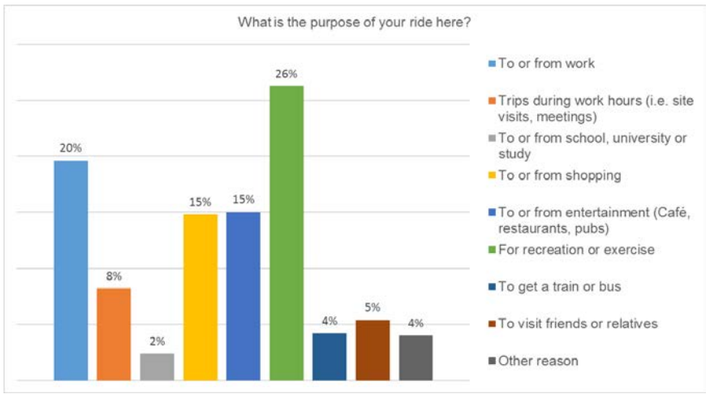


Figure 5-2: Online mapping tool respondents – purpose of ride at pin location

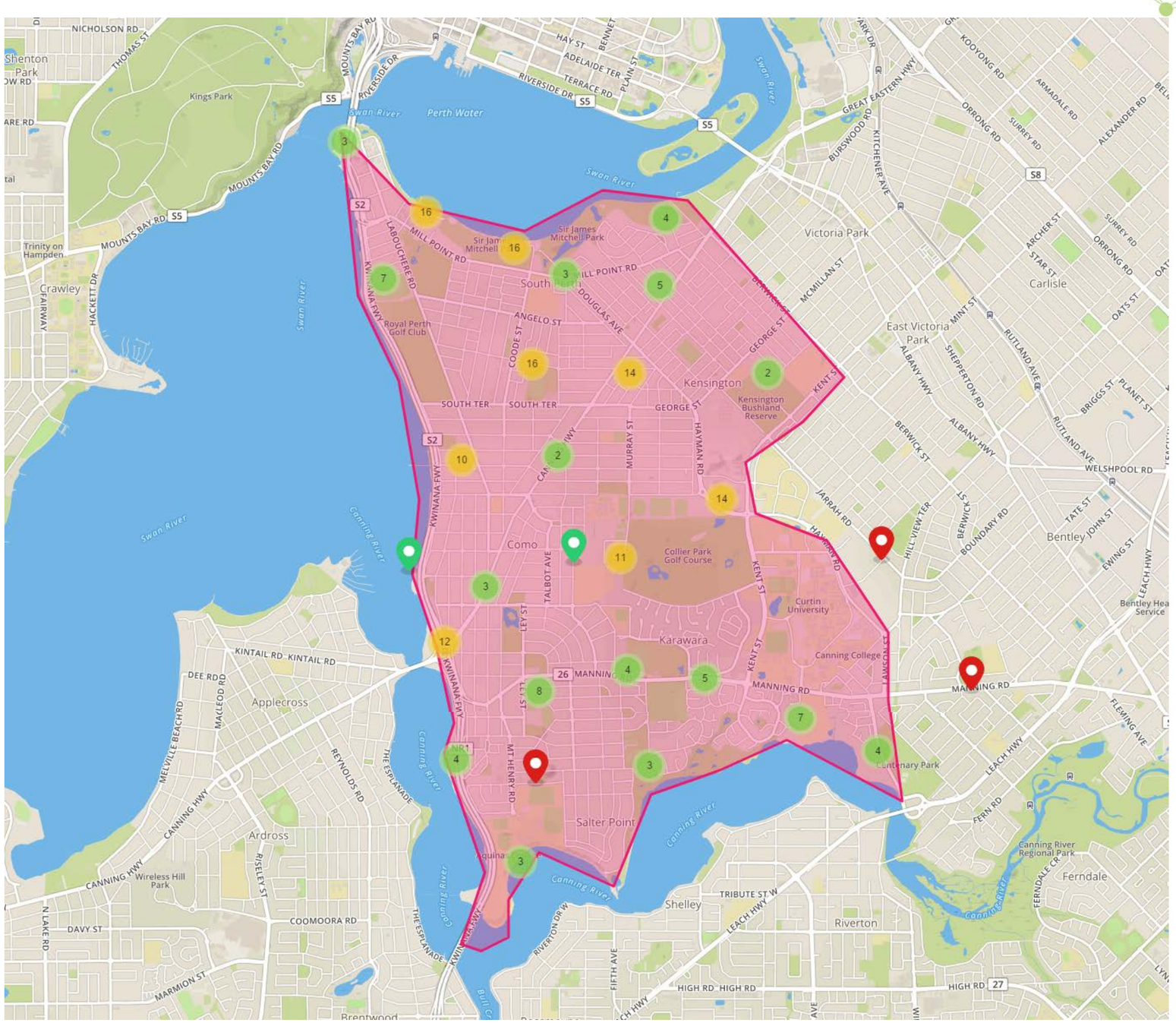


Figure 5-3: CoSP online mapping tool

The following summarises the key feedback provided from the online mapping tool:

Bike Issues (red pins)

1. Vehicles parked on cycle lanes i.e. South Terrace near Royal Perth Golf Club;
2. Roads with high traffic without cycle infrastructure, including at intersections i.e. Canning Highway;
3. Busy locations without adequate cyclist crossing facilities i.e. at South Perth Foreshore Path carparks, Canning Highway and Manning Road; and
4. Fast cyclists and unaware pedestrians using busy shared paths i.e. South Perth Esplanade.

Bike ideas (yellow pins)

1. Improved cycle infrastructure at intersections i.e. continuation of on-road bike lanes and advanced stop cycling boxes;
2. Increased supply of separated facilities i.e. between pedestrian and cyclists, and cyclists and vehicles;
3. Increased end of trip facilities at key destinations i.e. bike parking at Mends Street, Preston Street and Clontarf Markets, and repair station along foreshore;
4. New cycle friendly crossings i.e. at Curtin University South Entrance; and
5. Improved continuation of paths i.e. Canning River foreshore from Centenary Avenue to Kwinana Freeway.

'I like riding here' (green pins)

1. Cycle infrastructure at intersections i.e. continuation of paths along waterfronts i.e. Swan River and Canning River;
2. Locations with high quality shared paths;
3. Direct cycle routes without interruptions i.e. Kwinana Freeway PSP;
4. Areas where there is separation from pedestrians and vehicles i.e. Sir James Mitchell Park;
5. Areas with high visibility and the sense of security this provides.

The issues raised in the online mapping tool have been used to influence and prioritise the recommended projects outlined in Section 8.

5.1.3 Community Workshop

The CoSP community workshop was held on the 31st May 2017 at the CoSP Community Hall. The community were invited to contribute ideas, report issues, prioritise and suggest improvements. Members of the community who were not able to attend the CoSP workshop were encouraged to attend the ToVP workshop which was facilitated in the same way.

The workshop followed a human centred approach where residents were invited to participate in interactive activities that placed the end user at the centre of the thought process. The aim of each activity was to understand the issues, needs and challenges that the community face regarding cycling. By the end of the evening residents could transform some of the key issues raised into real 3-dimensional solutions. The key issues raised are detailed below.

Infrastructure

- Lack of consideration for cyclists at intersections (i.e cycle lanes through intersections, storage at stop lines and space at roundabouts);
- Insufficient signage for existing under/overpasses (i.e. Banksia Terrace / Canning Highway);
- Required stoppages at low points of terrain require additional effort for journeys;
- Cycle infrastructure located in 'door zone';
- Maintenance required along Kwinana PSP (i.e. clear debris);

Figure 5-4: Intersection concept with the provision of coloured cycle lanes

- Lack of bike lanes on major routes (i.e. Manning Road and Canning Highway);
- The need for connectivity from South Perth foreshore to southern areas (i.e. Manning);
- Difficulty crossing major roads due to insufficient facilities (i.e. Canning Highway);
- Lack of cycle infrastructure at Canning Bridge;
- Lack of connection from Waterford to PSP along Canning River foreshore;
- Insufficient width of shared path and uneven surface along the Causeway; and
- Lack of space for cyclists on Murray Street.

End of Trip Facilities

- Lack of secure bike parking at train stations, particularly Canning Bridge Station;
- Lack of bike parking at major public destinations (i.e. shopping centres, civic buildings, sports grounds) and activity centres (i.e. Mends Street, Preston Street, Angelo Street); and
- Insufficient supply of sheltered parking, and water and repair stations.

Safety

- Lack of cycle infrastructure and high traffic volumes and speeds creates an intimidating road environment (i.e. Canning Highway and Manning Road);
- Narrow paths in busy environments act as barriers to cycling (i.e. Causeway Bridge); and
- Lack of separation of cyclists and pedestrians leads to conflicts (i.e. South Perth Esplanade and McCallum Park shared paths).

Youth Safety and Behaviour Change

- Increased focus on initiatives that encourage young cyclists;
- Lack of youth orientated cycle facilities (i.e. pump tracks); and
- The need for cycle paths and cycles zones that separate school children from traffic.

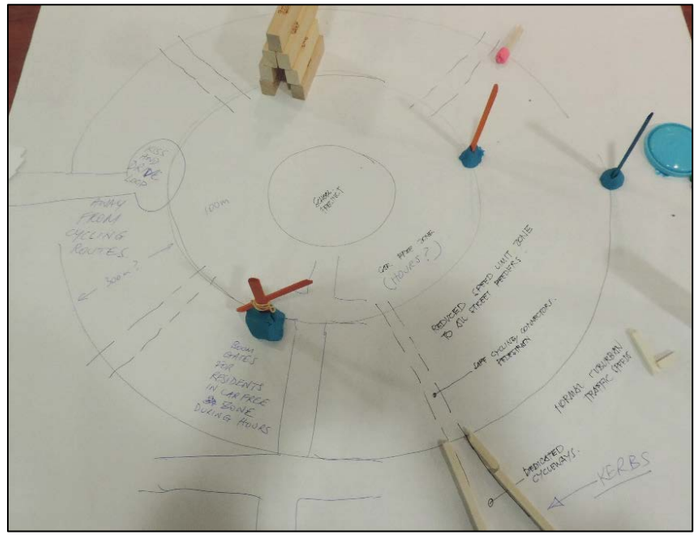


Figure 5-5: School 'Safe Zone' concept constructed during the workshop

A summary of the conversation capture from the workshop can be found in Appendix A.

In addition to the input received during the workshop, a number of individual submissions were provided by attendees. The key ideas from these submissions are detailed below:

- Manning Road off-road cycle facilities are mostly inadequate, and there are no on-road facilities;
- Burswood Park path requires separation between cyclists and pedestrians;
- Champions of cycling are crucial for advancing cycle infrastructure and travel behaviours. These people need to be internal to the key organisations in the area i.e. Council and Curtin University;
- Consideration of best practice will ensure the best possible cycle facilities are installed; and
- A children's bicycle training track was proposed by a local community group. This would help introduce cycling to the young generation and allow them to improve their cycling skills in a safe vehicle-free environment.

The issues raised in the community workshop have been used to influence and prioritise the recommended projects outlined in Section 8.

6 Bicycle Network and Facilities

6.1 Existing Infrastructure Audit

A number of cycle routes traverse the CoSP, many of which have been developed over time through the implementation of the 1996 Perth Bicycle Network Plan and WA Bicycle Network Plan (DoT, 2014-2031). The existing network exists of various types of bicycle infrastructure, including off-road separated and shared paths and on-road cycle lanes. A map of the existing bicycle facilities in the CoSP is shown in Figure 6-1.

In the development of this Plan, the existing bicycle routes have been re-evaluated in light of the State Government's Perth Transport Plan at 3.5 million. As such, an assessment of the existing bicycle network was undertaken with consideration of the routes identified in the Perth Transport Plan at 3.5 million.

The study area was divided into 'links' – a small or complete section of cycle path, on-road facility or roadway. A total of 20 links were assessed on a saddle survey throughout the CoSP.

The assessment of each link was undertaken using the criteria outlined in the Transport Research Laboratory (TRL) Street Audit Network software package (Cycling Component - CERS), as shown in in Table 6-1.

Table 6-1: CERS assessment parameters

Category	Parameters
Convenience	Continuity
	Legibility
	Directness
Accessibility / Safety	Worst Intersection Conflict Point
	Traffic Volume
	Traffic Proximity
	Traffic speed
	Link Conflict Points
Comfort	Effective width
	Surface Quality
	Maintenance
	Overall Effort
Attractiveness	Personal security
	Lighting
	Quality of Environment

6.1.1 Link Rating

The following steps were employed to assess each link.

Step 1 – Identify start and termination point of link

1. Determine individual link lengths of all bicycle routes (this includes the division of routes / corridors);
2. Check each link length logically using data collected on site for suitability; and
3. Assign name and identification reference code for each link.

Step 2 – Check data availability of route

1. Traffic data – Gather from available Main Roads data or estimate based on the road hierarchy and onsite observations. The traffic data available for the audited links is shown in Figure 6-2;
2. Traffic speeds – Note the on-street posted speed limit and determine whether or not the traffic speed on-site is commensurate; and
3. Terrain – From site visits, gather an indication of the terrain (uphill or downhill grade) along the link.

Step 3 – Intersections

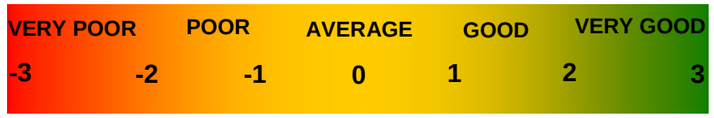
1. Once link length is established, note all types of intersections along the extent of the link; and
2. Highlight the worst performing intersection based on desktop assessment, onsite observation and professional judgement.

Step 4 – On site evaluation

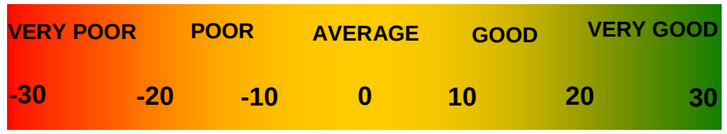
1. Undertake site visits to complete the audit assessment, ensuring all parameter fields are completed (refer to Table 6-2);
2. Where necessary add comments which substantiate scoring decisions or any other relevant information for future reference;
3. Total score for the link will be automatically assigned on completion of all parameters; and
4. Add any relevant conclusions for each link for future reference.

During the assessment of each link, each parameter was manually scored on a range from **-3** to **+3**, where **+3** is the highest score and **-3** the lowest. For a parameter to warrant a score of **+3**, it would need to be exemplary and of a standard identified as best practice. The scores were therefore allocated on a range from very poor to optimum with **0** representing an average score:

The scoring scale is set out below:



An overall score for each link was determined, giving a general indication of how well the route caters for cyclists. Generally, any link that scores above 10 is considered good, a link that receives a score between -10 and 10 is average and a link scoring below -10 is a poor link. The scoring scale for the overall score is shown below:



6.1.2 Audit Findings

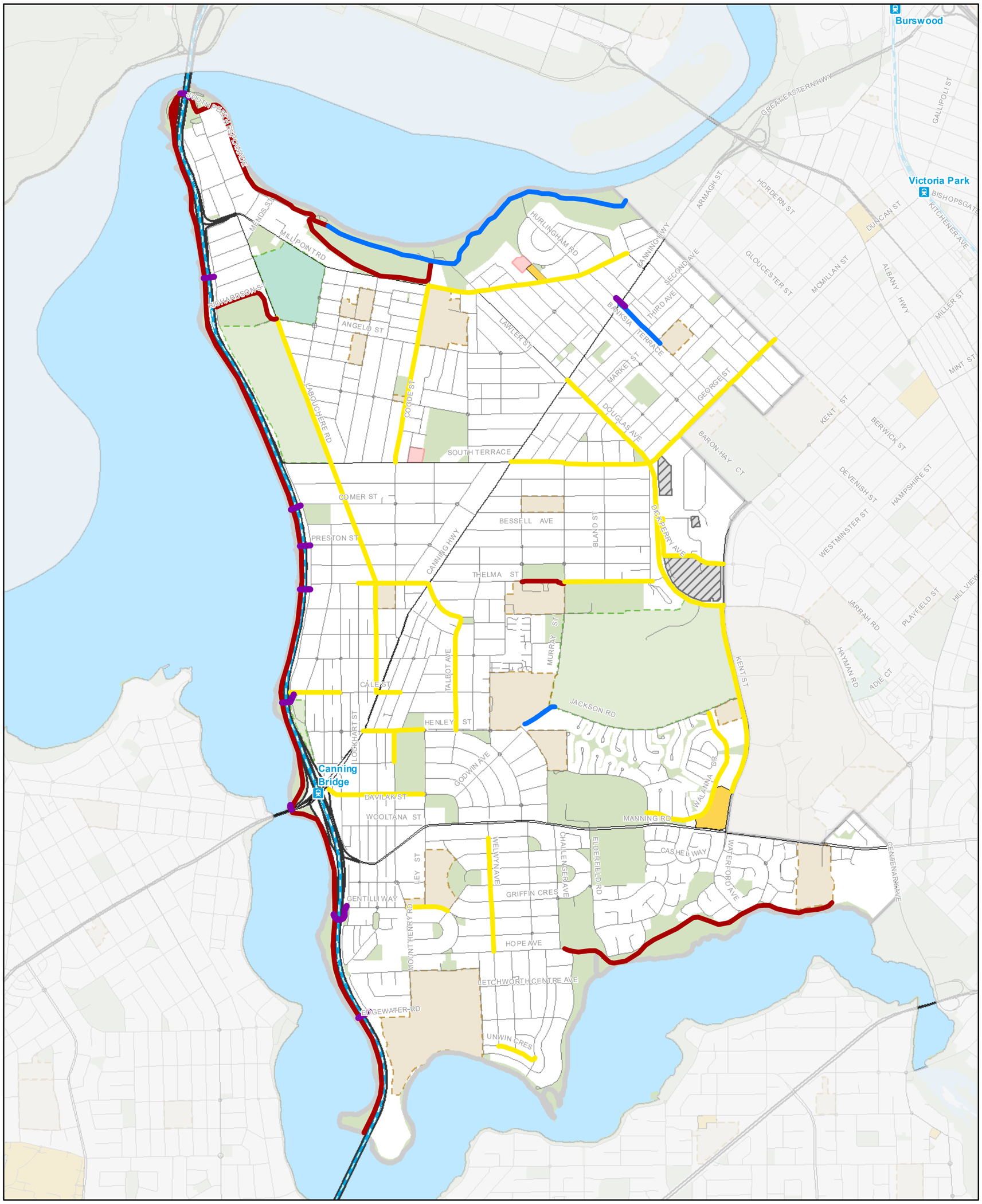
The detailed findings of the infrastructure audit, along with an action plan for each individual link is presented in Appendix B with each link described in terms of:

- Assigned link number;
- Scored colour code;
- Link name;
- Link description;
- Photo inventory;
- Issues identified; and
- Suggestions for improvements.

The suggestions highlighted in the detailed link results in Appendix B are intended to be included in the CoSP maintenance team's work packages for when each specific link is next scheduled for maintenance (unless stated otherwise as a proposed project). It is important to note that there are many cases within the City where existing unsigned sealed shoulders have previously been considered as appropriate for cyclists, however these do not meet the minimum requirements for cycle lanes as defined by the Road Traffic Code and appropriate guidelines. As such, there should be a long term focus on upgrading existing cycle infrastructure in line with the minimum requirements as described in Section 1.3.

The general performance of the audited links is shown in Figure 6-3, where routes with protected cycling infrastructure and low traffic volumes generally outscored those where cyclists are left to mix with high traffic volumes. The scoring performance of each link for each assessment parameter is tabled in Appendix B.

A high level map summary of the proposed recommendations for all the audited infrastructure can also be found in Appendix B ("Infrastructure Audit Summary for CoSP"). The recommendations outlined on this map can be considered when any of the cycle routes are due for resurfacing or opportunities for works in those areas arise.



Legend

- Rail Stop
- Railway
- Freeway
- Highway
- Main
- Minor
- Separated Path (Bikes Only)
- High Quality Shared Path (Bikes and Pedestrians)
- Bicycle Lanes or Sealed Shoulders
- Safe Active Street
- Existing Overpass/Underpass
- LGA Boundary (City of South Perth)
- Shopping Area
- Community Facility
- Hospital Facility
- Education Facility
- Recreational Facility
- Recreational Park or Reserve
- Reserve (Miscellaneous & Other)

0 1 2 km

CoSP Figure 6-1 Existing Bicycle Facilities in the CoSP

Revision: 1	Project No: 255909	Date: May 2018
Prepared: S.Richards	Checked: M.LaGalia	Approved: M.LaGalia
Coordinate System: GDA 1994 MGA Zone 50		Scale @ A3: 1:25,000

Source: © Landgate 2017, OpenStreetMap

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Client: Town of Victoria Park, City of South Perth

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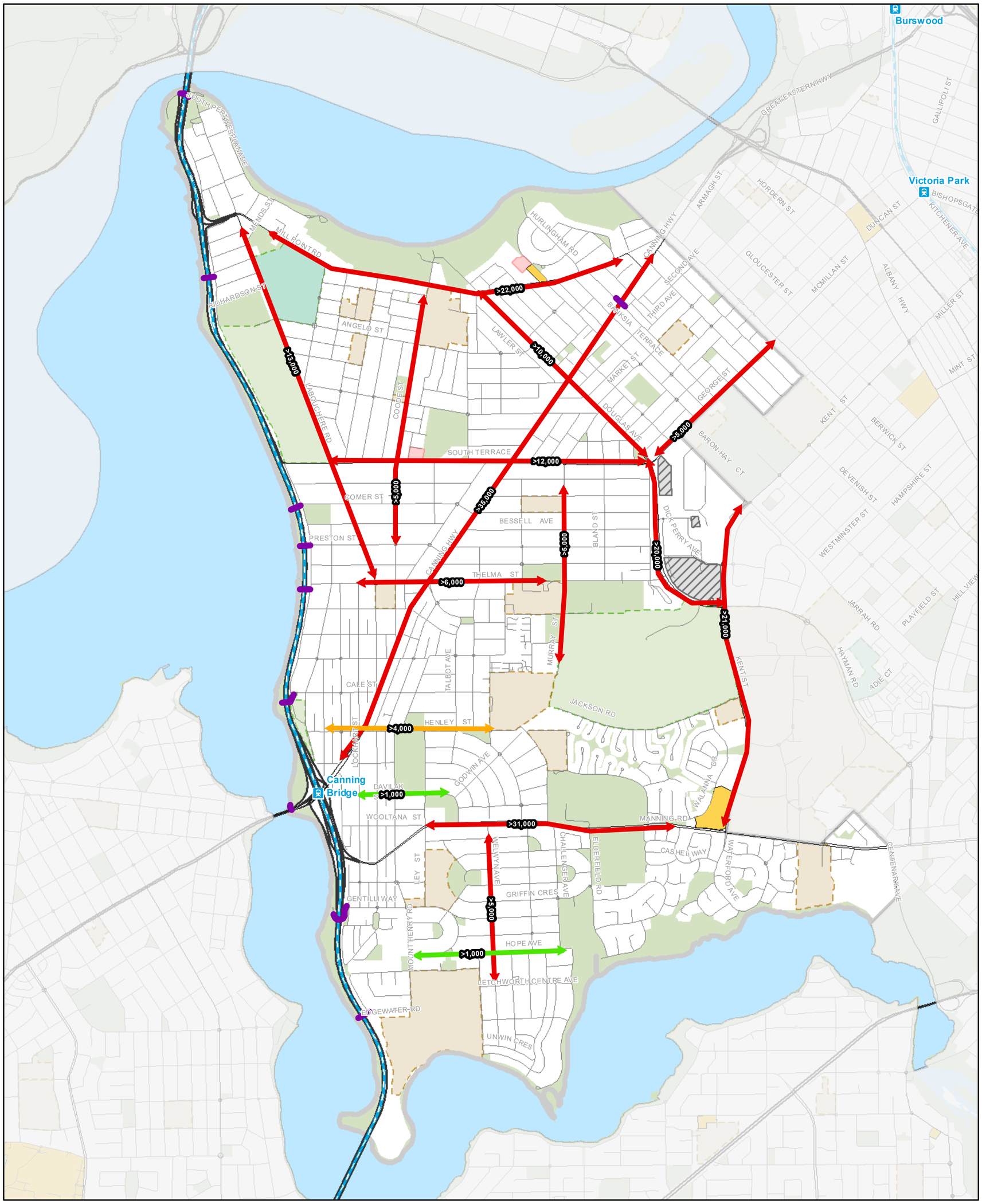
Table 6-2: CERS assessment framework

Category	Parameters	What to assess
Convenience	Continuity	Any issues that may affect the continuity if a facility were to be introduced This could include change in carriageway width, or delay to cyclists (e.g. through signalised intersections)
	Legibility	Issues that may affect a cyclist's ability to follow the route Take note of any existing cycle / traffic signs that provide directions and any landmarks
	Directness	Ascertain if the proposed link is the most direct path with no delays Use site inspections, internet based maps and photography was used to ascertain if there is an alternative route which cyclists could use Take into account intersections or other features that may result in delay
Accessibility / Safety	Worst Intersection Conflict Point	Based on the type of intersection in combination with traffic flow and the size of the intersection Those intersections with fewer potential conflict points are awarded a greater score Ascertained using provided traffic data, collision data and site inspections/ internet based maps
	Traffic Volume	Use existing data for assessment purposes. Those roads with a lighter traffic flows will receive a high score
	Traffic Proximity	Based on mixture of traffic and width of traffic lane(s) in a single direction of travel A wide lane with cars only will provide a higher score than a narrow roadway which routinely accommodates buses or other large vehicles
	Traffic speed	Use recorded 85th percentile speeds or if unavailable posted speed limit signage The lower the speed of vehicular traffic the higher the score
	Link Conflict Points	Includes obstructions along the route carriageway surface Whether visibility is restricted due to roadside furniture, vegetation etc. Considers the presence and frequency of private access points (driveways etc.)
Comfort	Effective width	Assess any existing cycle lane provision Assess the entire width of the carriageway (to include possible effect of overtaking) Make note of parked cars; this will determine what measures may be required to remove parking or whether a cycle lane away from the edge of the carriageway could be introduced
	Surface Quality	Observe quality of road surface and type, i.e. cracking, potholes, cobblestones etc. Observe any skid / fall hazards such as gully gratings, service chamber covers etc. Observe number of reinstatements and quality.
	Maintenance	Assess current drainage facilities and whether drainage channels appear to be free from detritus and regularly swept Identify any areas where ponding of water is evident; large areas of standing water will deter cyclists and alter their path, a particular issue on signed only routes where there is no designated lane Assess quality of road markings to determine clarity – will affect vehicular paths and therefore behaviour through intersections and along routes Provides an indication of the future score of maintenance if not addressed
	Overall Effort	Make note of the gradient of the link to determine the effort cyclists would need to make to negotiate links. Especially problematic if cyclists are required to stop, e.g. at intersections, pedestrian crosswalks, and need to restart
Attractiveness	Personal security	Determine whether the area around the link has litter / graffiti or evidence of vandalism as cycling demand can be suppressed through fear of crime Make a note of the presence of any CCTV cameras in the vicinity Identify any areas of concealment adjacent to the proposed route
	Lighting	Make note of the regularity and positioning of lighting columns to determine the lighting levels during the hours of darkness Lighting should be available on cycle routes as a safety measure and to provide an additional level of personal security
	Quality of Environment	Determine the quality of the property frontages along the link, is this a route that cyclists would want to navigate? Are the frontages and fence lines etc. of good quality and well maintained? The presence of trees / vegetation will make the route more appealing to cyclists. Is regular maintenance likely to occur?



Legend

- Rail Stop
- Railway
- Freeway
- Highway
- Main
- Minor

Overpass/Underpass
- Existing Overpass/Underpass

Existing Traffic Volumes (Vehicles Per Day)
- <2000
- 2000 - 5000
- >5000

- LGA Boundary (City of South Perth)
- Shopping Area
- Community Facility
- Hospital Facility
- Education Facility
- Recreational Facility
- Recreational Park or Reserve
- Reserve (Miscellaneous & Other)

0 1 2 km

CoSP Figure 6-2 Existing Traffic Volumes in the CoSP

Revision: 1	Project No: 255909	Date: May 2018
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Coordinate System: GDA 1994 MGA Zone 50		Scale @ A3: 1:25,000

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Client: Town of Victoria Park, City of South Perth

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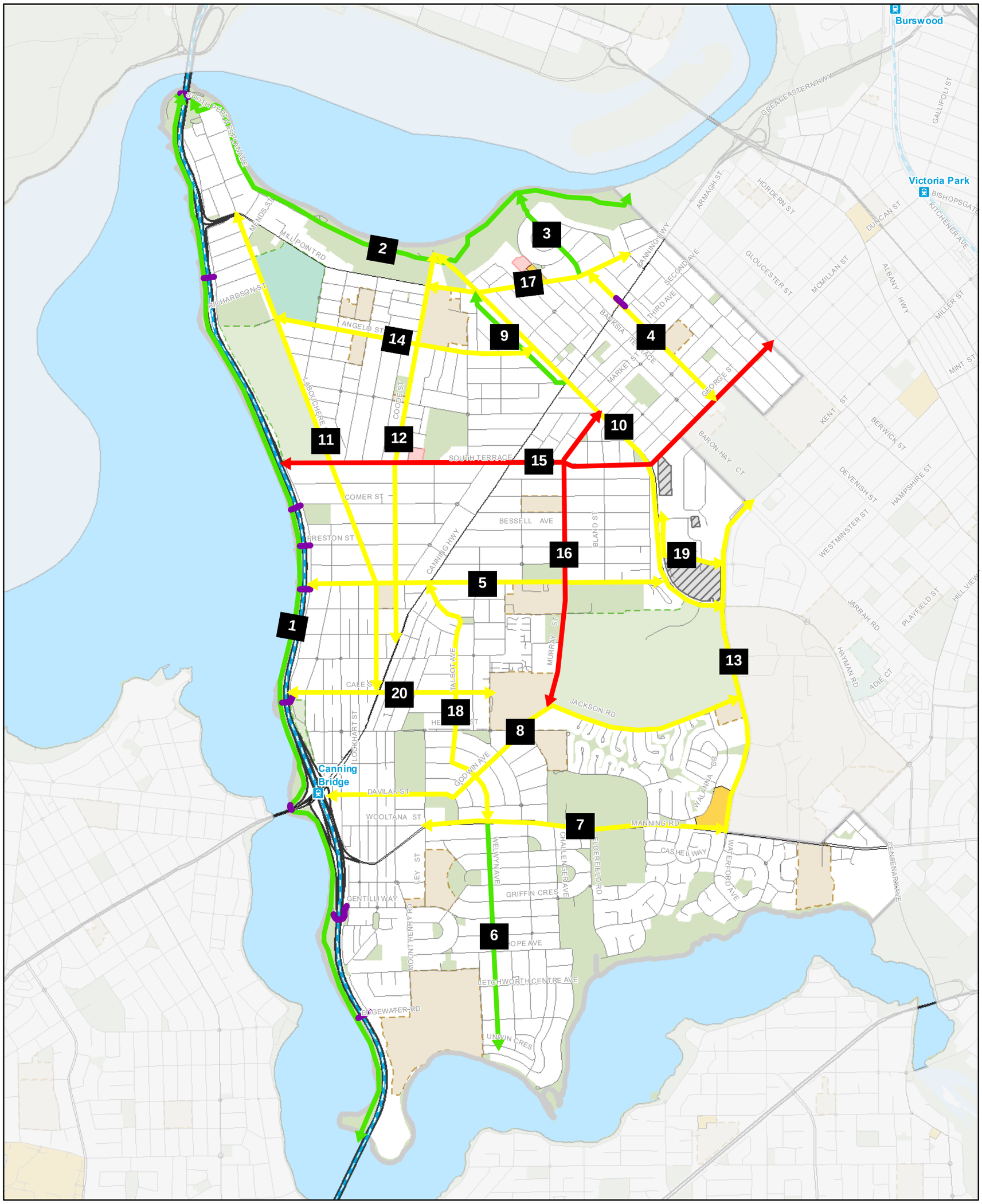

Legend

- Rail Stop
- Railway
- Freeway
- Highway
- Main
- Minor

Audited Links
- Poor
- Good
- Average

Overpass/Underpass
- Existing Overpass/Underpass
- LGA Boundary (City of South Perth)

- Shopping Area
- Community Facility
- Hospital Facility
- Education Facility
- Recreational Facility
- Recreational Park or Reserve
- Reserve (Miscellaneous & Other)

0 1 2 km

CoSP Figure 6-3 Audited Links and Corresponding Performance for the CoSP

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Coordinate System: GDA 1994 MGA Zone 50		Scale @ A3: 1:25,000

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Client: Town of Victoria Park, City of South Perth

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7 Aspirational Cycle Network

It is suggested that the CoSP bicycle network consist of a range of routes that traverse the City and provide access to various land uses. The routes should range from many local routes to fewer primary and secondary routes aimed at providing efficient through movement for commuter cyclists.

The cycle network should be in line with DoT's hierarchy as part of the Perth Transport Plan @3.5million and wherever possible CoSP should be actively involved in influencing the strategy as it pertains to South Perth. It should further be considered that the transport network needs of cyclists, with a destination in mind, are exactly the same as motorists travelling to a destination. This includes the need to include direct and efficient routes, and for this reason the network is similar to the general traffic network.

The overall cycle network is shown in Figure 7-2, and is intended to be **aspirational**– i.e. the long term vision of what the cycle network within the CoSP endeavours to look like by the time Perth's population grows to 3.5 million (towards the year 2050). The proposed aspirational cycle network outlines several ambitious routes aimed at making cycling a realistic and appealing option for a high proportion of the population. The aspirational cycle network has been influenced by the routes identified in the Perth Transport Plan for 3.5 million and the research, investigation and consultation undertaken as part of the project.

The proposed network is based on the DoT cycling route hierarchy, which comprises of three tiers – Primary Routes, Secondary Routes and Local Routes.

7.1.1 Primary Routes

Primary Routes typically consist of high quality shared paths that are located along major road and rail corridors and ocean and river foreshores. Principle routes aim to avoid interruptions to cyclists with consideration to separation of pedestrians and cyclists at areas of high pedestrian activity, and grade separation at major intersecting roads and railways.

It is proposed that these Primary Routes include:

- Kwinana Freeway; and
- South Perth Foreshore

Demand on these routes is high for a wide range of users, and therefore separation of pedestrians and cyclists should be considered.

7.1.2 Secondary Routes

Secondary Routes are typically located on corridors situated within urban or built-up environments. Secondary Routes provide safe and direct connections between Primary Routes and major trip generators such as shopping centres, industrial areas, major health and educational institutions, sporting and civic facilities. Secondary routes can take the following forms:

- Fully protected on-road bicycle lanes;
- On-road bicycle lanes separated from traffic with "soft" measures such as painted hatching, plastic kerbing or armadillos;
- Shared paths within verges to allow access to shops and businesses; and
- Occasionally a Safe Active Street environment may be appropriate.

It is proposed that these Secondary Routes include:

- Labouchere Road;
- Coode Street;
- Lawler Street/Douglas Avenue/Hayman Road;
- South Terrace/George Street;
- Kent Street/Waterford Avenue;
- Thelma Street;
- Mill Point Road (east of Coode Street);
- Davilak Street/Davilak Crescent/Godwin Avenue/Jackson Road;
- Barker Street/Talbot Avenue/Bickley Crescent/Welwyn Avenue;
- Manning Road;
- Parts of the Canning River Foreshore and
- Hope Avenue or Letchworth Centre Avenue.

7.1.3 Local Routes

Local Routes are typically located in local areas (i.e. residential). The purpose of local routes is to collect cycling traffic from local roads within towns and suburbs and distribute it to the secondary and primary networks. Local routes can take the following forms:

- 30km/hr Safe Active Streets which adopt "self-explaining street" and "filtered permeability" urban design principles;
- Very quiet suburban streets, communicated using sharrows or appropriate signage/way finding;
- Short sections of shared path; and
- Occasionally, on road cycle lanes on quiet roads (less than 50km/h) may be appropriate.

It is proposed that these Local Routes include:

- Mends Street;
- Charles Street;
- Angelo Street;
- Hurlingham Road;
- Banksia Terrace;
- Vista Street/View Street;
- Fourth Avenue;
- Comer Street;
- Waverley Street/Alien Street/Pilgram Street;
- Bland Street;
- Dick Perry Avenue;
- Preston Street;
- Cale Street;
- Murray Street (south of Thelma Street);
- Lockhart Street;
- Wooltana Street;
- Henley Street;
- Ley Street;
- Challenger Avenue;
- Elderfield Street;
- Goss Avenue;
- Parts of the Canning River Foreshore; and
- Gentilli Avenue/Cloister Avenue/Duckett Avenue/Griffin Crescent/Carlow Circle/Cashel Way.

Figure 7-1: Route hierarchy example infrastructure (source: DoT)

It should be noted that the DoT Hierarchy also includes Long Distance Trails and Training Circuits, although these are not applicable to CoSP.

Proposed cycle connection along the river foreshore. Note this area forms part of the Clontarf-Waterford-Salter Point Foreshore Masterplan area currently being developed.

Potential future connection to the principal route along the Kwinana Freeway to be investigated further.

Legend

- Rail Stop
- Railway
- Freeway
- Highway
- Main
- Minor

Aspirational Network
- Principal Route
- Principal Route - by others
- Strategic Routes
- Strategic Routes - by others
- Local Routes
- Local Routes - by others
- Proposed Cycle Connection
- Potential Future Connection
- Within Curtin University

Overpass/Underpass
- Existing Overpass/Underpass
- Proposed Overpass/Underpass
- LGA Boundary (City of South Perth)

- Shopping Area
- Community Facility
- Hospital Facility
- Education Facility
- Recreational Facility
- Recreational Park or Reserve
- Reserve (Miscellaneous & Other)

0 1 2 km

WESTERN AUSTRALIA
PERTH

CoSP Figure 7-2 Aspirational Cycle Network for the CoSP

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Client: Town of Victoria Park, City of South Perth

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8 Projects and Prioritisation

8.1 Projects and Prioritisation Process

As a result of the research, investigation and consultation undertaken as part of the project, several potential infrastructure projects were identified and shortlisted for inclusion in the **5-year implementation plan**.

A process was then undertaken to provide an indication of the priority with which the CoSP should aim to implement the infrastructure projects. It should be noted that the prioritisation process is subjective and is intended to provide guidance only. Opportunities may arise over the implementation of this Plan which may fast track or hinder the progress of projects.

Prioritisation of Bicycle Infrastructure Proposals, published by the Australian Bicycle Council and the federal Department of Infrastructure, Transport, Regional Development and Local Government, provides guidance on the prioritisation of bicycle facilities. It also suggests a list of criteria for assessing proposed bicycle facilities. These are listed in the form of six objectives which are outlined below:

1. **Public Consultation**

   Consideration of stakeholder concerns and the impact that the project may have on alleviating issues.

2. **Strategic**

   Consideration of how the project fits into the long term aspirational cycle network.

3. **Connectivity**

   Consideration of how the project may impact accessibility to the following destinations and facilities:

   a. Schools;

   b. Tertiary institutions;

   c. Recreational and tourism facilities;

   d. Employment zones; and

   e. Public transport hubs.

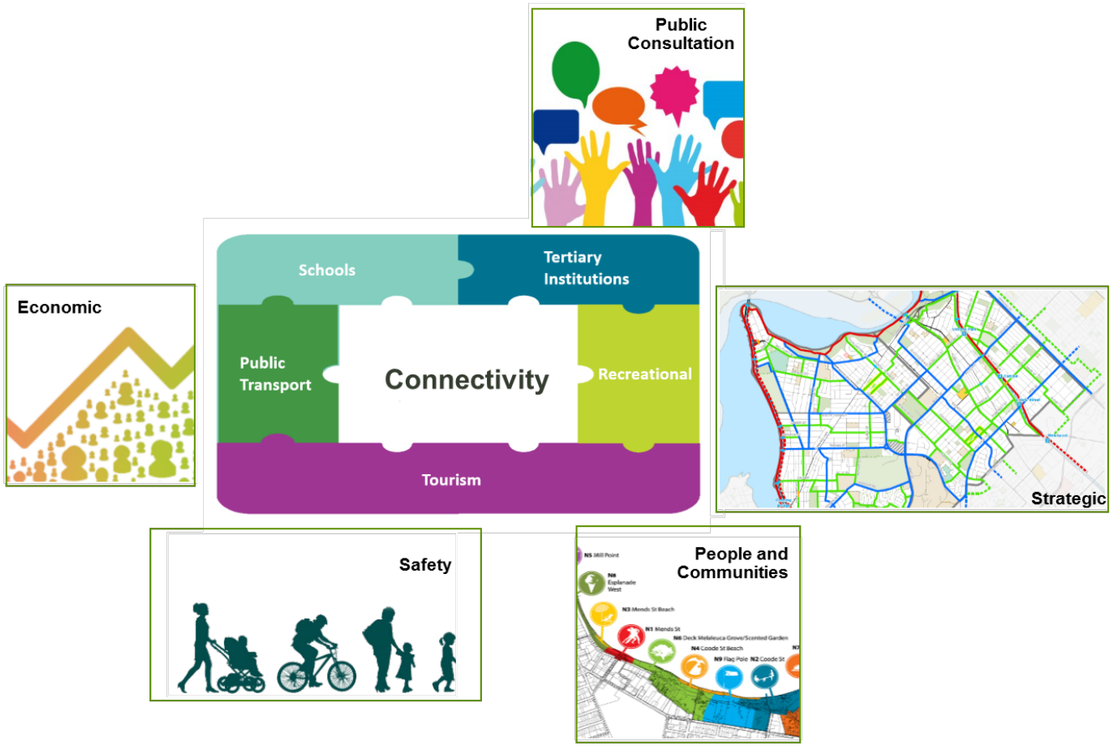
4. **Economic**

   Consideration of how the project may impact the following:

   a. Mode shift – refers to the potential to encourage mode shift away from the private vehicle;

   b. Impact on motor vehicles – refers to the potential impact on private vehicle trips (i.e. journey times); and

   c. Impact on accessibility to commercial facilities.



5. **Safety**

   Consideration of how the project impacts general safety of the following users:

   a. Cyclists; and

   b. Pedestrians.

6. **People and Communities**

   Consideration of the how the project impacts the following:

   a. Level of service – refers to the quality or 'bicycle friendliness' of the route, including factors such as coherence, comfort and convenience; and

   b. Townscape/urban planning – refers to how the proposed project fits into an overall town plan.

Prioritisation of Bicycle Infrastructure Proposals further suggests that the above criteria be used as part of a multi-criteria analysis (MCA). Therefore, in order to prioritise the proposed infrastructure projects, the broad qualitative impact of each proposal was identified under each of the above six objectives.

A score was then assigned for each objective for each project, with the following weightings applied:

- Public Consultation: 20%
  - For the purpose of this study, the total number of comments from both the community survey and the stakeholder consultation were counted, and then grouped into a range for assessment.
- Strategic: 25%
- Connectivity: 25%
- Economic: 5%
- Safety: 15%
  - This criterion takes into consideration the number of crashes that occurred on the proposed route.
- People and communities: 10%

The sum of these individual scores yielded a total score for each proposal out of 10. The priority level of each proposal was then assigned using the total score, as follows:

- 7.0 -10.0: high priority
- 5.0 – 6.99: medium priority
- ≤ 5.0: low priority

8.2 Infrastructure Project List

A total of seven cycling infrastructure projects are proposed within the CoSP over the next 5-years. High level order of cost estimates have been determined for these projects (further details in Section 9), however further investigation will need to be undertaken to develop detailed concepts and understand the true cost of each project. Funding assistance from other agencies, such as the DoT, will need to be explored during implementation of the Plan.

The detailed project sheets for the CoSP, including project justification, prioritisation ratings and indicative costs are provided in Appendix C.

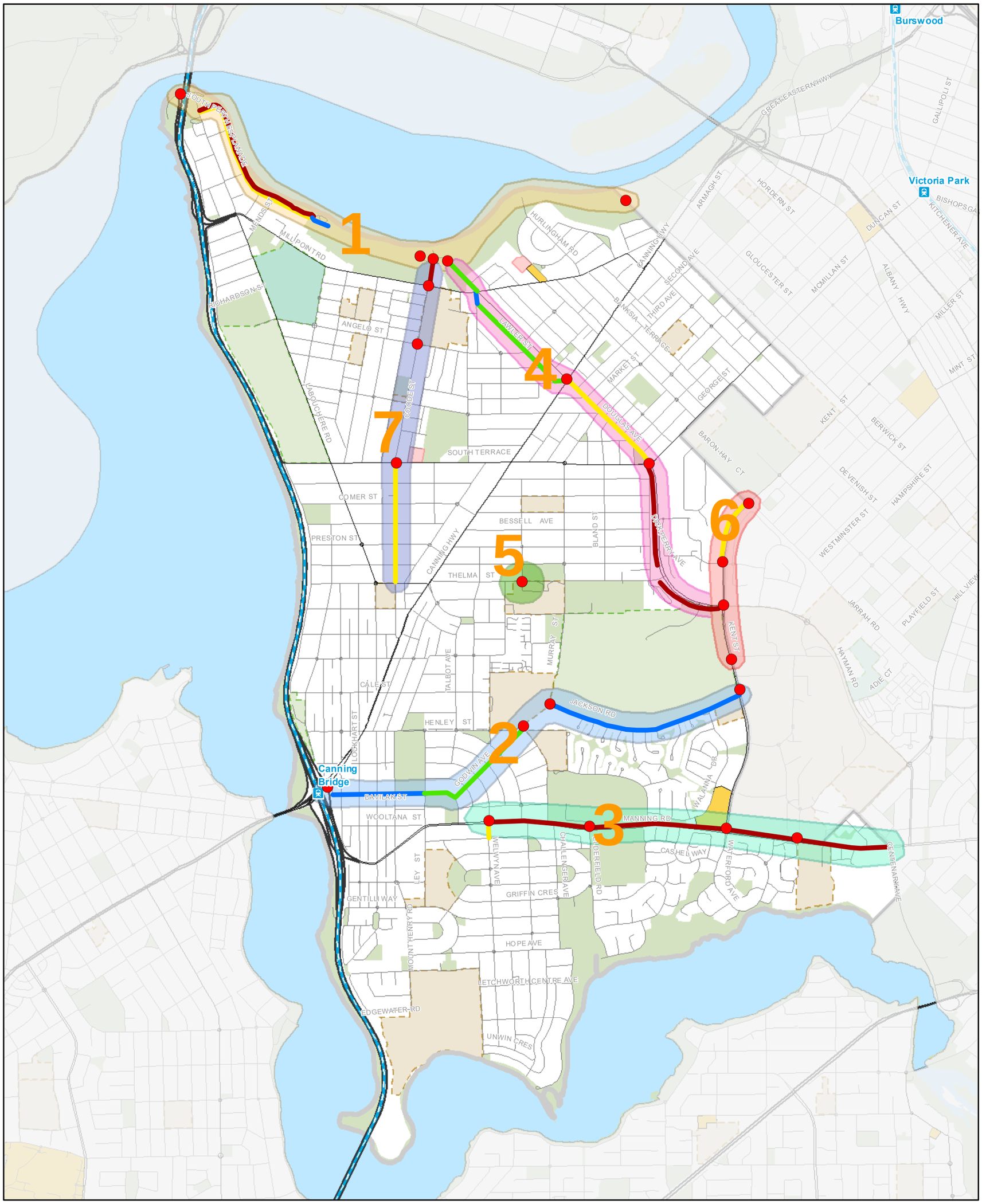
A description of the CoSP prioritised project list is provided in this section, and shown in Figure 8-1. The implementation of these projects will be dependent on further investigation and community consultation.

In line with CoSP's sustainability strategies, where vegetation is required to be removed, it is recommended that this be replaced. As an example, some vegetation can affect sight lines, which could be replaced with the appropriate plant species or ground vegetation.

Table 8-1: Summary of prioritised infrastructure project list for the CoSP

#	Project Name	Location	Description	Public Consultation	Strategic	Connectivity	Economic	Safety	People & Communities	Weighted Total / 10	Estimated Cost*
1	South Perth Esplanade	Between Kwinana Freeway Off-Ramp / Mill Point Road intersection and Ellam Street	This project includes various improvements along the South Perth Foreshore and is divided into several components. The key component of the proposed project involves new and upgraded cycle infrastructure along South Perth Esplanade, either in the form of on-road cycle lanes and wide shared path or development of the route into a safe active street. Additional improvements include modifications at the shared path intersection with the Kwinana Freeway Off-Ramp and the foreshore path crossing points at Coode Street, Douglas Avenue and Ellam Street to provide improved safety and priority for cyclists.	8	10	6.4	6.0	10	10	**8.50**	$1,500,000.00
2	Canning Bridge to Curtin Link	Between Canning Bridge to Kent Street	This project provides a connection between Curtin University and Canning Bridge and is divided into three sections. This includes a proposed separated bi-directional cycle path along Davilak Street, a safe active street/bicycle boulevard along Davilak Crescent and Godwin Avenue and a separated bi-directional cycle path along Jackson Road.	4	8	9.8	4.3	10	10	**7.97**	$1,800,000.00
3	Manning Road Project	Between Welwyn Avenue and Centenary Avenue	This project includes a number of modifications to provide a complete cycling connection along Manning Road. This includes installing a new shared path between Elderfield Road and Kent Street, and formalising the existing footpath with red paint and pavement markings elsewhere. Cyclist crossing improvements are also proposed at the intersections of Welwyn Avenue, Elderfield Road, Kent Street and the Curtin University South Entrance.	8	8	7.6	6.7	8	8	**7.83**	$600,000.00
4	Douglas Avenue Project	Between South Perth Foreshore and Kent Street	This project provides a connection from the South Perth Foreshore to Curtin University and is split into four sections. This includes the development of Douglas Avenue into a safe active street between the South Perth Foreshore and Mill Point Road, a bi-directional path on Tate Street between Douglas Avenue and Lawler Street, the development of Lawler Street into a safe active street, upgraded on-road cycle lanes on Douglas between Canning Highway and South Terrace/George Street, and an upgraded shared path from South Terrace/George Street to Kent Street.	8	8	7.2	3.3	8	7	**7.47**	$1,500,000.00
5	Thelma Street Investigation	Between Throssell Street and Kent Street	This project aims to strengthen the east-west cycle route along Thelma Street by investigating an improvement to the gap in cyclist connection between the existing shared path and the Thelma Street on-road lanes.	4	8	7.2	4.0	8	8	**6.80**	$30,000.00
6	Kent Street Project	Between Manning Road and Jarrah Road	This project aims to strengthen the overall on-road cyclist connection between Curtin University and the City of Belmont, providing access to key destinations along the route. This includes the installation of on-road protected cycle lanes between Kent Street and Jarrah Road, plus off-road bypass paths at the Jarrah Road, Dick Perry Avenue, Hayman Road, and Curtin Main Street intersections.	4	8	7.4	5.3	7.5	7	**6.74**	$400,000.00
7	Coode Street Project	Between Thelma Street and South Perth Foreshore	This project aims to strengthen the north-south connection from the South Perth Foreshore to Thelma Street by filling a gap in the existing network. This includes installing on-road protected cycle lanes between Thelma Street and South Terrace, off-road bypass paths at the South Terrace and Angelo Street intersections, advanced cycle stop boxes at the Mill Point Road intersection and improving the shared path and on-road environment connecting to the South Perth Foreshore.	4	8	6	4.0	9	8	**6.65**	$500,000.00

*High level order of cost estimates have been determined for these projects, however further investigation will need to be undertaken to develop detailed concepts and understand the true cost of each project



Legend

- Rail Stop
- Railway
- Freeway
- Highway
- Main
- Minor

Prioritised Proposed Projects

- Separated Path (Bikes Only)
- High Quality Shared Path (Bikes and Pedestrians)
- Bicycle Lanes
- Safe Active Street
- LGA Boundary (City of South Perth)

1 CoSP Prioritised Project

- Prioritised Project 1
- Prioritised Project 2
- Prioritised Project 3
- Prioritised Project 4
- Prioritised Project 5
- Prioritised Project 6
- Prioritised Project 7

- Shopping Area
- Community Facility
- Hospital Facility
- Education Facility
- Recreational Facility
- Recreational Park or Reserve
- Reserve (Miscellaneous & Other)

0 1 2 km

CoSP Figure 8-1 Infrastructure Project Locations for the CoSP

Revision: 1	Project No: 255909	Date: May 2018
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Coordinate System: GDA 1994 MGA Zone 50		Scale @ A3: 1:25,000

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Client: Town of Victoria Park, City of South Perth

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1 South Perth Esplanade Project

The proposed recommendations for South Perth Esplanade are divided into sections and outlined below.

8.2.1 Freeway Off-Ramp/Mill Point Road intersection

There are currently poor sight lines for cyclists crossing the intersection, for what is a heavily utilised cycle route. The following is recommended:

- Investigate the installation of traffic calming devices on the off-ramp to slow cyclists down;
- Install a zebra crossing or raised wombat crossing to increase priority for cyclists at this important crossing; and
- Investigate the drainage/leaking issue on shared path under Freeway bridge. This will require liaison with Main Roads.

8.2.2 South Perth Esplanade (between Mill Point Road and beginning of South Perth Foreshore path)

There are several considerations for cycling along this route, including the following:

- There is strong demand along South Perth Esplanade for high speed cyclists who desire separation from other modes and obstructions;
- There is strong pedestrian demand for recreational use along South Perth Esplanade;
- Driver awareness of cyclists is low in the area, particularly for vehicles turning into and out of Mends Street, and when parking along South Perth Esplanade;
- Mends Street is utilised by cyclists and pedestrians as a connection and destination;
- This area has recorded the highest number of cyclist crashes within the CoSP in the last 5 years; and
- Connect South is a $7.5 million major project that is currently underway which aims to enhance and invigorate the Mends Street precinct and foreshore area.

The following options are recommended to be further investigated:

- Option 1:
  - Installation of red asphalt on-road cycle lanes along South Perth Esplanade with appropriate signage and line marking. Green asphalt should be used across intersecting roads; and
  - Upgrade the existing shared path to a 3.5m wide red asphalt path with appropriate signage and line marking.
- Option 2:
  - Develop South Perth Esplanade into a safe active street, which may involve the following:
    - Reducing the posted speed limit to 30km/hr;
    - Formalising on-street parking using line-marking;
    - Installing raised plateaus at intersections; and
    - Enhancing the attractiveness of the street.
  - Upgrade the existing shared path to a 3.5m wide red asphalt path with appropriate signage and line marking; and
  - Note that the existing traffic volumes along this route are approximately 3,000 which is higher than the recommended minimum of 1,500 vehicles per day for a safe active street, and therefore this option should be further discussed with the DoT.

As part of the Connect South Project, Mends Street should be treated carefully. The introduction of a 'shared space' along the high activity area of the Mends Street precinct can be an effective option, particularly in this location where there is high pedestrian activity. The shared space concept involves reducing the posted speed limit to as low as 10km/h and integrating all road users to provide pedestrians and cyclists with movement priority over motor vehicles.

Pedestrians should have the highest priority through this section, however cyclists do need to be considered, particularly given the high cycling numbers travelling in the east-west direction, plus cyclists arriving at the Mends Street precinct as a destination. The confident cyclists should be encouraged to use the road (with slow vehicle speed critical for this) and less confident cyclists can utilise a wide shared path along South Perth Esplanade. The cyclist cross flow through the shared space should clearly articulate how cyclists should navigate through the area from the proposed dedicated shared paths. It is recommended that urban design techniques are considered to communicate to cyclists that they are entering a shared environment and modify their riding behaviour, for example using treatments to physically slow cyclists on the approach and alternative pavement marking/signage such as 'reduce speed'/'shared zone ahead' signage. The City of Perth have recently implemented a new shared path along Roe Street, outside of City West Station where the cyclists cross through a "pedestrian priority zone" (refer to the below images). A similar concept could be considered to minimise cyclist/pedestrian conflict through this area.

Mends Street is a key destination, and as such more bicycle parking should be provided along Mends Street along both sides. Converting parking bays to bicycle parking should be considered (approximately 6 bicycle bays can utilise the space for 1 car bay). Currently up to four bikes can be taken on the ferry service at the Mends Street Jetty, however there should be a dedicated focus in providing more bicycle parking at this destination, as well as a secure bicycle parking facility at the ferry terminal to encourage increased ferry trips. This could be in the form of a bike cage that can be physically locked by the user (i.e. using a padlock), or where the SmartRider card is used. The Public Transport Authority (PTA) could be consulted in this regard. There may be an opportunity to provide bicycle parking facilities in the form of public art to increase the attractiveness and awareness of bicycles using the area.

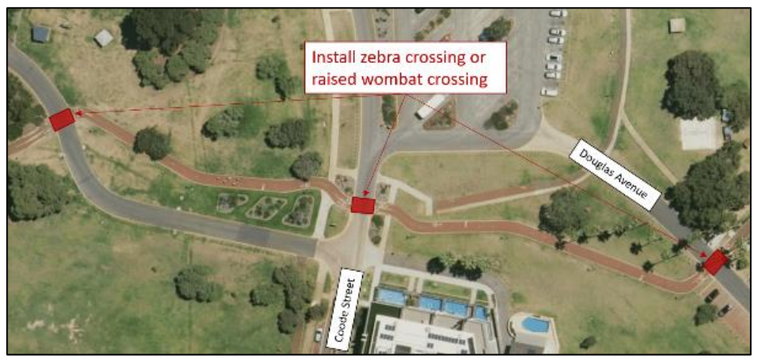
The CoSP should also investigate the installation of an e-bike charging station within the Mends Street precinct, to encourage and cater for the increased use of e-bikes in the future.

8.2.3 South Perth Esplanade Off-Road Paths

The following is recommended at various off-road path crossings along the existing South Perth foreshore cycle path:

- Existing shared path east of South Perth Esplanade and adjacent to playground/picnic area
  - Install new footpath traversing parallel to existing shared path;
  - Install signage and pavement markings along shared path to indicate 'Bicycle Only' use; and
  - This conflict was highlighted in the 2015 South Perth Foreshore Strategy and Management Plan as part of Node 6.

- Address conflict points and provide increased priority for cyclists along the foreshore path by:
  - Installing traffic calming at road intersections to the cycle path to provide increased priority for cyclists i.e. continuous red asphalt, zebra crossings, wombat crossings or raised plateaus (or a combination of treatments).



During the implementation of the South Perth Esplanade project, supplementary initiatives should be incorporated to support behaviour change and encourage cycling. This should include wayfinding signage, bike parking and amenities and awareness campaigns (discussed in Section 8.5).

2 Canning Bridge to Curtin Link

This project formed part of the previous bike plan, forming a cycle link between Canning Bridge Station and Curtin University.

Each segment of the Canning Bridge to Curtin Link is divided into three sections, with the following recommendations:

- Section 2a: Davilak Street (between Canning Bridge and Ley Street)
  - Install bi-directional cycle path on the northern side of Davilak Street; and
  - Investigate the feasibility of decreasing the posted speed limit to 30km/h.
- Section 2b:
  - Davilak Crescent (between Ley Street and Godwin Avenue)
    - Option 1: Develop into a safe active street by reducing to 30km/h, formalising on-street parking and installing pavement marking; or
    - Option 2: Install off-road red asphalt shared path on the southern side of Davilak Street.
  - Godwin Avenue (between Davilak Crescent and Henley Street)
    - Develop into a safe active street by reducing to 30km/h, formalising on-street parking and installing pavement marking. Install raised plateau at Bickley Street (noting that this provides a connection to the secondary north-south cycle route); and
    - Modify connection from Henley Street to the Godwin Avenue path to provide a direct connection cyclists (in line with the Curtin Bicycle Link Master Plan, May 2015).
- Wayfinding is also recommended as part of the route.

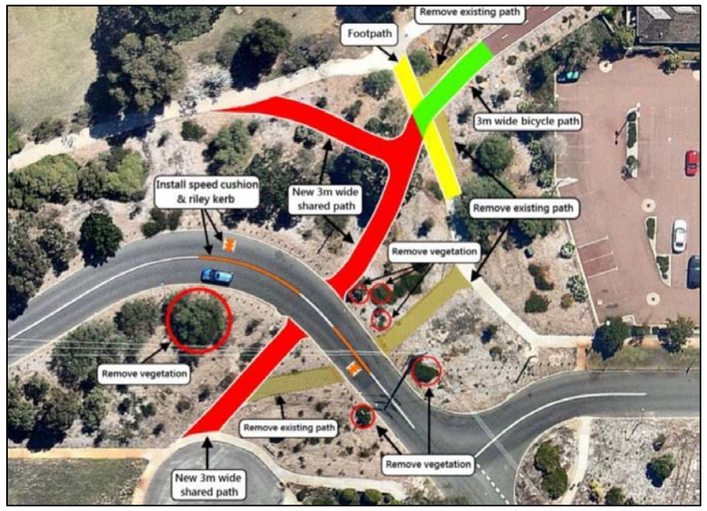


Figure 8-2: Proposed Henley Street path connection (source: Curtin Bicycle Link Master Plan, May 2015)

- Section 2c: Jackson Road (between Henley Street and Kent Street)
  - Replace the existing footpath with two-way bidirectional cycle path along Jackson Road; and
  - Construct new footpath alongside the cycle path, meandering through the existing trees.

During the implementation of the Canning Bridge to Curtin Link project, supplementary initiatives should be incorporated to support behaviour change and encourage cycling. This should include wayfinding signage, bike parking and amenities and awareness campaigns (discussed in Section 8.5). In addition, it is proposed that a bike share scheme is trialled once the project is completed, in liaison with Curtin University and the ToVP (discussed in Section 8.5.5).

3 Manning Road Project

Manning Road provides a direct east-west connection across the southern section of South Perth to Curtin University and neighbouring councils and is proposed as a secondary cycle route. Existing traffic volumes along the road are excessive (approximately 32,000 vehicles per day), the speed limit is high (70km/hr) and Manning Road is a bus route, which creates a hostile environment for on-road cycling. The off-road paths along Manning Road are narrow and inconsistent, however there is great potential for improvements due to minimal driveway crossovers and generous verge space.

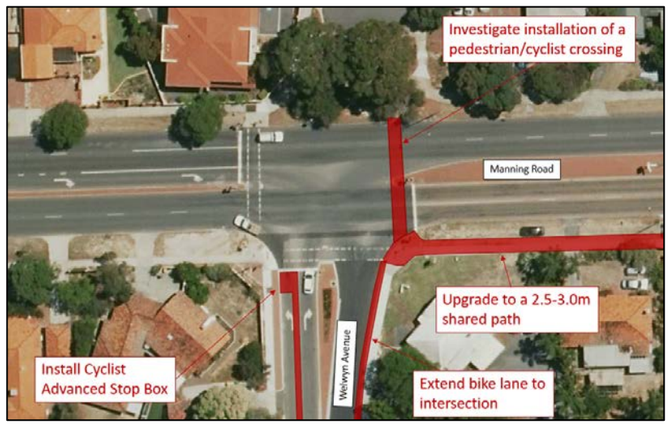
The following modifications are recommended, with further investigation and liaison with adjacent councils required.

- Manning Road (southern side, between Welwyn Avenue and Elderfield Road)
  - Replace existing concrete path with 2.5m-3.0m red asphalt shared path.
- Manning Road/Elderfield Road intersection
  - Upgrade the intersection to include pedestrian/cyclist crossings on all legs, with wide medians and holding rails to cater for cyclists.
- Manning Road (southern side, between Elderfield Road and Marino Place)
  - Install a new 2.5m-3.0m red asphalt shared path, ensuring that the path deviates behind the bus stops where possible; and
  - Investigate the installation of cut-throughs at the various side intersections, including Marino Place, Wexford Court and Fermoy Close.
- Manning Road (southern side, between Marino Place and Kent Street/Waterford Avenue)
  - Replace existing concrete path with 2.5m-3.0m red asphalt shared path.
- Manning Road/Kent Street/Waterford Avenue intersection
  - Install formal pedestrian/cyclist crossings in both east-west directions;
  - Remove existing pram ramps and install cut-throughs;

- Install holding rails at all waiting points at the intersection; and
- Install zebra crossings across the left-turning lanes to improve pedestrian/cyclist priority to cross the intersection.

- Manning Road (southern side, between Kent Street/Waterford Avenue and Centenary Avenue)
  - Spray existing path with red paint and re-install shared path pavement markings (to be done during the installation of the new Manning Road shared path). This will reinforce and make the cycle route consistent and complete.
- Modifications to the Manning Road/Curtin University South entrance signalised intersection:
  - Formalise a pedestrian/cyclist crossing on the eastern side of the intersection. Install a wide median cut-through at the crossing and install holding rails to cater for cyclists; and
  - Install zebra crossings at the existing pedestrian crossings to improve priority for cyclists and pedestrians crossing in the east-west direction.
- Welwyn Avenue/Manning Road intersection
  - Install a cyclist advanced stop box at the Welwyn approach at the intersection to allow cyclists to turn left or continue straight along the secondary route;

  - Investigate the narrowing of traffic lanes on Manning Road at the intersection to widen the median crossing and install holding rails to cater for cyclists;
  - Investigate the installation of a pram ramp and pedestrian/cyclist crossing on the eastern side of the intersection with a wide median crossing and holding rails to cater for cyclists. This will facilitate southbound cyclists accessing the southbound cycle lane, from north of Manning Road. Installing a crossing on the eastern side will provide improved priority and amenity for cyclists, however will have an impact on delay of the Manning Road east-west movement. This will therefore require further investigation and studies; and
  - Extend the southbound on-road bike lane up to Manning Road to guide cyclists into it.



4 Douglas Avenue Project

This project forms a key cycle link between Curtin University and the South Perth Foreshore. Traffic volumes across the route vary, with up to 11,000 vehicles per day along the busiest sections. There is no cycle infrastructure available on Douglas Avenue (between Mill Point Road and Canning Highway) and therefore many cyclists utilise the parallel Lawler Street. Douglas Avenue also recorded the second highest number of crashes involving cyclists in the last five years.

The proposed cycle route involves improved cycle infrastructure spanning across the following road sections:

- **Section 4A:** Douglas Avenue (between South Perth Foreshore and Mill Point Road)
- **Section 4B:** Lawler Street (between Mill Point Road and Canning Highway)
- **Section 4C:** Douglas Avenue (between Canning Highway and South Terrace)
- **Section 4D:** Hayman Road (between South Terrace and Kent Street)

8.2.4 4A – Douglas Avenue (between South Perth Foreshore and Mill Point Road)

This section of Douglas Avenue carries low traffic volumes as it does not provide a direct connection to Mill Point Road. As such, it is proposed that this section is developed into a safe active street in order to provide a convenient connection to the existing cycle path along the South Perth Foreshore. This should involve reducing to 30km/h, formalising on-street parking and installing pavement marking. Lighting along this road should also be reviewed, and wayfinding signage incorporated.

8.2.5 4B – Lawler Street

Lawler Street provides a safe alternative route to Douglas Avenue between Mill Point Road and Canning Highway. Lawler Street carries low traffic volumes and connects (via Tate Street) directly to the signalised crossing at Mill Point Road.

The following modifications are recommended, with further investigation and liaison with the relevant authorities required:

- Lawley Street/Mill Point Road intersection
  - Install a bi-directional cycle path adjacent to the kerb on the eastern side of Tate Street connecting directly from Mill Point Road signalised crossing. Formalise parallel parking on one side of the road in this section, ensuring adequate clearance from the cycle path; and
  - Install raised plateau at Tate Street/Lawley Street intersection with north-south crossing to facilitate northbound cyclists coming from Lawler Street.

- Lawler Street/Elizabeth Street (between Tate Street and Canning Highway)
  - Develop this section into a safe active street by reducing the posted speed limit to 30km/h, formalising on-street parking and installing pavement marking.
- Lawler Street/Angelo Street intersection
  - As part of the development of the safe active street, investigate modifications to the intersection to strengthen the cyclist crossing i.e. converting the intersection to left in, left out.

8.2.6 4C – Douglas Avenue

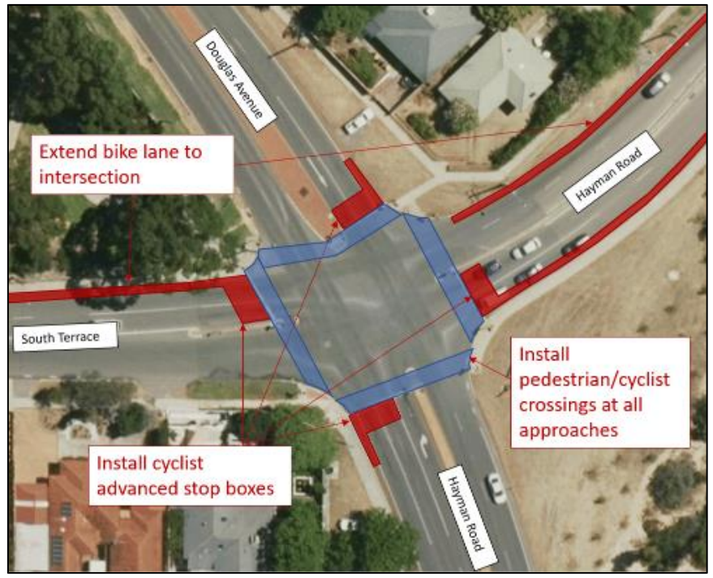
On this section of Douglas Avenue, on-road cycle lanes/ sealed shoulders are currently provided with red asphalt surfacing, however they are not marked as cycle lanes, and are narrow near the South Terrace/ George Street intersection. The on-road cycle lanes do not span the entire length to the Canning Highway intersection, and lack suitable options to enter/exit the roadway. Crossing the intersection of Douglas Avenue/Canning Highway is inconvenient to cyclists, particularly for southbound cyclists using Lawler Street who are required to cross twice with lengthy delay.

The following modifications are recommended, with further investigation and liaison with relevant authorities required:

- Douglas Avenue/Canning Highway
  - It is inconvenient for southbound travelling cyclists to utilise Douglas Avenue from Lawler Street. Investigate improving the north-south connection for cyclists across Canning Highway in collaboration with Main Roads. This could involve modification to the configuration and signal phasing on the Douglas Avenue approaches; and

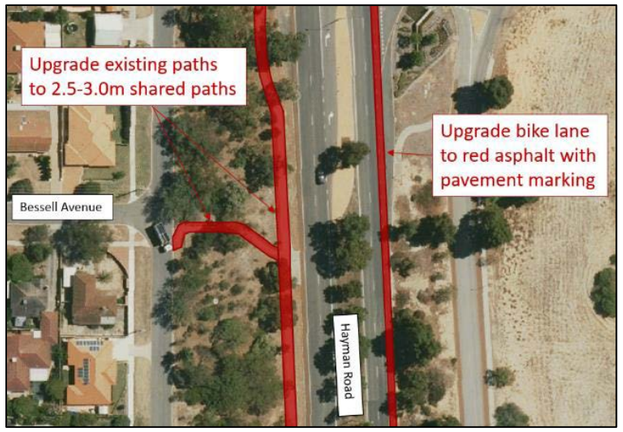
- Investigate the continuation of cycle lanes and an advanced cycling stop box in the northbound direction on the approach to the Canning Highway intersection.

- Douglas Avenue (between Canning Highway and George Street/South Terrace)
  - Currently on-road red asphalt sealed shoulders are provided, however they are not marked as cycle lanes, and are narrow near the South Terrace intersection. The cycle lanes should be 1.5m at a minimum and it is recommended that protection of the lanes is considered. In addition, green asphalt should be used for the cycle lanes across all side intersections. Where possible, the existing traffic lane width should be narrowed to the minimum possible to facilitate a wider cycle lane; and
  - As part of this section, cycle access into the Moresby Street activity strip should be considered, i.e. a new path connection at the Moresby Street/Douglas Avenue intersection.
- Douglas Avenue/Kent Street/George Street/South Terrace intersection
  - This intersection is critical as it connects to key secondary cycle routes.
  - It is recommended that the following modifications are investigated at this intersection:
    - Install formal pedestrian/cyclist crossings on all legs of the intersection and investigate widening of the median crossings to accommodate cyclists. Install holding rails in median crossings on all intersection legs;
    - Continue all on-road cycle lanes through the intersection in all directions and install advanced stop cycle boxes on all approaches (may require narrowing of traffic lanes on the South Terrace and George Street approaches); and
    - In order to accommodate the above, minor realignment of the intersection may be necessary.



8.2.7 4D – Hayman Road

- Hayman Road (western side, between George Street/South Terrace and Thelma Street)
  - Upgrade existing path to a 2.5m-3.0m red asphalt shared path.
- Hayman Road (between George Street/South Terrace and Kent Street)
  - Currently on-road sealed shoulders are provided, however they are not sealed with red asphalt nor marked as cycle lanes. It is recommended that when the next resurfacing works along Hayman Road are undertaken that this entire section of on-road cycle lanes is reviewed. The cycle lanes should be sealed in red asphalt at a minimum width of 1.5m and it is recommended that a hatched road marking is installed to provide a buffer zone to the traffic lane. In addition, green asphalt should be used for the cycle lanes across all side intersections. Where possible, the existing traffic lane width should be narrowed to the minimum possible to facilitate a wider cycle lane. Off-road bypass paths should be installed prior to the bus stops to allow on-road cyclists a safe diversion if a bus is stopped.
- Hayman Road (connection to Bessell Avenue)
  - Upgrade shared path connection to facilitate enhanced access to Bessell Avenue (proposed as a local cycling route).



- Hayman Road/Kent Street intersection
  - Install off-road bypass in east-bound direction on the Hayman Street approach at the Kent Street roundabout

- It is also recommended to investigate the reduction of the speed limit to 60km/h for entire length.

5 Thelma Street Investigation

Thelma Street is an important east-west secondary route throughout the CoSP, providing direct connections between Curtin University, Penrhos College and the Kwinana Freeway principal shared path, as well as providing key connections to perpendicular secondary routes.

The connection with the west end of the Penrhos College carpark and Throssell Street is a challenging location for cyclists travelling east-west to navigate. The existing shared path leads cyclists into the carpark, which increases chances of conflicts with vehicles and pedestrians, particularly during school peak periods.

The following is proposed to be explored to improve connectivity and legibility of cycling infrastructure along this key route.

- Thelma Street (between Throssell Street and Murray Street)
  - Investigation into the cyclist connection between the existing shared path and the Thelma Street on-road lanes
    - This should include liaison with the PTA and Penrhos College to understand whether there are any opportunities to modify the bus drop-off layout and movements; and
    - A potential option is to deviate the shared path around the existing parking lot and tie in to the on-road cycle lanes by:

      - Continuing the shared path along the northern edge of the car park. This could be achieved by reducing the size of the cul-de-sac and car park aisle width;

      - Installing raised plateau to raise motorist awareness and slow vehicle speeds;

      - Installing new cyclist crossing for westbound cyclists; and

      - Install wheel stops in car parking bays to prevent vehicle overhang into the cycle path.

6 Kent Street Project

This project forms a key east-west cycle link between Curtin University, through the Town of Victoria Park towards the City of Belmont.

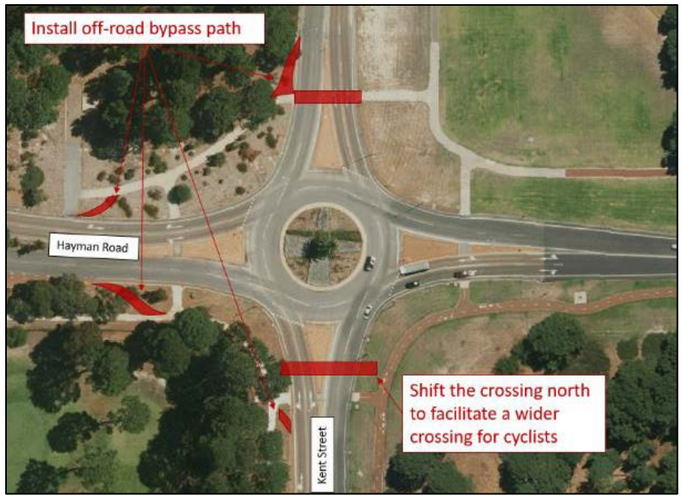
Kent Street is an important secondary route and local route for both less confident and fearless cyclists to access Curtin University. The section is a challenging environment, with Kent Street catering for high traffic volumes, a high frequency bus route and posted speed limit of up to 70km/h.

In addition to the recommendations outlined below, additional improvements to cycle infrastructure along Kent Street are proposed in the ToVP recommendations (due to local government boundaries). Due to the unique nature of Kent Street, all proposed upgrades to Kent Street are recommended to be undertaken jointly by the CoSP and ToVP.

The following modifications are recommended, with further investigation and liaison with the relevant authorities required:

- Kent Street/Curtin Main Street intersection
  - The intersection was recently upgraded, however removes priority for cyclists. It is recommended that an off-road bypass path is provided at the crossing point located just south of the intersection to give on-road cyclists travelling northbound a safe option to enter the Curtin Main Street. Signage should be provided to direct cyclists off the lane to access the Curtin Main Street and holding rails should be installed in the central median.

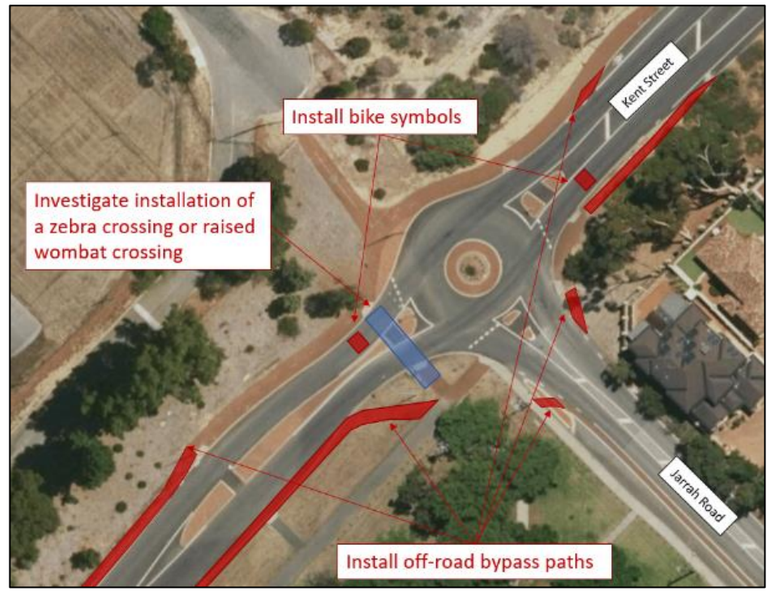
- Kent Street/Hayman Road intersection
  - Install off-road bypasses on Kent Street to provide smooth transitions for northbound on-road cyclists on both sides of the roundabout;
  - Install holding rails on all legs of the intersection; and
  - In collaboration with the ToVP shift the central widen the central median crossing to cater for cyclists (minimum 2.5m) plus holding rails.



- Kent Street (western side, between Dick Perry Avenue/Turner Avenue and Jarrah Road/Baron-Hay Court)
  - Currently narrow, inconsistent sealed shoulders are provided in this section. It is recommended that new 1.5m formal on-road bike lanes with red asphalt and bicycle pavement markings are installed (approximately 400m length). Where possible, the existing traffic lane width should be narrowed to the minimum possible to facilitate a wider cycle lane. Separation in the form of painted line marking should be considered. This should be undertaken in collaboration with the ToVP.
- Kent Street/Dick Perry Avenue/Turner Avenue intersection
  - Install off-road bypasses on Kent Street to provide smooth transitions for northbound on-road cyclists on both sides of the roundabout.

- Kent Street/Jarrah Road/Baron-Hay Court

  In collaboration with the ToVP, the following is recommended:
  - Realign the existing off-road bypass path to provide a smooth transition for on-road cyclists opting to navigate the roundabout;
  - Install holding rails on all approaches to the intersection;
  - Install bicycle pavement symbol in the centre of the approach lane on Kent Street to raise driver awareness for cyclists circulating the roundabout; and
  - This is an important intersection for cyclists, as it also connects to a local cross route. The following improvements are recommended in collaboration with ToVP:
    - Install appropriate off-road bypass paths with smooth transitions for on-road cyclists on all approaches to the roundabout to ensure connectivity. Construct an entry ramp onto the southbound bike lane along Jarrah Road from the south-east corner of intersection; and
    - Consider installing a zebra crossing or raised wombat crossing on the south-western leg of the intersection to assist cyclists in crossing the local route.



7 Coode Street Project

Coode Street provides a north-south direct connection between Como Primary School, Wesley College and the South Perth Foreshore. This route carries traffic volumes generally below 6,000 vehicles per day and the posted speed is 50km/hr.

Existing cycle lanes exist between South Terrace and Mill Point Road, however there are no formal cycle lanes between South Terrace and Thelma Street. The existing on-road bike lanes discontinue at the Mill Point Road, Angelo Street and South Terrace intersections, and there is a lack of suitable safe options to enter/exit the roadway from the cycle lanes at these locations.

The following recommendations are proposed (beginning from the Coode Street/Thelma Street intersection):

- Coode Street (between Thelma Street and South Terrace)

There are no formal cycle lanes, forming a gap in the cycle network.

- Install 1.5m red asphalt on-road cycle lanes;
- Install cycle bypasses around existing median island pinch points; and
- Install off-road bypass paths at the Comer Street and Preston Street roundabouts.

- Coode Street/South Terrace intersection

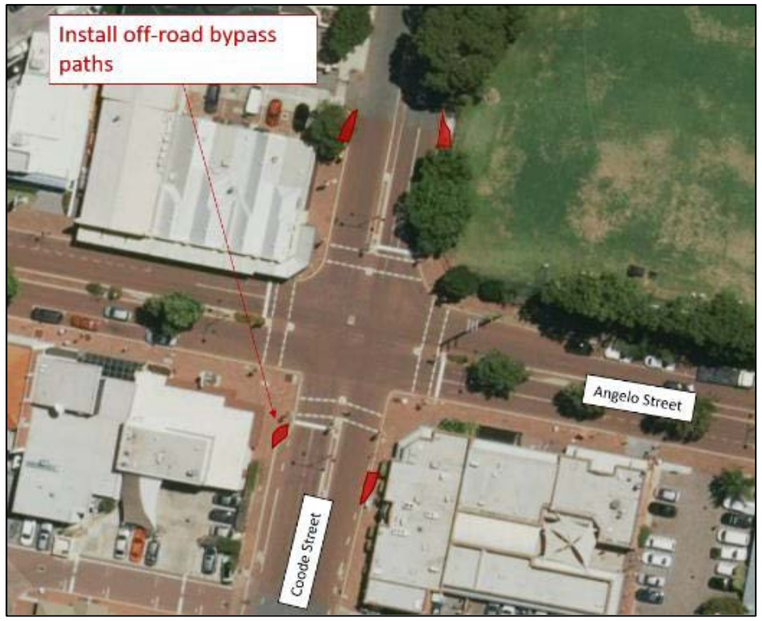
At this intersection one traffic lane diverges to two at the intersection putting cyclists into a dangerous position. The potential for road widening to provide continuous cycle lanes through the intersection is limited due to the narrow cross section and surrounding land constraints.

- Install on-ramps/off-ramps connecting from on-road cycle lanes to allow cyclist to cross at the pedestrian signal crossings and then re-enter cycle lanes after the intersection.

- Coode Street/Angelo Street intersection

At this intersection one traffic lane diverges to two at the intersection putting cyclists into a dangerous position. The potential for road widening to provide continuous cycle lanes through the intersection is limited due to the narrow cross section and surrounding land constraints.

- Install off-ramp connecting from on-road cycle lane to allow cyclist to cross at the pedestrian signal crossing; and
- Further investigate the continuation of cycle lanes at the north approach and departure.



- Coode Street/Mill Point Road intersection

The intersection provides a squeeze point putting cyclists in a dangerous position.

- Investigate installing advanced stop cycle boxes at the intersection on the southern approach.

- Coode Street (between Mill Point Road and the South Perth Foreshore)
  - Upgrade the existing footpath between the South Perth Foreshore and Mill Point Road to a 2.5m-3.0m red asphalt shared path with appropriate line marking and signage, ensuring appropriate tie in to the Mill Point Road intersection. Additionally, consider the installation of cycle friendly traffic calming devices to reduce vehicle speed for on-road cyclists.

8.3 Minor Works Improvements

Several infrastructure improvements to additional cycle routes, not captured in the key project recommendations, have also been identified where relatively minor works is required. It is proposed that these 'quick win' projects are also completed over the next five years to improve the amenity of cycling routes. These improvements are listed below:

8.3.1 Thelma Street

- Remove 'pedestrian only' signs and install shared path signage along the Wesley Playing Fields;

- Install an appropriate off-road bypass path with smooth transition at the traffic calming device;

- At the existing roundabout of Thelma Street/Murray Street, the connection to the existing shared path from the Thelma Street on-road cycle lanes is currently inconvenient for cyclists. Investigation into improving this important east-west connection for cyclists should be undertaken;

  An infrastructure option that could be investigated is the installation of a direct ramp connection for westbound on-road cyclists connecting to the off-road path. This type of treatment is not believed to have been used in Perth, and could be trialled to determine whether it provides a safe option;

- It has been observed that vehicles often park on the existing shared path along Thelma Street (west of Murray Street) during peak parking demand periods at the adjacent Penrhos College. This parking is not acceptable and should be enforced by the CoSP. Regular monitoring of the area by CoSP rangers and fines to offending vehicles should be given. Additional signage could also be erected to indicate no parking is allowed. The level of compliance should be monitored in the short term, and more permanent protection of the path (i.e. flexible bollards) should be investigated if there is continual non-compliance;

- Install an appropriate off-road bypass path at the Thelma Street/Labouchere Road intersection; and
- Install a pedestrian crossing connecting directly to the Thelma Street overpass.

8.3.2 Labouchere Road

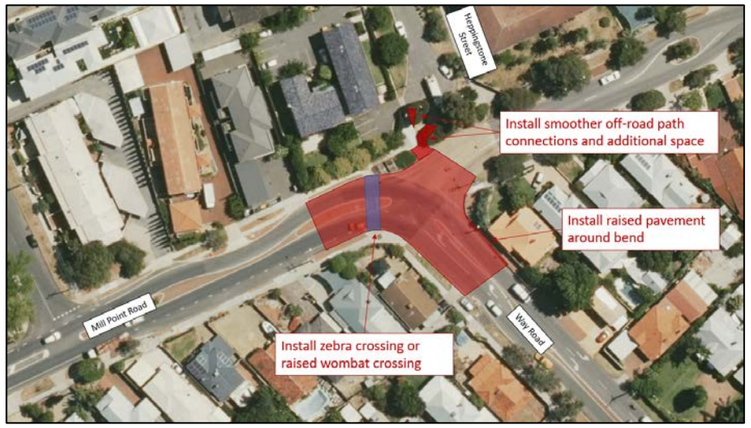
- Install appropriate off-road bypass cycle paths connecting to the existing on-road cycle lanes at the Preston Street and Thelma Street intersections.

8.3.3 Welwyn Avenue

- Install appropriate off-road bypass cycle paths connecting to the existing on-road cycle lanes at the Hope Avenue and Conochie Crescent intersections; and
- Investigate the indentation of the existing on-street car parking bays on the eastern side of Welwyn Avenue, just south of the Griffin Crescent intersection into the verge to allow the continuation of on-road cycle lanes outside of the door zone of vehicles.

8.3.4 Mill Point Road

- Investigate the modification to the intersection of Mill Point Road and Way Road to slow vehicles approaching the bend and enhance the connection to Heppingstone Street whilst providing safe and convenient access to the existing on-road cycle lanes on Mill Point Road. A potential option could be to install a raised plateau at the intersection with zebra crossing to slow vehicles and allow priority crossing for pedestrians and cyclists.



8.3.5 Manning Road

- Widen the existing pram ramp on the western crossing of the Manning Road/Centenary Avenue intersection to allow additional storage space for crossing cyclists.

8.3.6 South Terrace

- Investigate the modification of the traffic calming devices between Murray Street and Hayman Road, which currently require eastbound cyclists to exit the roadway and use the existing path that is shared with pedestrians. Consistent with the surroundings calming devices, a dedicated path or lane for cyclists is required, to reduce conflict for cyclists.

8.3.7 Melville Parade shared path extension from Richardson Street

- Install a new shared path connection from the existing Richardson Street shared path to the Kwinana Freeway overpass.

8.3.8 Banksia Terrace

- Investigate improvements to lighting, signage, pavement surface and general amenity of the existing underpass. Modify the access to the cycle path to provider a smoother transition for cyclists; and
- Investigate providing priority for cyclists across the Third Avenue and Fourth Avenue intersections. Note the example below of cycle path priority across a minor intersection (Leake Street, Bayswater).

8.3.9 Bicycle Detection Loops

A common issue is the consistency of application of bicycle detection loops at signalised intersections. Without bicycle detection loops traffic signals will not be activated until general vehicles arrive at the intersection. This can often add frustration and inconvenience for cyclists during off-peak periods. The CoSP should audit all intersections within their jurisdiction to identify all applicable intersections that do not have bicycle detection loops and liaise with Main Roads to implement them.

8.4 Areas Outside Local Government Control

A number of issues identified are located in areas outside of local government control. It is proposed that the CoSP lobby for improvements to these areas, as described below:

8.4.1 Canning Bridge and Kwinana Freeway PSP (south of Canning Bridge)

The Kwinana Freeway PSP is highly patronised by both pedestrians and cyclists (particularly on weekends) and is a critical element of the cycle network.

- The section of PSP south of the Canning Bridge is poorly lit, particularly in sections through dense vegetation creating an insecure environment;
- The surface of the PSP through this section is in need of resurfacing with sporadic patchwork along the route and an inconsistent edge line which can be difficult to see at high cycle speeds; and
- Sand was also observed along the PSP through this section

The Kwinana Freeway PSP is under the control of Main Roads and as such it is recommended that the CoSP lobby to Main Roads to consider the following:

- Kwinana Freeway PSP (between Canning Bridge and Mount Henry Bridge)
  - Review this section of the PSP and investigate the feasibility of separation or path widening. Cyclist volumes for this section are approximately 1,265 per day (2014/2015, Main Roads permanent counter). It is recommended that the daily volume of pedestrians should be surveyed to determine the peak demands and justify the separation or widening;
  - Resurface existing path and install edge lines to improve demarcation of path;
  - Install path lighting; and
  - Ensure that the PSP is maintained regularly through liaison with Main Roads.
- Canning Bridge
  - Sections of the PSP under Canning Bridge is flooded during high river tides and wet weather. It is recommended to adopt a similar treatment to the shared path beneath the Causeway in Victoria Park;
  - Cyclists are required to cross Canning Highway at four signalised crossings to access Canning Station with high delays. Improved priority for cyclists connecting to Canning Station should be investigated. The above should be considered in any future works planned in this area by the Transport Portfolio;
  - As part of the Canning Bridge Activity Centre Plan, a future ferry terminal is proposed, which should provide priority access for pedestrians and cyclists and should be considered in any future works; and
  - The Public Transport Authority monitor the usage of the bicycle storage facilities. Any future works should consider modifications and potential upgrades to these facilities.

8.4.2 Canning Highway crossing at Cale Street

Cale Street provides an important east-west connection through the CoSP and provides a convenient connection to the Labouchere Road cycling route. The existing crossing of Canning Highway is an issue as it is not wide enough to accommodate cyclists. The following is recommended:

- Investigate providing an appropriate staggered crossing across the Canning Highway intersection to facilitate cyclists, in liaison with Main Roads. A staggered crossing is one that is provided at a slight distance apart, therefore preventing users from crossing in a straight line.

8.5 Supplementary Project List

While investment in cycling infrastructure is highly important, there are a range of additional measures that can be employed to complement this investment, which are included in the following section.

8.5.1 Wayfinding

Wayfinding informs users of their surroundings in the built environment. It is important to show information at strategic points to guide people in the right directions. There is currently a lack of information on most routes, including directions to key links and areas of activity. The previous strategy was completed in 2010 and requires updating. It was noted during the saddle surveys that the signage used for wayfinding needs updating (see Figure 8-4).

Figure 8-3: Lack of wayfinding at Sir James Mitchell Park foreshore path intersection with Coode Street path.

A wayfinding strategy for the state-wide strategic cycle network is currently being developed by the DoT. Some of the key routes of the strategic network are within CoSP and therefore an updated wayfinding strategy for the ToVP local network will require alignment with the strategic network wayfinding. This is particularly important for key attractors and destinations, such as Perth Zoo, Curtin University, Mends Street and Jetty, Preston Street and Manning Hub. Particular routes mentioned include Douglas Avenue/Lawler Street, Banksia Terrace, and at all freeway overpasses.

It is recommended that a joint local wayfinding strategy is undertaken over both CoSP and ToVP council areas. Liaison with Curtin University and other key destinations (i.e. Perth Zoo) should also be undertaken to provide improved awareness and consistency of entire cycle routes to local destinations (particularly at key intersections). For example, strong wayfinding from Canning Bridge to the Causeway should be provided to indicate a clear alternative route to Canning Highway for cyclists. Creative and playful branding for wayfinding signage could also be explored, such as the example shown in Figure 8-5 which was completed as part of the DoT's Your Move program (discussed further in Section 0).

Figure 8-4: Existing cycle wayfinding at Thelma Street /Murray Street intersection

Figure 8-5: Cycling wayfinding pavement markings in City of Wanneroo

8.5.2 Bike Parking and Amenities

Bike parking and amenities help complement the cycle network by reducing inconveniences associated with cycling. There is a demand for end of trip facilities at a number of locations throughout CoSP, particularly at areas with commercial activity. An audit/gap analysis of existing end of trip facilities is recommended to help gain an understanding of current supply and demand which would inform Council of the locations that could be benefited the most from investment. The size and type of facilities that are suitable (i.e. secure bike parking, sheltered and functional bike racks and lockers) should also be considered in the analysis. The term bike rack refers to the device to which you fix your bike to. It is recommended that these be in the form that supports the entire bicycle (i.e. U-rails) and allows users to lock the bicycle frame and wheels (Department of Transport, 2014). Retrofitting vertical poles with bicycle parking racks is a potential option to increase bicycle parking. The CoSP should also aim to install bicycle parking racks at all sports grounds and playgrounds.

There is also a lack of bicycle repair and pump stations throughout CoSP, and is recommended that these be located in popular destinations with the end of trip facilities. Additionally, water supply stations should be located throughout the cycle network.

In addition to the completion of an audit/gap, it is recommended that the following parking and amenities be installed:

- Bicycle Pump and Repair Station:
  - Mends Street Jetty;
  - Manning Hub;
  - George Burnett Park; and
  - Along the South Perth Foreshore at Coode Street.

It is noted that a bicycle repair station is proposed at the west side of Canning Bridge (City of Melville).

- Water fountains are also recommended to be installed at the above locations.
- Secure and sheltered:
  - In line with the 2017 South Perth Peninsula Place and Design Report it is recommended to provide secure and sheltered cyclist storage capable of accommodating more bicycles near the Mends Street Jetty.
- Sheltered Bike Parking
  - Mends Street;
  - Manning Hub;
  - Angelo Street shops;
  - Preston Street shops (i.e. IGA);
  - Como IGA;
  - Moresby Street shops;
  - Canning Bridge (liaison with PTA);
  - Major bus stations; and
  - South Perth Operations Centre.
- Bike racks
  - George Burnett Park;
  - Angelo Street Shops;
  - Clontarf Campus; and
  - Richardson Park.
- It is recommended to explore the use of bike parking as a tool to enhance the urban environment (i.e. art bike racks). Opportunities to advertise the health and environmental benefits of cycling, and behaviour change programs, events, and campaign should also be explored; and
- In addition, the CoSP should investigate the installation of e-bike charging stations to encourage and cater for the potential increased use in e-bikes. A potential location to include an e-bike charging station is along the Mends Street precinct.

Figure 8-6: Bicycle shaped bike rack

8.5.3 Cycle Monitoring

The use of cycle counters helps to understand cycling patterns over time and inform cycle-related projects into the future. There is currently a lack of cycle data available in CoSP.

Three permanent cycle counters currently exist in CoSP, which are located on the Kwinana Freeway PSP at Mill Point, the foreshore separated path at Sir James Mitchell Park, and separated path off Henley Street (adjacent to Como Secondary School).

It is recommended that cycle data collection be increased for CoSP and analysed on a regular basis (i.e. annually) to determine changes in cyclist use. Permanent counters should be installed along key cycle corridors and temporary counts should be undertaken when possible as part of road traffic counts. PBN grant funding is also available for cycle data collection, which should be applied for. The following locations are recommended for the installation of permanent bicycle counters:

- Manning Road shared path on the south side, west of Kent Street. This will help capture trips heading east-west through CoSP and to Curtin University. This will also help measure the success of the proposed shared path upgrade (refer to Project 3 in Section 8.2);
- Hayman Road shared path, on the south side west of Kent Street. This will help capture trips heading north west-south east through CoSP from the Swan River Foreshore to Curtin University;
- Lawler Street Safe Active Street. This will help capture trips heading north west-south east through CoSP to/from the Swan River Foreshore. This will also help measure the success of the proposed works as part of Project 4 in Section 8.2; and
- Thelma Street shared path, just west of Murray Street. This will help capture trips heading east-west through CoSP. This will also help measure the success of the proposed works as part of Project 5 in Section 8.2.

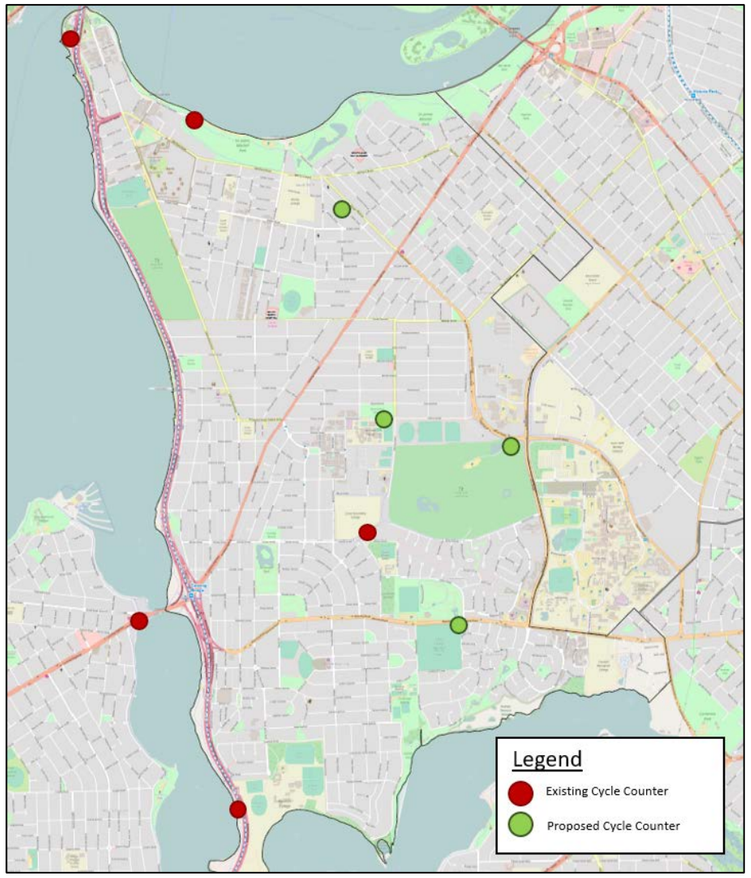


Figure 8-7: Proposed location of permanent cycle counters in CoSP

In addition, the number of pedestrians using shared paths should be monitored regularly (i.e. using video surveys), to assess demand and justify the potential need for path widening or separation. The CoSP should allow for the collection of pedestrian data at the above sites on a regular basis, i.e. annually.

8.5.4 Dedicated Cycle Tracks

Cycle tracks located in community parks for recreational use are increasing in popularity throughout Perth. These facilities provide an environment for cyclists to ride separate from general traffic. A number of local governments have installed cycle track facilities in Perth which have been observed to have high levels of use. Two popular types include:

- Pump Tracks – These facilities often consist of circular loops with smooth dirt mounds and berms that cyclists can ride around in a pumping motion. These facilities can also include bike jumps, which are associated with more experienced cyclist skills; and
- Bike Skills Track – These facilities often consist of asphalt path circuits with pavement markings and signage simulating an urban traffic environment. These facilities are targeted for youth/beginner cyclists.

The highest cycling participation rate for CoSP was among children aged under 10 and is also considerably higher than for Perth. In addition to the community feedback, it is clear that there is a considerable demand is likely for Bike Skills Track and Pump Track facilities.

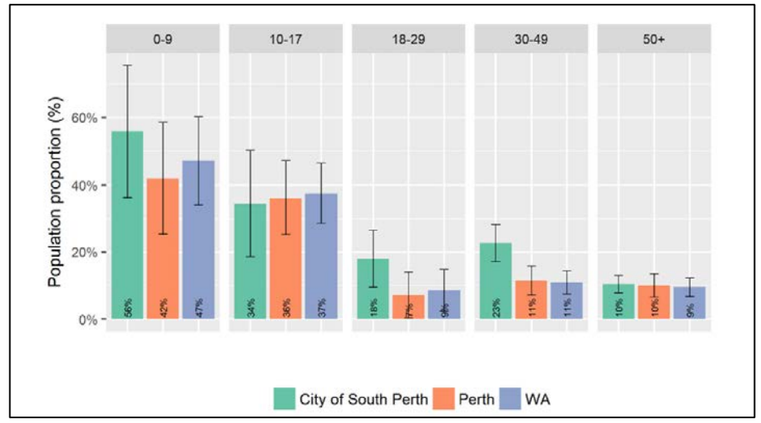


Figure 8-8: Cycling participation by age (source: National Cycling Particpation Survey 2017)

A recent example for this is at Shepherds Bush Park in Kingsley, Joondalup. This facility has a ‘Pump and Jump Track’ which additionally features jumps to offset the replacement of the BMX park. A children’s Bike Skills Track is also located adjacent to this.

Figure 8-9: Shepherds Bush Bike Skills Track (left) and Pump and Jump Track (right) (source: City of Joondalup)

It is proposed that a Pump Track and Bike Skills Track be constructed at George Burnett Park at suitable location (see Figure 8-10). This location provides adequate space, cycle connections, parking, public bathrooms and barbeque facilities. This corresponds with existing uses at George Burnett Park which consists of an existing cycle loop track and skate park. The facility should consider CPTED (Crime prevention through environmental design) principles.

Figure 8-10: Potential locations of for Pump and Bike Skills Tracks at George Burnett Park (source: ArcGis)

State funding is available for these projects as part of the Trails program. Comparing to the Shepherds Bush Park facilities, the Bike Skills Track can expect a construction cost of approximately $60,000 and the Pump Track $70, 000. It should be noted however that these facilities are the largest of their type in the State, and could be smaller. Construction of Pump Tracks requires specific expertise and youth services are required for involvement in the design and operation. A yearly maintenance budget must also be considered for the facilities. Lessons learnt from previous councils should be enquired further prior to the development of the project (i.e. City of Joondalup), to more accurately understand project considerations. It is recommended to investigate existing dedicated cycle tracks in CoSP (i.e. kids track at Manning Primary School). Those determined as suitable could be considered for inclusion on the Your Move metropolitan map.

8.5.5 Trial Projects

Trial projects help kick-off new initiatives and projects that benefit cycling. A number of recent trial projects have proved successful including in CoSP such as the RAC Intellibus, which has attracted a high number of people to visit South Perth Esplanade to trial the fully driverless shuttle bus. The Safe Active Street projects have also received funding by DoT (i.e. Shakespeare Road, City of Vincent) which has helped with construction and marketing for alternative cycle treatments.

It is recommended to investigate the following projects:

- Innovative solutions to improve cycling priority
  - As part of the Connect South Project, support the introduction of a ‘shared space’ along the high activity area of Mends Street. The shared space concept involves reducing the posted speed limit to 30km/h and integrating all road users to provide pedestrians and cyclists with movement priority.
- Cycle volume and speed device
  - Investigate the installation of an automated cycle counter, such as the ‘Bike Barometer’ (see Figure 8-11). This device records passing cyclists and pedestrians, and displays real-time cycle counts for the day, month, year and sometimes lifetime of the device. Not only does a device such as this help understand cycle patterns, but also raises awareness for cycling and gives cyclists a sense of public acknowledgement for choosing to cycle. Encouraging messages that display the benefits of cycling can also be incorporated into the device, i.e. “*You have saved the economy $XX by cycling today*”, “*you saved XX fuel emissions today*”. These devices have been fitted in locations around the world, as well as in Australia. The bike barometer shown in Figure 8-11 was fitted as part of a joint venture between a local bike store and the City of Moreland.

    A potential location includes the shared path on the south approach to the Narrows Bridge.
  - Investigate the installation of a device that indicates real-time speed to cyclists along shared paths (similar to roadwork sites) and to ‘slow down’ if required. This can help promote behaviour change, encouraging cyclists to reduce speed in areas of high pedestrian and cyclist demand. A potential location includes the shared path west of the Mends Street jetty. This improves safety for sustainable travel modes, which could potentially attract funding from RAC, as it aligns with their mobility agenda.

Figure 8-11: Example bike barometer in Melbourne,Victoria (source: *http://www.velocycles.com.au/over-counter/*)

- Curtin University Bike Share Scheme
  - The proposed cycle network will significantly improve the cycling connection between Curtin University and Perth rail lines. Through the proposed Canning Bridge to Curtin Link project (CoSP project 2 in Section 8.2) there will be an improved cycling connection between Canning Bridge Station and Curtin University, and through the Kent Street project (ToVP project 2 in Section 15.2) there will be an improved cycling connection between Curtin University and Victoria Park and Carlisle Stations. It is recommended that CoSP work with Curtin University and the ToVP to investigate establishing a bike share scheme with bike share docking stations located at Canning Bridge Station, Victoria Park and/or Carlisle stations and Curtin University to complement the proposed projects as part of this Plan. The potential for bike docking stations at other key locations where there is the potential for high uptake, i.e. high density locations and/or high percentages of student housing should also be investigated. The stations should be provided in locations that provide good passive surveillance, lighting and with good accessibility to the destinations.
  - Urbi bike share facilities have recently been installed at the City of Joondalup as part of a 12-month trial, with stations located around the town centre. Urbi is partnering with a number of businesses in Joondalup, such as Edith Cowan University which offer discounts to students. The scheme works by registering on the Urbi phone application, locating a bike share station, unlocking the bike and helmet (with a code supplied by the phone application), cycling for a maximum of 45 minutes, returning to any bike share station, and finishing the hire (see Figure 8-12). Payment is completed through the phone application, and is costed per a single, daily, weekly, or monthly rate provided trips are less than 45 minutes. Trips that exceed 45 minutes are charged an additional $6 per hour.

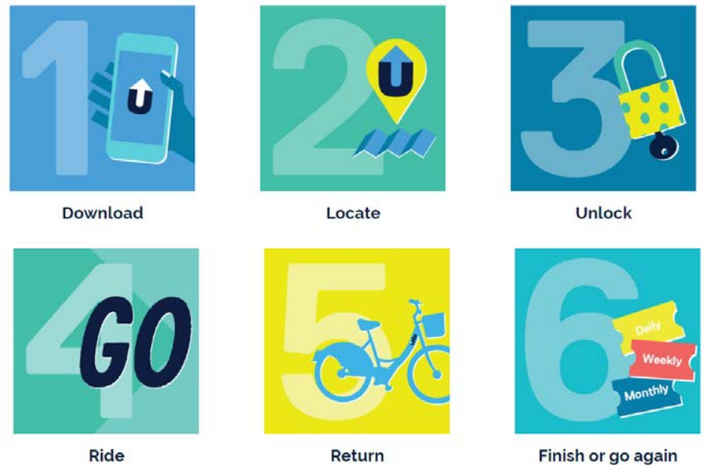


Figure 8-12: Six steps for use of Urbi Bike Share (source: *http://urbi.bike/*)

  - The 2017 South Perth Peninsula Place and Design Report proposed to support public bike-share implementation and installation where possible, potentially in cooperation with the City of Perth to establish a shared system with hire stations on both sides of Perth Water. This should be further investigated. A consistent state-wide bike share scheme could provide increased benefits overall (i.e. better legibility and consistency in equipment), but would require state level involvement.
- Alternative cyclist transition at three-legged roundabouts
  - As discussed in Section 8.3.1, an infrastructure option that could be trialled at the intersection of Thelma Street/Murray Street is the installation of a direct ramp connection for on-road cyclists connecting to an off-road path. This would provide a convenient option for cyclists. This type of treatment is not believed to have been used in Perth, and could be trialled to determine whether it provides a safe option.

8.5.6 E-bike Scheme

E-bikes are gaining in popularity and could help encourage people to cycle because they do not require as much physical energy to operate compared to traditional bikes and allow a longer distance of travel for the equivalent amount of energy expenditure.

E-bike salary sacrificing has recently been ruled in favour of by the ATO and as a result, there are leasing and financing companies that provide e-bike packages to employers. The program typically works by deducting a monthly fee from the employee's wage, which is the pre-tax wage if the employee agrees to use the bike predominantly for work-related travel. It is recommended that CoSP/ToVP offer an e-bike salary sacrifice service to City staff and promote to other organisations to offer the same service.

8.5.7 School Infrastructure Improvements

Cycle safety for youth is a critical aspect that must be considered for schools. Four primary schools in CoSP have been previously audited for cycle infrastructure with a number of infrastructure improvements recommended. It is recommended that these improvements be completed and more schools also be audited. As part of this work, consideration of 'school zones' should be investigated, where access to the area is restricted to vehicles and prioritised for cycling and walking. This was raised as a potential treatment from the community workshop, and could be investigated as a trial project.

As part of the school cycle infrastructure improvements, a marketing campaign aimed at parents could be undertaken to encourage students to cycle to school. Incentives and rewards for students that cycle could also be implemented. This could then lead to a reduction in demand for car parking. Additionally, this could increase the social acceptability of children riding to school unsupervised.

8.5.8 Behaviour Change Projects

In order to maximise the benefit of cycle infrastructure improvements, it is recommended to employ cultural and behavioural change strategies to encourage more people to participate in active transport and realise the benefits of the investment.

8.5.8.1 Your Move

The Department of Transport's Your Move program supports communities, local governments, schools and workplaces to promote active transport and reduce congestion. The two parts of the Your Move Program include:

- Joining Your Move online
  - Support is offered to local government, school and workplace 'champions' who want to promote walking, cycling and public transport. Through registering on the Your Move website, organisations can access information, run travel surveys, choose activities to implement, and share activities to earn rewards. Training and networking forums also run each quarter.
  - It is recommended that CoSP sign up to the program to enable internal champions to drive the Program at the council. Having CoSP lead the program in the area will encourage other organisations to also participate.
  - It is also recommended that CoSP engage with a number of organisations in the area to promote the program (i.e. Curtin University).
- Intensive Project Partnership
  - The Department of Transport also undertakes intensive projects to influence travel choices for specific local governments, schools and workplaces. The program has previously partnered with the City of Cockburn and the City of Wanneroo where it provided area specific services and products. As part of Your Move Central a number of city workplaces and households in ToVP were partnered in addition to two local primary schools (i.e. Victoria Park Primary and Ursula Frayne Primary). A number of activities undertaken at the schools included National Ride to School Day events, reward schemes via posting activities on the Your Move website, a breakfast event which involved Transperth journey planning and SmartRider discounts, and branded monsters along routes to encourage youth interest.
  - It is recommended that the program be investigated with DoT for selected local primary schools (i.e. Manning Primary School, South Perth Primary, Como Primary, Collier Primary and Kensington Primary).
  - It is recommended that a similar program be investigated with DoT for opportunities for other schools and workplaces across the council area. The timing and location of future intensive projects will depend on funding and strategic priorities, such as the state government's Metronet initiative. This may lead to opportunities for partnership with Curtin University, to better integrate with the surround train services.

Figure 8-13: Your Move program methodology (source: Department of Transport)

8.5.8.2 Active Transport Events

One of the major objectives of involvement in cycling and walking events is to encourage first-time users to 'give it a try.' While participation in one event may not convert the individual, the culmination of a number of events over time will considerably break down barriers, which increases the chances of changing travel habits.

Public Events

A number of annual public events are held in Perth that encourage active travel. Promotion of these events, by CoSP, could be achieved by:

- Registering a CoSP team into these events;
- Sponsoring events, i.e. hiring a bike doctor to attend public events;
- Sponsoring CoSP staff entries;
- Facilitating fundraisers for particular staff participants;
- Run rewards schemes based on participation. MBS Environmental previously ran a raffle which allowed staff to enter a ticket for each day they cycled to work during Bike Week. This encourages more than a single trip to work by bicycle; and
- Running events in CoSP that support public events. As an example a breakfast could be provided to staff who cycle or walk to work during Bike Week.

Some of the public events that promote cycling to work include:

- Bike Week- an annual celebration held in Western Australia where a number of events are held during a specific week. CoSP has previously participated in this, such as the 'Fiesta and Bike week' event organised in 2015, which included complimentary bike repairs and snacks at the Narrows Bridge followed by a leisurely ride along the South Perth Foreshore;
- Ride2Work Day- held annually in October, it works by providing a range of incentives at key commuting destinations in cities. In 2017, a breakfast was provided at Elizabeth Quay in the Perth CBD for those who had cycled to work on that day; and
- Ride2School- Ride2School Day held is annually in March and works by encouraging active travel within school communities by celebrating those who already actively travel to school and encouraging those who don't know how to start. A number of schools in CoSP have previously been involved in this event. The Ride2School Program is also available all year-round and works with families, communities, policy-makers and partner organisations to encourage students to ride, walk, skate or scoot to school.

Local Events

In addition to supporting public events, it is recommended that CoSP facilitate events specific to the local government including:

- Introduction of an Active Commuters Breakfast or equivalent could be held for staff where a complimentary breakfast could be provided to those who choose active transport methods on that particular day. An additional incentive could include hosting a bicycle mechanic who can complete free tune-ups of attendees' bikes. A potential location for this could include at a local shopping centre, which could provide the opportunity for local advertising. Partnership opportunities could be sought with local cycling groups, such as South Perth Bicycle Users Group, to offer subsidies to promote, organise and run these events.

8.5.8.3 Awareness Campaigns

There is a lack of cyclist and driver awareness and education throughout South Perth and the wider area. It is recommended that as part of wayfinding and revitalisation of cycle infrastructure, pavement markings and signage be installed that educate and raise awareness of the needs of other modes and how they can successfully operate together. The 'Take Care' pavement markings in the City of Perth is one current example.

A publicity campaign aimed at increasing awareness of cyclists and improving the behavior of all road users would help to counter these problems and improve cyclist safety. The WA Police Force could be invited to be a part of awareness campaigns to educate road users on cycling. Tools that can be used include street advertisements, billboards and advertisements. An example ‘Share our Roads’ campaign to improve bike safety in WA. Campaigns should aim to ‘normalise’ cycling and reinforce the image of cyclists being of all ages and demographics.

Joint awareness campaigns could be undertaken jointly by both CoSP and ToVP, and should also involve other organisations such as Curtin University who are in the process of developing a strategic behaviour change strategy.

8.5.8.4 Information

It is important that information regarding the existing cycle infrastructure is made readily available to the community, so that cycle trips are made as convenient as possible. A *Map Your Move* metropolitan map (previously TravelSmart) for the CoSP that displays walk and cycle information (available at the *Your Move website*) should be made easily available on the CoSP website. A supply of hard copies should also be available at CoSP reception.

The following information should also be made readily available to the community, i.e. on the CoSP website to encourage increased cycling:

- Information on current and planned cycling initiatives and incentives; and
- Information on e-bikes, including the increased advantages and where to acquire them.

8.5.9 Integrated Transport Plan

The 2012-2017 South Perth Bike Plan recommended 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). It is recommended that this plan be developed within the next five years.

9 Implementation

A total of seven cycling infrastructure projects, along with minor works improvements are proposed within the CoSP over the next 5 to 10 years. As mentioned earlier, high level order of cost estimates have been determined for these projects, however further investigation will need to be undertaken to develop detailed concepts and understand the true cost of each project.

As summarised in Table 9-1, the estimated cost of implementation is approximately $7.3 million. This indicates that an estimated $7.3 million is spent over the next five years to achieve the goals of this bike plan. Although this may be ambitious, a strong pledge is required to make the CoSP stand above the rest in terms of becoming a cycling city.

It is suggested that the CoSP firstly submit all the applicable projects to relevant grants and sponsorship programs for funding. It would then be preferable to approach other relevant agencies such as DoT to determine how best to implement the projects in their jurisdiction. Boundary road projects should be presented to adjacent local councils in an attempt to partner with the respective councils to implement these specific projects. The joint nature of this plan will make this process particularly advantageous with the ToVP. Also prospective business partnerships should be identified early in the process, to get business buy in and potentially set up public private partnerships.

Finally, once all of the proactive steps have been taken, the City should have a good idea of which projects could be funded, completely or partly, by grants and sponsorships, which projects could be funded by other agencies such as DoT, which projects could be funded as part of a partnership with other councils or businesses, and which projects will have to be funded completely by the CoSP.

All of this information along with the priority of projects should then be taken into account in an exercise to allocate projects and stages of projects to the forward capital works schedule of current and future years.

Funding of the proposed supplementary initiatives described in Section 8.5 will require further investigation. As part of future more detailed costing works for each of the key infrastructure projects, funding for the supplementary initiatives should be included. In addition, the cost of some supplementary initiatives could be incorporated into the project with assistance from other sectors, for example marketing, landscaping and streetscape. Trial projects could also attract funding from other agencies such as Main Roads and RAC. The proposed pump and bike skills tracks at George Burnett Park should be built in tandem with the Canning Bridge to Curtin Link or Manning Road projects as these will provide direct links to the facility. Funding for the pump and bike skills track can be investigated further, with potential funding available from the DoT and Lotterywest.

It should be noted that the maintenance of all cycling infrastructure paths should be undertaken regularly and included in the capital works schedule.

Table 9-1: Summary of estimated 5-year implementation cost for the CoSP

#	Project	Estimated Cost	Potential Funding Assistance
1	South Perth Esplanade Project	$1.5m	DoT, RAC
2	Canning Bridge to Curtin Link	$1.8m	50% DoT
3	Manning Road Project	$600k	50% DoT, Lotterywest
4	Douglas Avenue Project	$1.5m	50% DoT
5	Thelma Street Investigation	$30k (investigation)	50% DoT
6	Kent Street Project	$400k	33% DoT, 33%Curtin University
7	Coode Street Project	$500k	50% DoT
8	Minor Works Improvements (“Quick Wins”)	$1m	Capital Works Programme
	TOTAL	**$7.3m**	

The estimated timeframes proposed for the cycling infrastructure projects are shown in Table 9-2. It is proposed that the highest priority projects are implemented first, with minor works improvements undertaken every year.

It should be noted that the estimated timeframes is intended to provide guidance only. Opportunities may arise over the implementation of this Plan which may fast track or hinder the progress of projects.

Table 9-2: Indicative five year implementation plan for the CoSP

#	Project	2018/19	2019/20	2020/21	2021/22	2022/23
1	South Perth Esplanade Project					
2	Canning Bridge to Curtin Link					
3	Manning Road Project					
4	Douglas Avenue Project					
5	Thelma Street Investigation					
6	Kent Street Project					
7	Coode Street Project					
8	Minor Works Improvements					

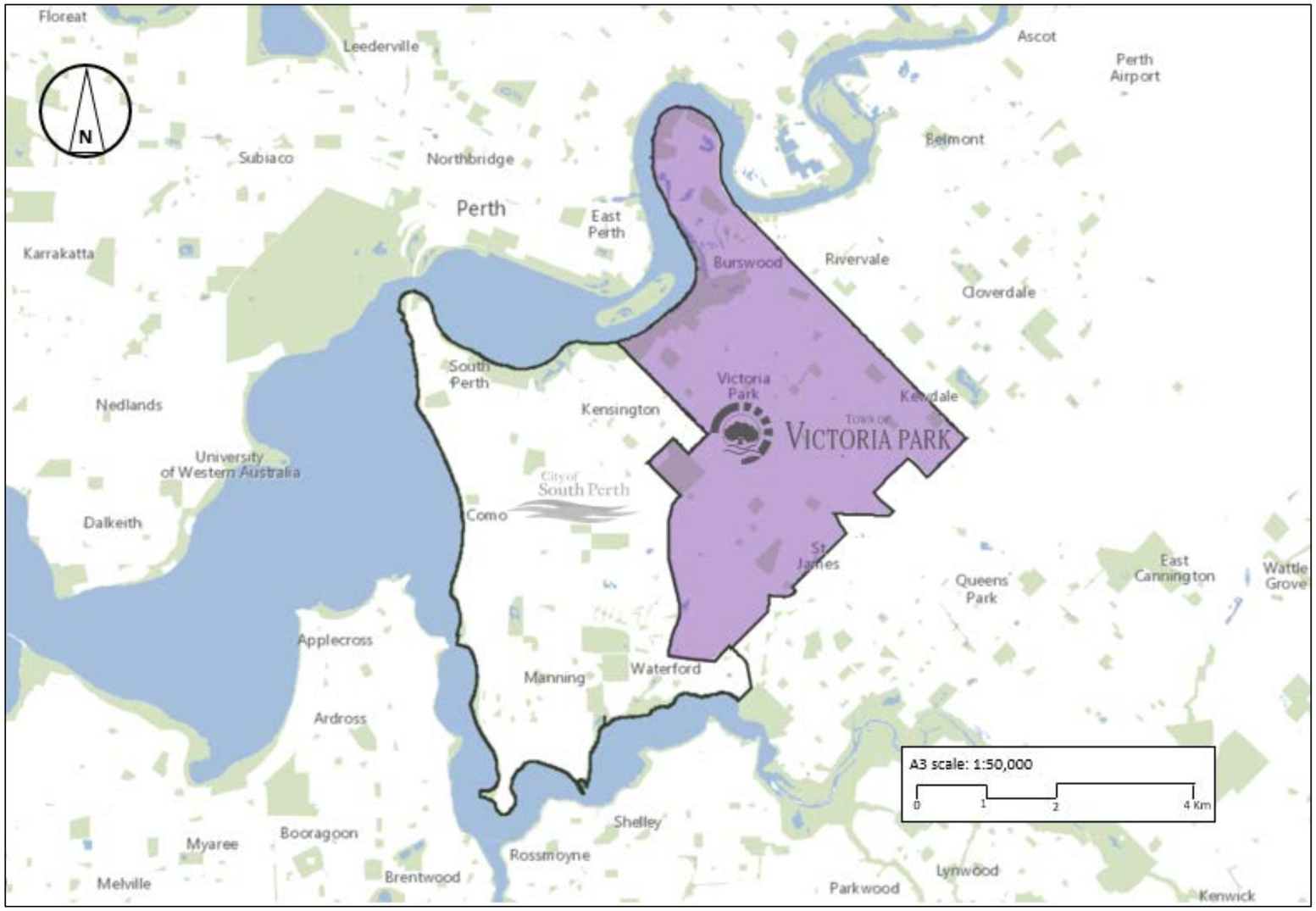
TOWN OF
VICTORIA PARK

10 Background

The Town of Victoria Park is located approximately five kilometres south east of Perth's Central Business District (CBD) and covers an area of approximately 18 square kilometres. The City of South Perth shares boundaries with the City of South Perth, City of Canning and the City of Belmont, whilst providing direct routes over the Swan River into the City of Perth and City of Vincent.

With reference to the ToVP Community Profile (*profile.id.com.au*, 2017) the estimated resident population as of June 2016 is approximately 37,000 with a population density of 21 persons per hectare. In the development of this Bike Plan, the diverse population within the ToVP was taken into consideration. Some of the key demographic statistics for the ToVP include:

- 1.4x higher population than the City of Perth, and 1.2x higher density;
- 48% medium and high density housing;
- A median age of 34 years;
- Approximately 55% of residents have a tertiary qualification
- Approximately 40% of residents were born overseas, indicating strong cultural diversity;
- Approximately 67% of households have only one or two occupants; and
- 43% of households had access to two or more motor vehicles compared to 57% in Greater Perth. Car ownership per household in the Town of Victoria Park decreased by 3% between 2011 and 2016.



The abovementioned statistics highlight the potential for increased cycling trips in the ToVP. Car ownership has decreased within the town and therefore there is potential to encourage increased cycling. Additionally, the high percentage of households with one or two occupants highlight the potential for increased local shopping trips by bicycle due to smaller quantities of shopping that may not require the storage space of a motor vehicle.

Increased cycling in the ToVP will provide vast environmental, health and economic benefits to the community including:

- Reduced car use, resulting in less traffic congestion, demand for parking, carbon emissions, and neighbourhood noise, and improvements in air quality;
- Improved physical and mental wellbeing;
- Reduced household travel costs, and potential time savings; and
- Increased foot traffic around businesses.

Investment in creating an active community will result in better connected, safer, healthier and happier residents and will make the Victoria Park a more vibrant place to live and visit.

With reference to the ToVP Community profile (*profile.id.com.au*, 2017), the current statistics for travel mode to work for residents is shown in Figure 10-1. It indicates that approximately 62% of trips are undertaken by car (as either driver or passenger), approximately 17% of trips are by public transport, and 2% of trips by bicycle. Considering the proximity to the CBD and approximately 43% of ToVP residents work in Victoria Park and Perth CBD, there is potential to increase the percentage of cyclists.

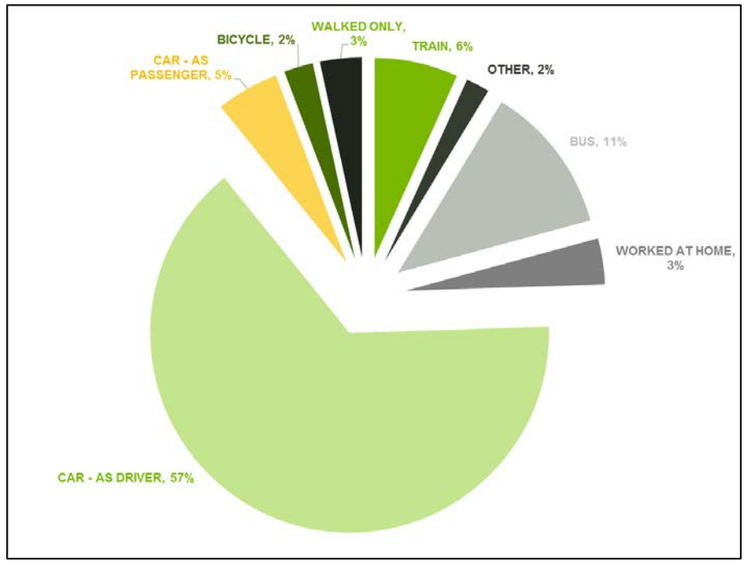


Figure 10-1: Travel mode to work in Town of Victoria Park-(Census 2016)

The age group distribution within ToVP is shown in Figure 10-2. In comparison to Greater Perth (Perth Metropolitan), there is a higher proportion of 18 to 24 year olds (tertiary education and independence) and 25 to 34 year olds (young workforce).

In 2016 there were approximately 28,000 residents who work in ToVP, with 12% living in the area (refer to Figure 10-3).

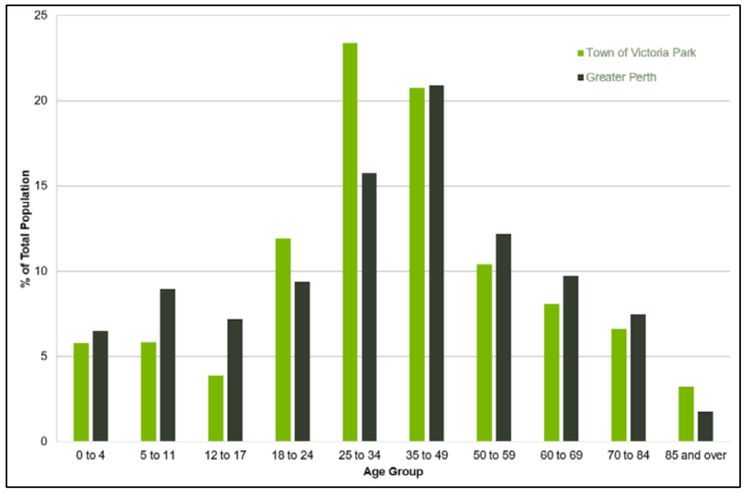


Figure 10-2: ToVP age group distribution (Census 2011)

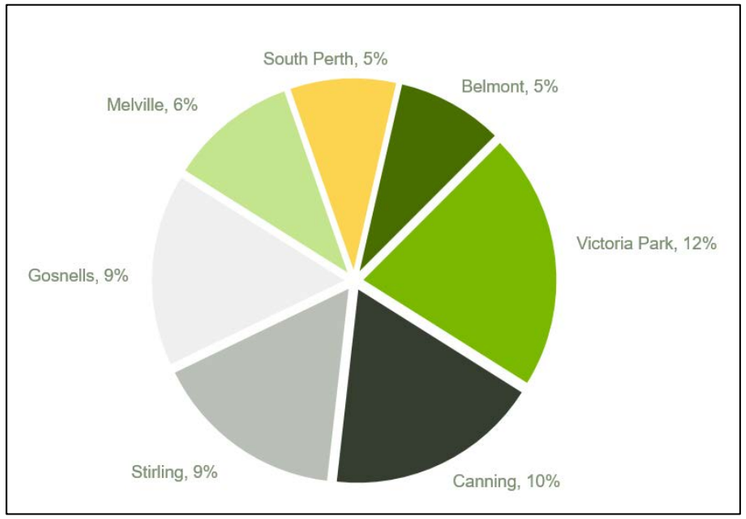


Figure 10-3: ToVP workers location of living (Census 2010)

In addition, approximately 77% of employed residents work outside of ToVP while the rest work within the area. A more detailed breakdown of employment locations is shown in Figure 10-4).

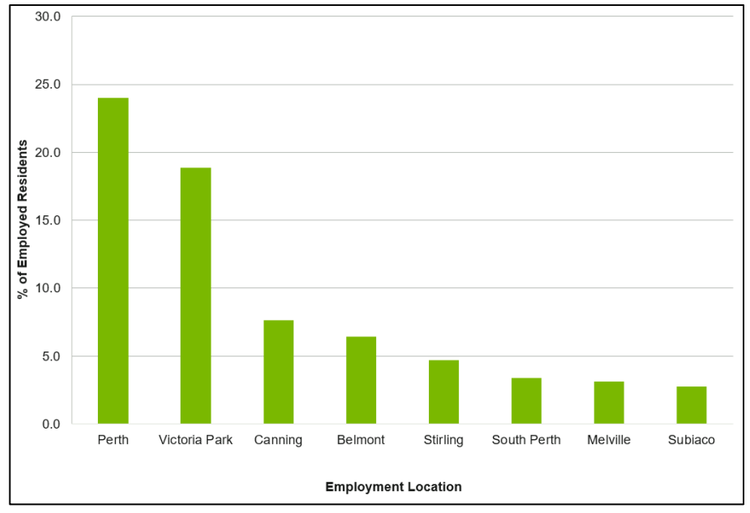


Figure 10-4: Employment location of ToVP residents (Census 2011)

11 Crash Analysis

11.1 Crash Data

Safety is a very important factor in building a successful Bike Plan. The availability and quality of existing cycle facilities is a good way of identifying the level of safety performance within a region. Main Roads WA crash data was utilised to determine the level of safety for the existing facilities within the ToVP.

Over the last five-year period 1 January 2012 to 31 December 2016, a total of approximately 5,000 crashes have occurred within the ToVP, with 2.9% of them involving cyclists. The number and severity of crashes involving cyclists per year is shown in Figure 11-1.

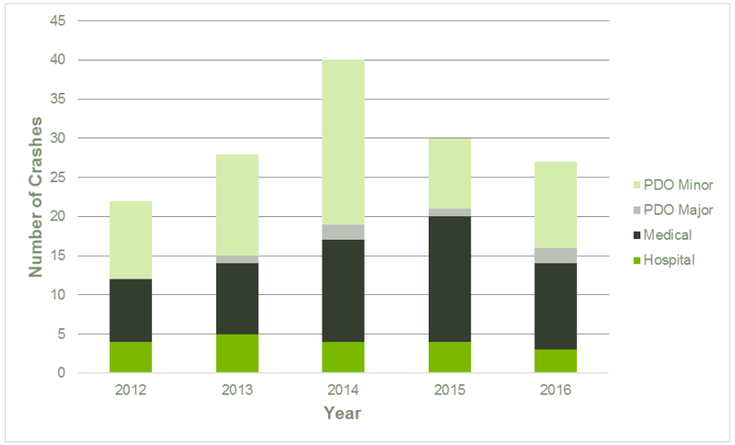


Figure 11-1: Total crashes involving bicycles

In summary:

- A total of 147 crashes involved bicycles;
- There were zero fatalities during this time;
- 13% resulted in hospital treatment; and
- 38% resulted in medical attention.

It should be noted that crash data only contains records of reported crashes, although unreported crashes are typical when there is no personal injury and no damage to property. It can be seen that the number of crashes has fluctuated over the past 5 years, 2014 has the largest number of crashes recorded.

Factors that can attribute to an increase in the number of crashes include a general increase in traffic volumes and non-compliance with speed limits. The Plan requires a strong focus on improving safety for cyclists.

The total number of recorded crashes from 2012 to 2016 grouped by severity is summarised in Figure 11-2 and illustrated in Figure 11-3.

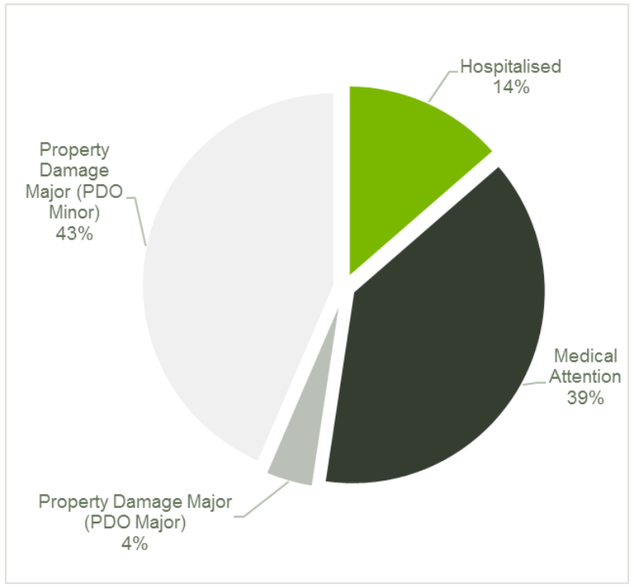


Figure 11-2: Total recorded crashes by severity

11.2 Crash Locations

More than 69% of the total recorded bicycle crashes occurred at intersections, with 24% of the intersection crashes occurring at roundabouts.

The highest number of crashes have occurred along high volume roads, i.e. Kent Street and Albany Highway (refer to Table 11-1). This accentuates the fact that cyclists use these direct routes to commute and that these roads are dominated by high traffic volumes and an increased probability of conflict, particularly at intersections where bicycles have limited priority. Albany Highway represents a major cyclist route with access to Perth City over the Causeway and has recorded a significant number of crashes. The intersections of Miller Road/Bishopsgate Street and Hayman Road/Kent Street have recorded 6 crashes and 5 crashes involving cyclists respectively in the last five years. These roads represent the high priority locations for funding directed towards crash investigation and safety improvement works.

Other notable statistics include:

- 10% of all crashes occurred at driveways, where vehicles enter or exit a driveway and collide with a cyclist in the lane or on the path; and
- 11% of bicycle crashes occurred on off-road paths.

The crash statistics have been used to influence and prioritise the recommended projects outlined in Section 15.

Table 11-1: Locations with the highest number of crashes involving cyclists

Crash Locations (roads with 5 crashes or more)		
Location	**Number of Crashes**	**Severity**
Kent Street/Roberts Road/ Miller Street	23	2 x Hospitalised
		10 x Medical Attention but not Hospitalised
		11 x PDO Minor
Albany Highway	15	1 x Hospitalised
		6 x Medical Attention but not Hospitalised
		8 x PDO Minor
Berwick Street	14	1 x Hospitalised
		5 x Medical Attention but not Hospitalised
		8 x PDO Minor
Oats Street/Hill View Terrace	8	4 x Medical Attention but not Hospitalised
		4 x PDO Minor
Orrong Road	8	2 x Hospitalised
		5 x Medical Attention but not Hospitalised
		1 x PDO Minor
Shepperton Road	6	1 x Hospitalised
		3 x Medical Attention but not Hospitalised
		2 x PDO Minor
Star Street	5	3 x Medical Attention but not Hospitalised
		2 x PDO Minor

*Note that a crash severity of 'PDO' refers to 'property damage only'

East Perth
Claisebrook
McIver
Burswood
Victoria Park
Carlisle
Oats Street
Welshpool
Queens Park
GRAND EASTERN HWY
VICTORIA PARK DR
SURREY RD
ORRONG RD
GALLIPOLI ST
GODDARD ST
MCCARTNEY CRES
ROBERTS RD
BISHOPSGATE ST
DURHAM ST
RUTLAND AVE
ARCHER ST
LION ST
MARS ST
OATS ST
PLANET ST
ALBANY HWY
MILL ST
GLOUCESTER ST
MCMILLAN ST
HURLINGHAM RD
CANNING HWY
MILL POINT RD
BANKSIA TERRACE
LAWLER ST
ANGELO ST
GEORGE ST
DOUGLAS AVE
COODE ST
SOUTH TERRACE
COMER ST
BLAND ST
THELMA ST
MURRAY ST
CALE ST
JACKSON RD
DAVILAK ST
GODWIN AVE
BICKLEY CRES
DOLTANA ST
MANNING RD
LEY ST
WELWYN AVE
CHALLENGER AVE
ELDERFIELD RD
CENTENARY AVE
KENT ST
BARON-HAY CT
DEVENISH ST
BERWICK ST
DANE ST
SOMERSET ST
HILLVIEW TCE
JARRAH RD
HAYMAN RD
BOUNDARY RD
RAILWAY PDE

Legend

- Crash Location
- Rail Stop
- Railway
- Freeway
- Highway
- Main
- Minor

Overpass/Underpass
- Existing Overpass/Underpass
- LGA Boundary (Town of Victoria Park)

- Shopping Area
- Community Facility
- Hospital Facility
- Education Facility
- Recreational Facility
- Recreational Park or Reserve
- Reserve (Miscellaneous & Other)

0 1 2 km

ToVP Figure 11-3 Crash Locations Involving Cyclists in the ToVP

Revision: 1	Project No: 255909	Date: May 2018
Prepared: S.Richards	Checked: M.LaGalia	Approved: M.LaGalia
Coordinate System: GDA 1994 MGA Zone 50		Scale @ A3: 1:27,000

Source: © Landgate 2017, Main Roads WA

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Client: Town of Victoria Park, City of South Perth

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12 Stakeholder Consultation

12.1 Community Engagement

As part of the development of the Plan, the local community were invited to provide feedback on their cycling journey with the aim of identifying common routes, existing issues, barriers to cycling, and desired locations to improve or provide additional facilities and infrastructure.

The community were invited to provide feedback through one or all of the following methods:

- Completion of a survey (online or hard copy);
- Input into an online mapping tool; and
- Attendance at a community workshop.

It should be noted that the methods of community engagement were carried out simultaneously between the CoSP and ToVP.

12.1.1 Community Survey

The joint CoSP and ToVP community survey was open to the public from May 1st to June 9th 2017. The survey was completed by a total of 349 participants, with 168 people from the ToVP (57% male, 43% female). A graphical summary of the demographics and other results from survey respondents from the ToVP is shown in Appendix D.

In terms of the reasons for cycling, the most common reasons included recreational and exercise (30%), commuting to/from work (24%), to/from shopping (13%) and to/from entertainment locations (13%), noting that respondents could select multiple options. With the scenic cycling route available along the Swan River, recreational cycling is highly popular in the ToVP as reflected in the survey results.

A summary of the most common issues raised from the community survey regarding popular routes can be seen in Table 12-1. It should also be noted that the CoSP community survey also raised significant concern for the lack of separated cycle infrastructure and adequate lighting along McCallum Park and Burswood Park. Additionally, issues were raised at areas outside of the ToVP, including Centenary Avenue (City of Canning), highlighting the need for greater consistency across council borders.

The issues raised in the community survey have been used to influence and prioritise the recommended projects outlined in Section 15.

Table 12-1: Summary of issues raised regarding popular routes

Location	Issue/Concern	% of Comments
Albany Highway	- a desire for dedicated bicycle infrastructure (i.e. bicycle lanes) to provide adequate separation from turning and parked vehicles (i.e. dooring)	20%
	- cars often exceed the 40km/hr speed limit creating an intimidating road environment for cyclists	
	- lack of appropriate traffic calming measures and motorist awareness increases the probability of conflicts between cyclists and other modes of transport	
Rutland Avenue	- a desire for dedicated bicycle infrastructure (i.e bicycle lanes) and crossing facilities at cross-roads	15%
	- high traffic volumes and speeds contribute in creating an intimidating road environment for cyclists	
Shepperton Road	- a desire for dedicated bicycle infrastructure (i.e bicycle lanes)	6%
	- difficulty in crossing Canning Highway due to high traffic volumes, high traffic speeds and a lack of safe crossing points (i.e.narrow medians)	
Berwick Street	- a desire for an extension to bicycle infrastructure (i.e bicycle lanes) along the route to improve separation from buses and cars	6%
Causeway Bridge	- shared path is too narrow when considering high pedestrian and cyclist volumes creating an uncomfortable cycling environment	4%
Canning Highway	- a desire for dedicated bicycle infrastructure (i.e bicycle lanes)	3%
Manning Road	- high traffic volumes and speeds cause an intimidating on-road environment for cyclists	2%
	- lack of dedicated bicycle infrastructure (i.e bicycle lanes) for connections with Curtin University	
Roberts Road	- issues with general maintenance (i.e. glass) create an uncomfortable cycling environment	2%
Oats St	- a desire for dedicated bicycle infrastructure (ie. bicycle lanes) west of Shepperton Road, which currently end	2%
Centenary Avenue	- a desire for dedicated bicycle infrastructure (i.e bicycle lanes)	2%
	Total	**61%**

12.1.2 Online Mapping Tool

The ToVP interactive online mapping tool was open to the public from May 1st to June 9th 2017. The tool allowed members of the community to place pins on a map of the ToVP to comment on the following items:

- 'Bike Issue' (red pin) – may include locations where there are missing links, unsafe crossings, lights, or other issues relating to the cycling experience;
- 'I enjoy riding here' (green pin) – may include locations that are enjoyable to ride, have great end of trip facilities (i.e. bicycle parking, lockers, showers) or notable for other reasons; and
- 'Bike Idea' (yellow pin) – may include locations that are not necessarily unsafe or an issue, however would like to see an improvement.

Referring to Figure 12-3, a total of 184 pins were dropped on the mapping tool (noting that users could submit an unlimited number of pins). As shown in Figure 12-1 and Figure 12-2, almost the entire number of riders that contributed to the mapping tool were confident cyclists, for a range of riding purposes. Note that this captures the rider's perception of what the confidence level they see themselves. Future surveys should consider alternative ways to capture the views of riders of lower confidence level, which will assist in initiating greater mode shift towards cycling.

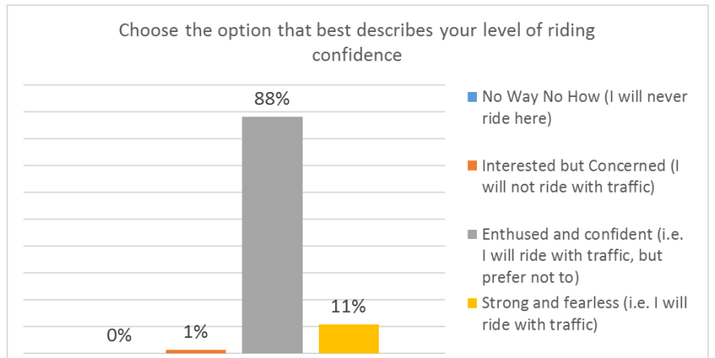


Figure 12-1: Online mapping tool respondents – level of rider confidence

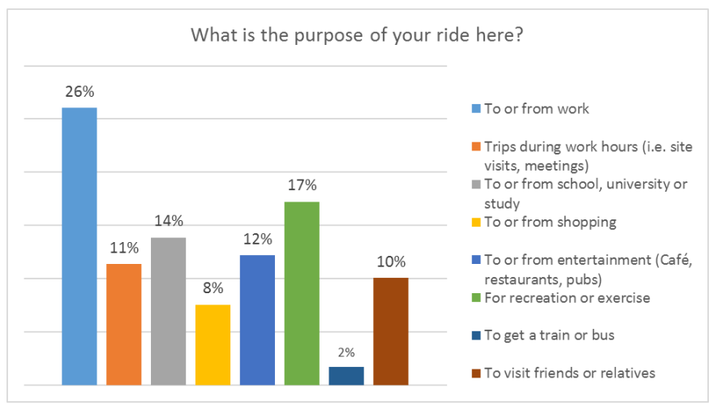


Figure 12-2: Online mapping tool respondents – purpose of ride at pin location

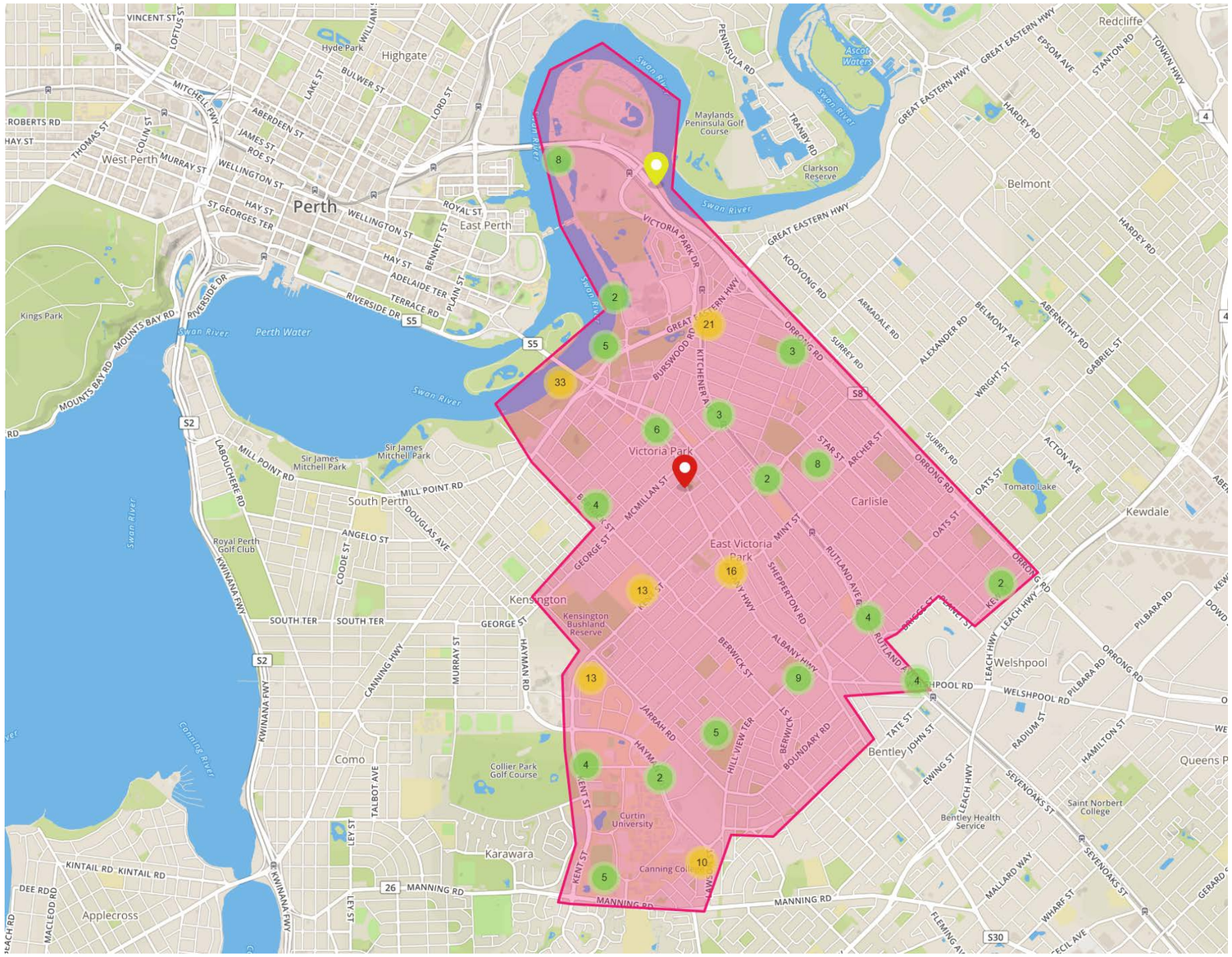


Figure 12-3: ToVP online mapping tool

The following summarises the key feedback provided from the online mapping tool:

Bike Issues (red pins)

1. Busy locations without adequate cyclist crossing facilities i.e. Manning Road at Curtin University South Entrance;
2. Lack of suitable off-road options for cyclists along key routes, and existing cycle facilities often discontinue i.e. Marquis Street;
3. Intersections with high traffic without cycle infrastructure i.e. Kent Street/ Berwick Street intersection;
4. Wayfinding is often inadequate i.e. for Curtin University to/from Kwinana Freeway; and
5. Debris and flooding along some off-road infrastructure i.e. Harold Rossiter Park shared path.

Bike ideas (yellow pins)

1. Reduce speed limit along some roads to increase safety for on-road cyclists i.e. Kent Street;
2. Increase the supply of separated facilities i.e. between pedestrian and cyclists, and cyclists and vehicles;
3. Provide a pump track facility within ToVP i.e. at McCallum Park;
4. Update signage to improve priority for cyclists i.e. 'No Entry, Buses and Taxis Excepted' at Adie Court/ Jarrah Road intersection; and
5. Increase the supply of Safe Active Streets throughout ToVP i.e. at Gloucester Street.

'I like riding here' (green pins)

1. Areas where there is separation from pedestrians and vehicles i.e. McCallum Park;
2. Cycle infrastructure which provides access to the areas natural attractions i.e. Swan River;
3. Roads with low traffic volumes i.e. Devenish Street; and
4. Areas with high visibility and the sense of security this provides.

The issues raised in the online mapping tool have been used to influence and prioritise the recommended projects outlined in Section 15.

12.1.3 Community Workshop

The ToVP community workshop was held on the 25th May 2017 in the ToVP. The community were invited to contribute ideas, report issues, prioritise and suggest improvements. Members of the community who were not able to attend the ToVP workshop were encouraged to attend the CoSP workshop which was facilitated in the same way.

The workshop followed a human centred approach where residents were invited to participate in interactive activities that placed the end user at the centre of the thought process. The aim of each activity was to understand the issues, needs and challenges that the community face regarding cycling. By the end of the evening residents could transform some of the key issues raised into real 3-dimensional solutions. The key issues and comments raised are detailed below.

Recreational Facilities

- Lack of public cycling events;
- Lack of facilities for children (i.e. completely separated from road environment);
- A desire for pump track facilities (i.e. at McCallum Park, Edward Millen House, Kent Street near Kensington Bushland); and
- Recreational facilities can act as a key facilitator for encouraging people to try cycling, which can lead to commuting uses in the future.

Infrastructure and Maintenance

- Intersections create an intimidating cycle environment (roundabouts and signalised);
- Poor and inconsistent signage and marking of bike lanes;
- Lack of consideration for cyclists at construction sites;
- Difficulty crossing on roads due to insufficient facilities (i.e. Shepperton Road, Rutland Avenue and Orrong Road);
- Insufficient width of shared path and uneven surface along the Causeway;
- Lack of space for cyclists along high traffic roads (i.e. Albany Highway, Oats Street and Berwick Street);
- Lack of dedicated cycle infrastructure on Canning Highway and Rutland Avenue;
- Traffic calming measures cause cyclists to exit road (i.e. Bishopsgate Street);
- Glass is often on footpaths;
- Rubbish bines are often left on paths and bike lanes, impeding cyclist movement; and
- Great Eastern Highway overpass/footbridge is very narrow.

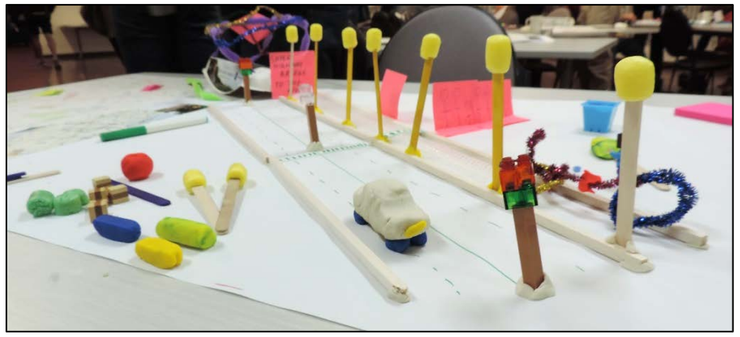


Figure 12-4: Road concept with separated cycle lanes

Education and Behaviours

- Lack of knowledge of road rules from drivers;
- Antisocial and inconsiderate driving behaviours by drivers to cyclists (i.e. at roundabouts, right of way);
- A desire for increased cyclist education (i.e. path etiquette, use of bells, high cycle speeds);
- A desire for increased pedestrian education for paths (cyclists can cycle on, dogs off-leash, general awareness for cyclists, use of headphones, walking 3 abreast); and
- A lack of understanding between all modes (pedestrians, cyclists and drivers) that we are people and as a community we need to show empathy rather than frustration.

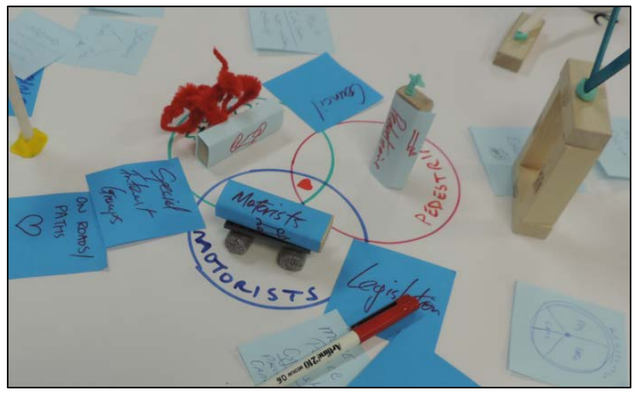


Figure 12-5: 'We are all human concept' for sharing facilities for all users

Connectivity

- Connectivity through Victoria Park is reliant on cycling on road;
- Lack of connectivity to Foreshore for all parts of Victoria Park;
- A desire for safer routes to schools;
- Lack of connection to public transport;
- Apparent pinch points at river, highway and train line crossings; and
- Difficulty with connection to Leach Highway PSP

Leadership and Implementation from Council

- Lack of service and information for cycling on the Council website;
- Engage with community to understand the most urgently needed initiatives/projects;
- Implement the previously planned projects for cyclists, particularly quick wins;
- Understand the benefits that active travel can have on the community and increase its priority on the council agenda;
- Be courageous and take risks with measures toward improving cycling in the council (i.e. lobbying for funding, innovative solutions); and
- Tougher enforcement on driver and parking laws.

The issues raised in the online mapping tool have been used to influence and prioritise the recommended projects outlined in Section 15.

12.2 Curtin University

A number of meetings were held with representatives from Curtin University and the Curtin University Bicycle User Group (CUBUG) in order to understand the current issues associated with cycling, and areas that should be considered in the Plan.

The following summarises the key comments:

- There is a lack of an east-west link through and external to the campus, i.e.
  - Canning Bridge to Curtin University; and
  - Armadale/Thornlie Rail Line to Curtin University.
- There is a need for improved infrastructure along key desired routes from Curtin University:
  - Douglas Avenue to South Perth Foreshore;
  - Kent Street to Albany Highway and ToVP train stations;
  - Manning Road to City of Canning train stations; and
  - Routes to Welshpool and areas south of Curtin University.
- There is a lack of cycle and pedestrian provisions at major intersections, particularly:
  - Main Street/Kent Street;
  - Main Street/Hayman Road;
  - Manning Road/Curtin University South Entrance; and
  - Kent Street/Hayman Road.
- Improvements are needed to wayfinding at existing routes, including:
  - Off-road connection between Jackson Road and Henley Street;
  - Banksia Terrace; and
  - Douglas Avenue/Lawler Street.
- A focus should be on connecting to the surrounding river foreshores, i.e.
  - Swan River; and
  - Canning River.
- Improved cyclist priority is required on shared paths that intersect with quieter side roads surrounding Curtin University, particularly on:
  - Hayman Road; and
  - Kent Street.
- Improved provisions for cyclists at signalised intersections is required, particularly:
  - Extended pedestrian crossing phasing at the Hayman Road/Main Street intersection; and
  - Installation of new pedestrian crossings at Manning Road/Kent Street and Manning Road/South Entrance intersections.
- Consistent and integrated cycle infrastructure is needed amongst surrounding council areas, particularly:
  - CoSP; and
  - City of Canning.
- Reduction in speed limits is required to create a safer on-road environment for cyclists, particularly at:
  - Hayman Road; and
  - Kent Street.
- There is the potential for a premier statement piece for pedestrians and cyclists at the Kent Street/Hayman Road intersection, which currently provides poor priority i.e. a suspended pedestrian/cyclist roundabout above the intersection similar to the Hovenring in the Netherlands.
- There is the potential to incorporate more bicycle infrastructure as public art to increase awareness and attractiveness of cycling to Curtin University.
- Improved wayfinding leading to the campus is required which is unique and effective but still integrated with the surrounding network.

13 Bicycle Network and Facilities

13.1 Existing Infrastructure Audit

A number of cycle routes traverse the ToVP, many of which have been developed over time through the implementation of the 1996 Perth Bicycle Network Plan and WA Bicycle Network Plan (DoT, 2014-2031). The existing network exists of various types of bicycle infrastructure, including off-road separated and shared paths and on-road cycle lanes. A map of the existing bicycle facilities in the ToVP is shown in Figure 13-1.

In the development of this Plan, the existing bicycle routes have been re-evaluated in light of the State Government's Perth Transport Plan at 3.5 million. As such, an assessment of the existing bicycle network was undertaken with consideration of the routes identified in the Perth Transport Plan at 3.5 million.

The study area was divided into 'links' – a small or complete section of cycle path, on-road facility or roadway. A total of 20 links were assessed on a saddle survey throughout the ToVP.

The assessment of each link was undertaken using the criteria outlined in the Transport Research Laboratory (TRL) Street Audit Network software package (Cycling Component - CERS), as shown in in Table 13-1.

Table 13-1: CERS assessment parameters

Category	Parameters
Convenience	Continuity
	Legibility
	Directness
Accessibility / Safety	Worst Intersection Conflict Point
	Traffic Volume
	Traffic Proximity
	Traffic speed
	Link Conflict Points
Comfort	Effective width
	Surface Quality
	Maintenance
	Overall Effort
Attractiveness	Personal security
	Lighting
	Quality of Environment

13.1.1 Link Rating

The following steps were employed to assess each link.

Step 1 – Identify start and termination point of link

1. Determine individual link lengths of all bicycle routes (this includes the division of routes / corridors);
2. Check each link length logically using data collected on site for suitability; and
3. Assign name and identification reference code for each link.

Step 2 – Check data availability of route

1. Traffic data – Gather from available Main Roads data or estimate based on the road hierarchy and onsite observations. The traffic data available for the audited links is shown in Figure 13-2;
2. Traffic speeds – Note the on-street posted speed limit and determine whether or not the traffic speed on-site is commensurate; and
3. Terrain – From site visits, gather an indication of the terrain (uphill or downhill grade) along the link.

Step 3 – Intersections

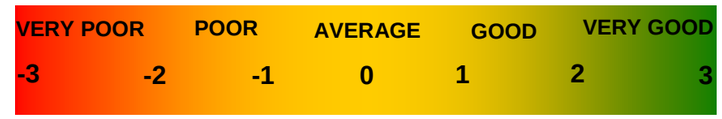
1. Once link length is established, note all types of intersections along the extent of the link; and
2. Highlight the worst performing intersection based on desktop assessment, onsite observation and professional judgement.

Step 4 – On site evaluation

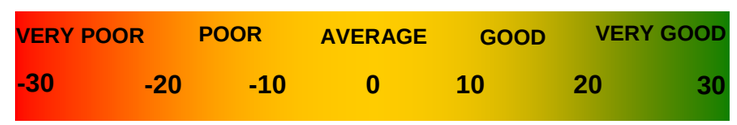
1. Undertake site visits to complete the audit assessment, ensuring all parameter fields are completed (refer to Table 6-2);
2. Where necessary add comments which substantiate scoring decisions or any other relevant information for future reference;
3. Total score for the link will be automatically assigned on completion of all parameters; and
4. Add any relevant conclusions for each link for future reference.

During the assessment of each link, each parameter was manually scored on a range from **-3** to **+3**, where **+3** is the highest score and **-3** the lowest. For a parameter to warrant a score of **+3**, it would need to be exemplary and of a standard identified as best practice. The scores were therefore allocated on a range from very poor to optimum with **0** representing an average score:

The scoring scale is set out below:



An overall score for each link was determined, giving a general indication of how well the route caters for cyclists. Generally, any link that scores above 10 is considered good, a link that receives a score between -10 and 10 is average and a link scoring below -10 is a poor link. The scoring scale for the overall score is shown below:



13.1.2 Audit Findings

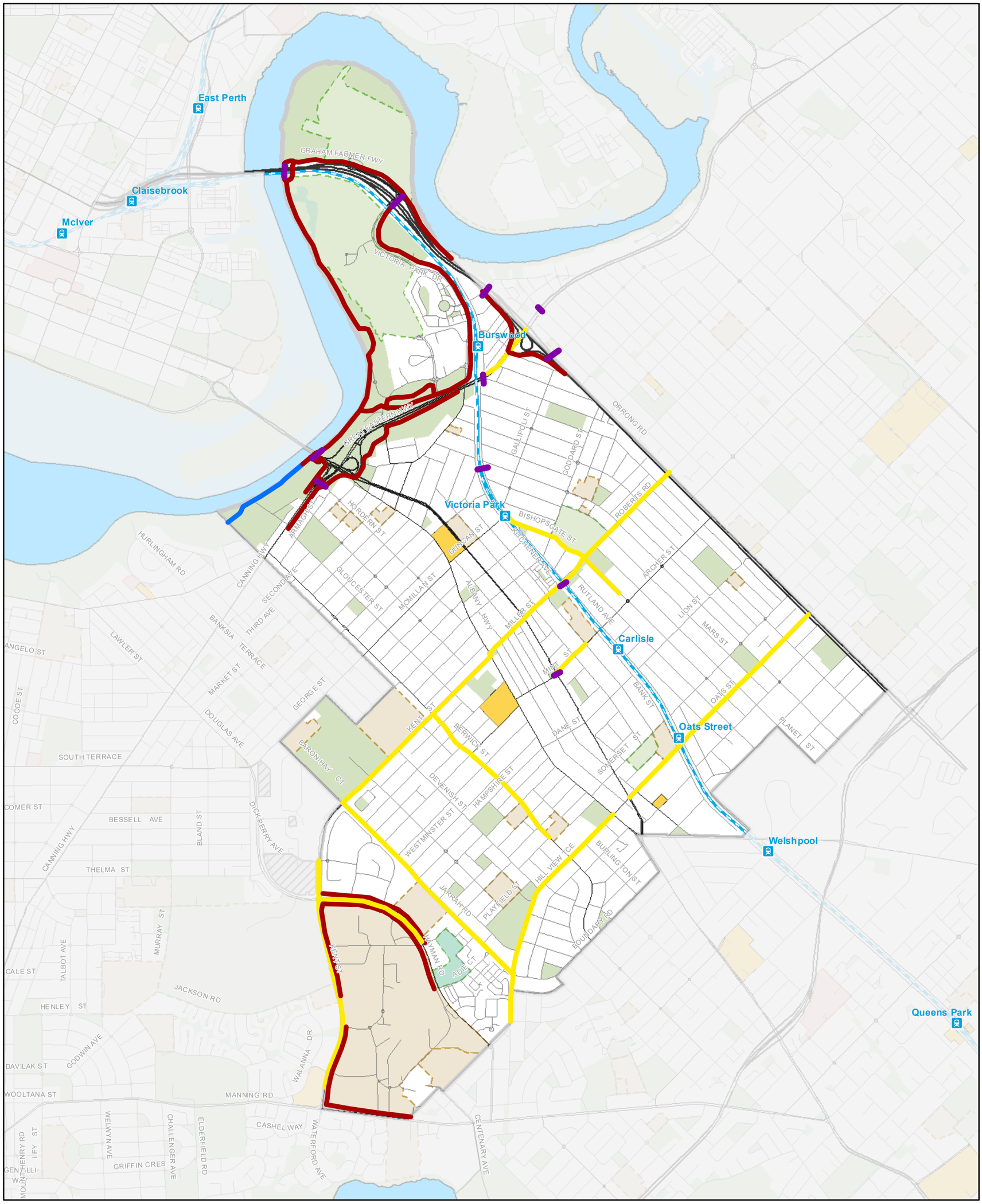
The detailed findings of the infrastructure audit, along with an action plan for each individual link is presented in Appendix E with each link described in terms of:

- Assigned link number;
- Scored colour code;
- Link name;
- Link description;
- Photo inventory;
- Issues identified; and
- Suggestions for improvements.

The suggestions highlighted in Appendix E are intended to be included in the ToVP maintenance team's work packages for when each specific link is next scheduled for maintenance (unless stated otherwise as a proposed project). It is important to note that there are many cases within the Town where existing unsigned sealed shoulders have previously been considered as appropriate for cyclists, however these do not meet the minimum requirements for cycle lanes as defined by the Road Traffic Code and appropriate guidelines. As such, there should be a long term focus on upgrading existing cycle infrastructure in line with the minimum requirements as described in Section 1.3.

The general performance of all the audited links are shown in Figure 13-3, where it can be seen that routes with protected cycling infrastructure and low traffic volumes generally outscored those where cyclists are left to mix with high traffic volumes.

A high level map summary of the proposed recommendations for all the audited infrastructure can also be found in Appendix E ("Infrastructure Audit Summary for ToVP"). The recommendations outlined on this map can be considered when any of the cycle routes are due for resurfacing or opportunities for works in those areas arise.



Legend

- Rail Stop
- Railway
- Separated Path (Bikes Only)
- High Quality Shared Path (Bikes and Pedestrians)
- Bicycle Lanes or Sealed Shoulders
- Safe Active Street
- Overpass/Underpass
- Existing Overpass/Underpass
- LGA Boundary (Town of Victoria Park)
- Shopping Area
- Community Facility
- Hospital Facility
- Education Facility
- Recreational Facility
- Recreational Park or Reserve
- Reserve (Miscellaneous & Other)

0 1 2 km

ToVP Figure 13-1 Existing Bicycle Facilities in the ToVP

Revision: 1	Project No: 255909	Date: May 2018
Prepared: S.Richards	Checked: M.LaGalia	Approved: M.LaGalia
Coordinate System: GDA 1994 MGA Zone 50		Scale @ A3: 1:27,000

Source: © Landgate 2017, Main Roads WA

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Client: Town of Victoria Park, City of South Perth

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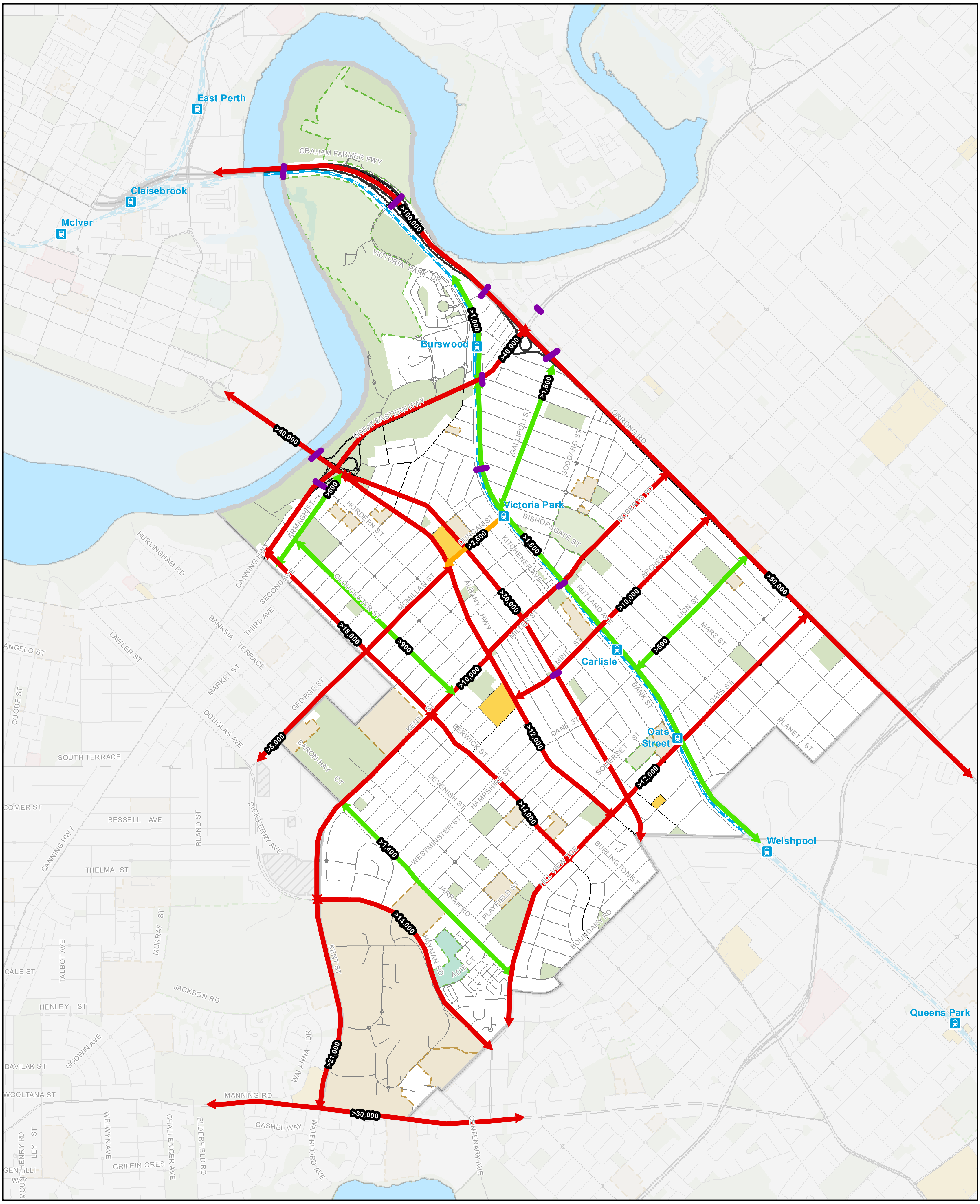
Table 13-2: CERS assessment framework

Category	Parameters	What to assess
Convenience	Continuity	Any issues that may affect the continuity if a facility were to be introduced This could include change in carriageway width, or delay to cyclists (e.g. through signalised intersections)
	Legibility	Issues that may affect a cyclist's ability to follow the route Take note of any existing cycle / traffic signs that provide directions and any landmarks
	Directness	Ascertain if the proposed link is the most direct path with no delays Use site inspections, internet based maps and photography was used to ascertain if there is an alternative route which cyclists could use Take into account intersections or other features that may result in delay
Accessibility / Safety	Worst Intersection Conflict Point	Based on the type of intersection in combination with traffic flow and the size of the intersection Those intersections with fewer potential conflict points are awarded a greater score Ascertained using provided traffic data, collision data and site inspections/ internet based maps
	Traffic Volume	Use existing data for assessment purposes. Those roads with a lighter traffic flows will receive a high score
	Traffic Proximity	Based on mixture of traffic and width of traffic lane(s) in a single direction of travel A wide lane with cars only will provide a higher score than a narrow roadway which routinely accommodates buses or other large vehicles
	Traffic speed	Use recorded 85th percentile speeds or if unavailable posted speed limit signage The lower the speed of vehicular traffic the higher the score
	Link Conflict Points	Includes obstructions along the route carriageway surface Whether visibility is restricted due to roadside furniture, vegetation etc. Considers the presence and frequency of private access points (driveways etc.)
Comfort	Effective width	Assess any existing cycle lane provision Assess the entire width of the carriageway (to include possible effect of overtaking) Make note of parked cars; this will determine what measures may be required to remove parking or whether a cycle lane away from the edge of the carriageway could be introduced
	Surface Quality	Observe quality of road surface and type, i.e. cracking, potholes, cobblestones etc. Observe any skid / fall hazards such as gully gratings, service chamber covers etc. Observe number of reinstatements and quality.
	Maintenance	Assess current drainage facilities and whether drainage channels appear to be free from detritus and regularly swept Identify any areas where ponding of water is evident; large areas of standing water will deter cyclists and alter their path, a particular issue on signed only routes where there is no designated lane Assess quality of road markings to determine clarity – will affect vehicular paths and therefore behaviour through intersections and along routes Provides an indication of the future score of maintenance if not addressed
	Overall Effort	Make note of the gradient of the link to determine the effort cyclists would need to make to negotiate links. Especially problematic if cyclists are required to stop, e.g. at intersections, pedestrian crosswalks, and need to restart
Attractiveness	Personal security	Determine whether the area around the link has litter / graffiti or evidence of vandalism as cycling demand can be suppressed through fear of crime Make a note of the presence of any CCTV cameras in the vicinity Identify any areas of concealment adjacent to the proposed route
	Lighting	Make note of the regularity and positioning of lighting columns to determine the lighting levels during the hours of darkness Lighting should be available on cycle routes as a safety measure and to provide an additional level of personal security
	Quality of Environment	Determine the quality of the property frontages along the link, is this a route that cyclists would want to navigate? Are the frontages and fence lines etc. of good quality and well maintained? The presence of trees / vegetation will make the route more appealing to cyclists. Is regular maintenance likely to occur?



Legend

- Rail Stop
- Railway
- Freeway
- Highway
- Main
- Minor
- Overpass/Underpass
- Existing Overpass/Underpass
- Existing Traffic Volumes (Vehicles Per Day)
  - <2000
  - 2000 - 5000
  - >5000
- LGA Boundary (Town of Victoria Park)
- Shopping Area
- Community Facility
- Hospital Facility
- Education Facility
- Recreational Facility
- Recreational Park or Reserve
- Reserve (Miscellaneous & Other)

0 1 2 km

ToVP Figure 13-2 Existing Traffic Volumes in the ToVP

Revision: 1	Project No: 255909	Date: May 2018
Prepared: S.Richards	Checked: M.LaGalia	Approved: M.LaGalia
Coordinate System: GDA 1994 MGA Zone 50		Scale @ A3: 1:27,000

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Client: Town of Victoria Park, City of South Perth

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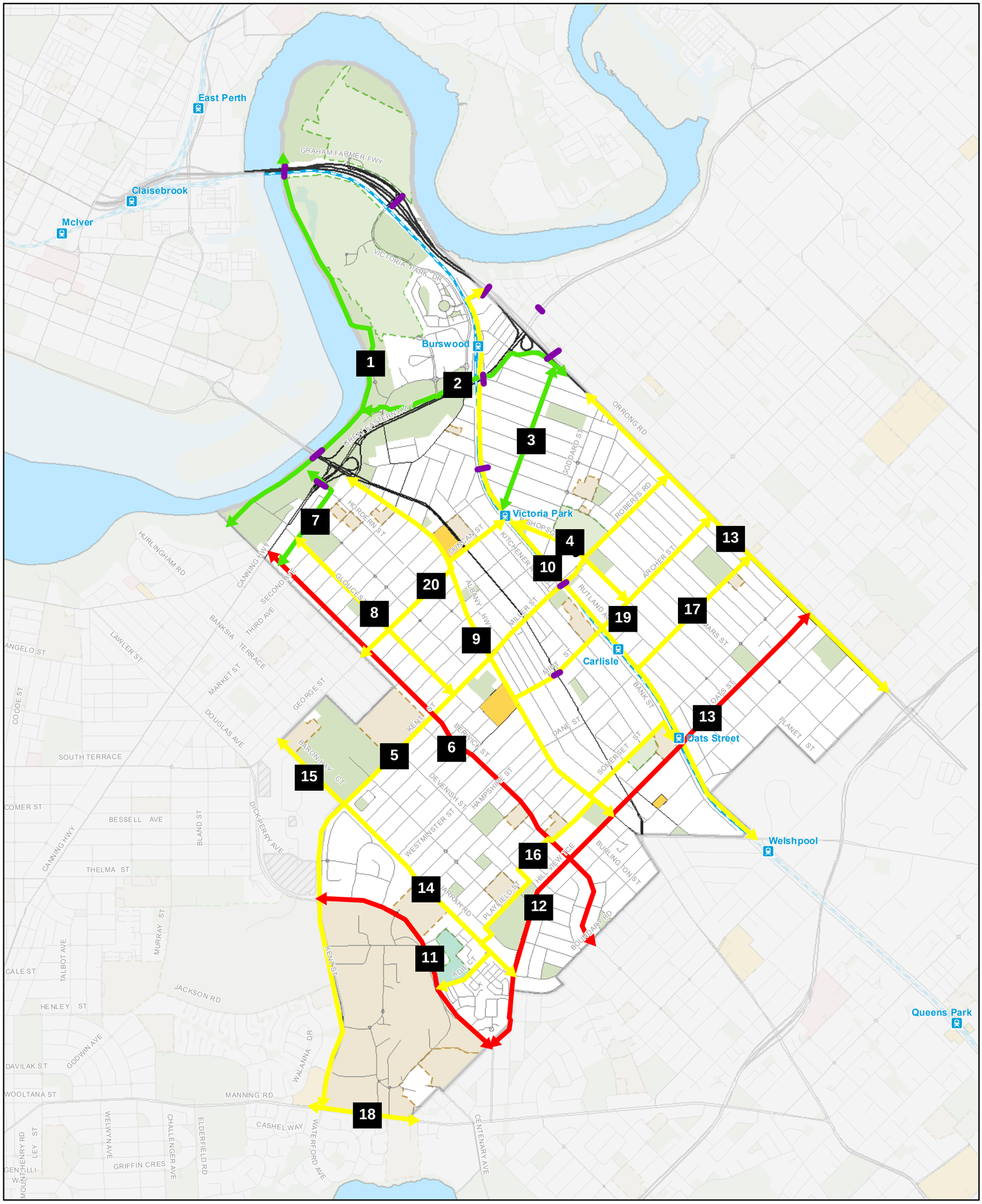

Legend

- Rail Stop
- Railway
- Audited Links
  - Poor
  - Good
  - Average
  - Overpass/Underpass
  - Existing Overpass/Underpass
- LGA Boundary (Town of Victoria Park)
- Shopping Area
- Community Facility
- Hospital Facility
- Education Facility
- Recreational Facility
- Recreational Park or Reserve
- Reserve (Miscellaneous & Other)

0 1 2 km

ToVP Figure 13-3 Audited Links and Corresponding Performance for the ToVP

Revision: 1	Project No: 255909	Date: May 2018
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Coordinate System: GDA 1994 MGA Zone 50		Scale @ A3: 1:27,000

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Client: Town of Victoria Park, City of South Perth

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14 Aspirational Cycle Network

It is suggested that the ToVP bicycle network consist of a range of routes that traverse the Town and provide access to various land uses. The routes should range from many local routes to fewer secondary and primary routes aimed at providing efficient through movement for commuter cyclists.

The cycle network should be in line with DoT's hierarchy as part of the Perth Transport Plan @3.5million and wherever possible ToVP should be actively involved in influencing the strategy as it pertains to Victoria Park. It should further be considered that the transport network needs of cyclists, with a destination in mind, are exactly the same as motorists travelling to a destination. This includes the need to include direct and efficient routes, and for this reason the network is similar to the general traffic network.

The overall cycle network is shown in Figure 14-2, and is intended to be **aspirational**– i.e. the long term vision of what the cycle network within the ToVP endeavours to look like by the time Perth's population grows to 3.5 million (towards the year 2050). The proposed aspirational cycle network outlines several ambitious routes aimed at making cycling a realistic and appealing option for a high proportion of the population. The aspirational cycle network has been influenced by the routes identified in the Perth Transport Plan for 3.5 million and the research, investigation and consultation undertaken as part of the project.

The proposed network is based on the DoT cycling route hierarchy, which comprises of three tiers – Primary Routes, Secondary Routes and Local Routes.

14.1.1 Primary Routes

Primary Routes typically consist of high quality shared paths that are located along major road and rail corridors and ocean and river foreshores. Principle routes aim to avoid interruptions to cyclists with consideration to separation of pedestrians and cyclists at areas of high pedestrian activity, and grade separation at major intersecting roads and railways.

It is proposed that these Primary Routes include:

- Rutland Avenue; and
- Burswood Foreshore.

14.1.2 Secondary Routes

Secondary Routes are typically located on corridors situated within urban or built-up environments. Secondary Routes provide safe and direct connections between Primary Routes and major trip generators such as shopping centres, industrial areas, major health and educational institutions, sporting and civic facilities. Secondary routes can take the following forms:

- Fully protected on-road bicycle lanes;
- On-road bicycle lanes separated from traffic with "soft" measures such as painted hatching, plastic kerbing or armadillos;
- Shared paths within verges to allow access to shops and businesses; and
- Occasionally a Safe Active Street environment may be appropriate.

It is proposed that these Secondary Routes include:

- Hill View Terrace/Oats Street;
- Kent Street/Miller Street/Roberts Road;
- Hayman Road;
- Berwick Street;
- Gloucester Street;
- Orrong Road; and
- Great Eastern Highway shared path (via Burswood).

14.1.3 Local Routes

Local Routes are typically located in local areas (i.e. residential). The purpose of local routes is to collect cycling traffic from local roads within towns and suburbs and distribute it to the secondary and primary networks. Local routes can take the following forms:

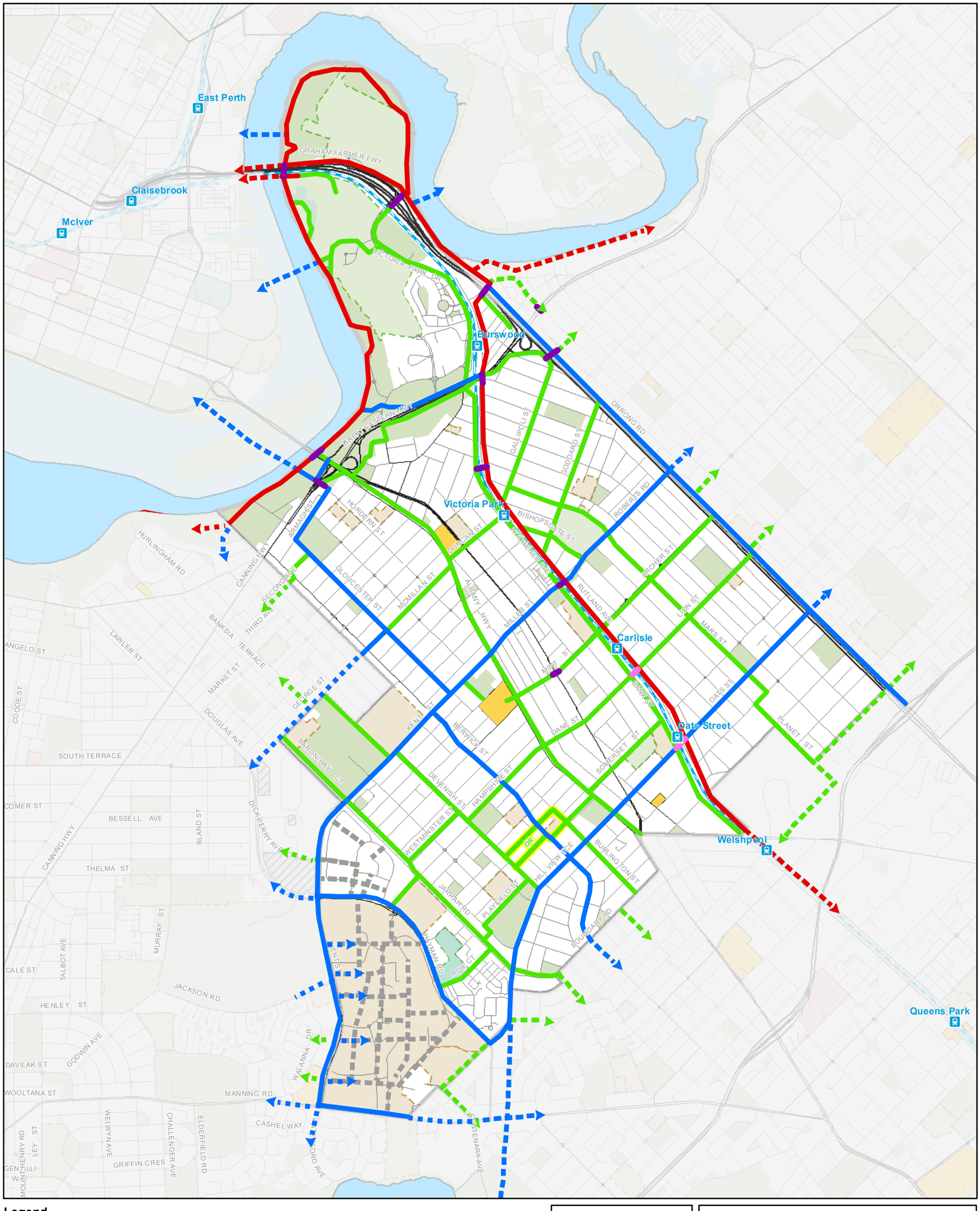
- 30km/hr Safe Active Streets which adopt "self-explaining street" and "filtered permeability" urban design principles;
- Very quiet suburban streets, communicated using sharrows or appropriate signage/way finding;
- Short sections of shared path; and
- Occasionally, on road cycle lanes on quiet roads (less than 50km/h) may be appropriate.

It is proposed that these Local Routes include:

- Connections to Perth Stadium;
- Victoria Park Drive;
- Great Eastern Highway shared path (via Charles Patterson and G.O Edwards Park to Orrong Road Overpass);
- Great Eastern Highway to Riversdale Road shared path;
- West side of Rail Line (Kitchener Avenue and Bank Street);
- Gallipoli Street;
- Goddard Street;
- North south industrial route from Gallipoli Street to Kew Street (via McCartney Crescent, Mars Street, Cohn Street and Planet Street);
- Bishopsgate Street;
- Albany Highway;
- Colombo Street;
- McMillan/Duncan Street;
- John McMillan Park Shared Path;
- Mint/Archer Street;
- Dane Street/Hampshire/Westminster Street through to Hayman Road (via TAFE Campus);
- Lion Street/Asteroid Way/Apollo Way/Solar Way/Gemini Way/Galaxy Way;
- Cycle Ring Route between Hayman Road and Oats Street Station;
- Harold Rossiter Park;
- Baron-Hay Court;
- Jarrah Road/Boundary Road; and
- Burlington Street.

Figure 14-1: Route hierarchy example infrastructure (source: DoT)

It should be noted that the DoT Hierarchy also includes Long Distance Trails and Training Circuits, although these are not applicable to CoSP.



Legend

- Rail Stop
- Railway
- Freeway
- Highway
- Main
- Minor

Aspirational Network

- Principal Route
- Principal Route - by others
- Strategic Routes
- Strategic Routes - by others
- Local Routes
- Local Routes - by others
- Within Curtin University

Overpass/Underpass

- Existing Overpass/Underpass
- Proposed Overpass/Underpass
- LGA Boundary (Town of Victoria Park)

- Shopping Area
- Community Facility
- Hospital Facility
- Education Facility
- Recreational Facility
- Recreational Park or Reserve
- Reserve (Miscellaneous & Other)

0 1 2 km

ToVP Figure 14-2 Aspirational Cycle Network for the ToVP

Revision: 1	Project No: 255909	Date: May 2018
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Coordinate System: GDA 1994 MGA Zone 50		Scale @ A3: 1:27,000

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Client: Town of Victoria Park, City of South Perth

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15 Projects and Prioritisation

15.1 Prioritisation Process

As a result of the research, investigation and consultation undertaken as part of the project, several potential infrastructure projects were identified and shortlisted for inclusion in the **5-year implementation plan**.

A process was then undertaken to provide an indication of the priority with which the ToVP should aim to implement the infrastructure projects. It should be noted that the prioritisation process is subjective and is intended to provide guidance only. Opportunities may arise over the implementation of this Plan which may fast track or hinder the progress of projects.

Prioritisation of Bicycle Infrastructure Proposals, published by the Australian Bicycle Council and the federal Department of Infrastructure, Transport, Regional Development and Local Government, provides guidance on the prioritisation of bicycle facilities. It also suggests a list of criteria for assessing proposed bicycle facilities. These are listed in the form of six objectives which are outlined below:

1. **Public Consultation**

   Consideration of stakeholder concerns and the impact that the project may have on alleviating issues.

2. **Strategic**

   Consideration of how the project fits into the long term aspirational cycle network.

3. **Connectivity**

   Consideration of how the project may impact accessibility to the following destinations and facilities:

   a. Schools;

   b. Tertiary institutions;

   c. Recreational and tourism facilities;

   d. Employment zones; and

   e. Public transport hubs.

4. **Economic**

   Consideration of how the project may impact the following:

   a. Mode shift – refers to the potential to encourage mode shift away from the private vehicle;

   b. Impact on motor vehicles – refers to the potential impact on private vehicle trips (i.e. journey times); and

   c. Impact on accessibility to commercial facilities.

5. **Safety**

   Consideration of how the project impacts general safety of the following users:

   a. Cyclists; and

   b. Pedestrians.

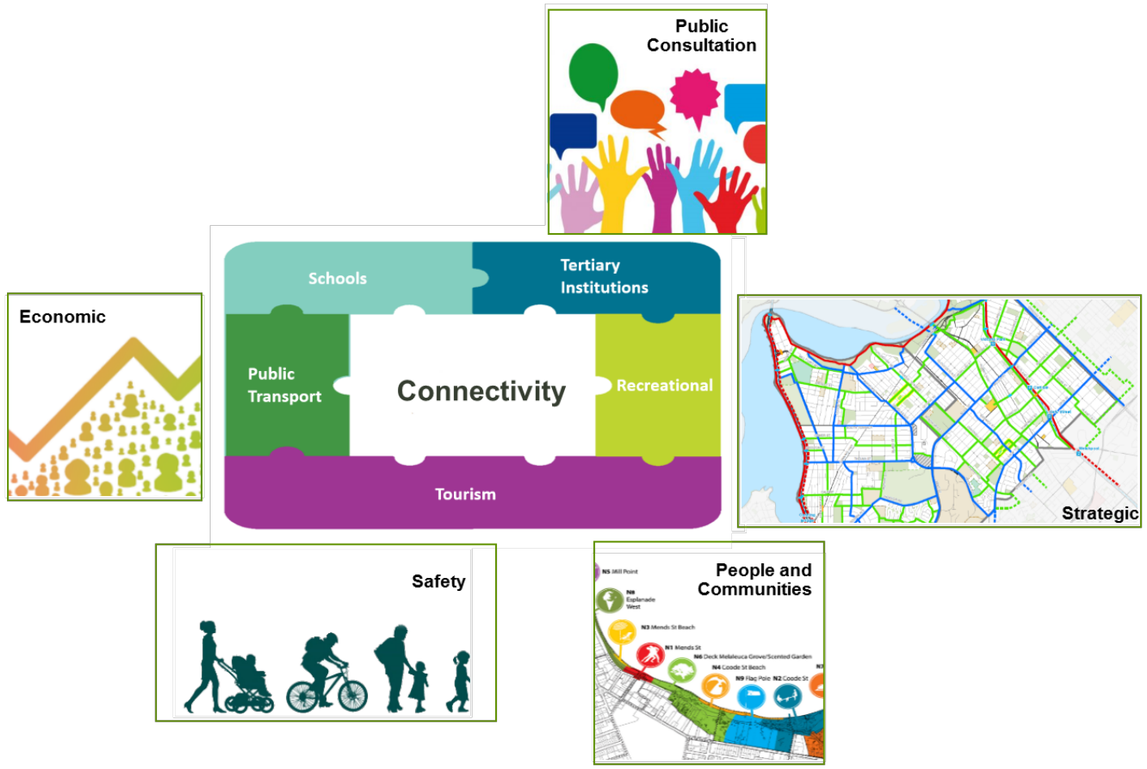
6. **People and Communities**

   Consideration of the how the project impacts the following:

   a. Level of service – refers to the quality or 'bicycle friendliness' of the route, including factors such as coherence, comfort and convenience; and

   b. Townscape/urban planning – refers to how the proposed project fits into an overall town plan.

Prioritisation of Bicycle Infrastructure Proposals further suggests that the above criteria be used as part of a multi-criteria analysis (MCA). Therefore, in order to prioritise the proposed infrastructure projects, the broad qualitative impact of each proposal was identified under each of the above six objectives.



A score was then assigned for each objective for each project, with the following weightings applied:

- Public Consultation: 20%
  - For the purpose of this study, the total number of comments from both the community survey and the stakeholder consultation were counted, and then grouped into a range for assessment.
- Strategic: 25%
- Connectivity: 25%
- Economic: 5%
- Safety: 15%
  - This criterion takes into consideration the number of crashes that occurred on the proposed route.
- People and communities: 10%

The sum of these individual scores yielded a total score for each proposal out of 10. The priority level of each proposal was then assigned using the total score, as follows:

- 7.0 -10.0: high priority
- 5.0 – 6.99: medium priority
- ≤ 5.0: low priority

15.2 Infrastructure Project List

A total of six cycling infrastructure projects are proposed within the ToVP over the next 5-years. High level order of cost estimates have been determined for these projects (further details in Section 16), however further investigation will need to be undertaken to develop detailed concepts and understand the true cost of each project. Funding assistance from other agencies, such as the DoT, will need to be explored during implementation of the Plan.

The detailed project sheets for ToVP, including project justification, prioritisation ratings and indicative costs are provided in Appendix F.

A description of the ToVP prioritised project list provided in this section, and shown in Figure 15-1. The implementation of these projects will be dependent on further investigation and community consultation.

There may be situations where the removal of vegetation may be required to facilitate an improved cycling outcome, and as such it is recommended that any affected vegetation is replaced. As an example, some vegetation can affect sight lines, which could be replaced with the appropriate plant species or ground vegetation.

Table 15-1: Summary of prioritised infrastructure project list for the ToVP

#	Project Name	Location	Description	Public Consultation	Strategic	Connectivity	Economic	Safety	People & Communities	Weighted Total / 10	Estimated Cost*
1	Rutland Avenue Project	Between Welshpool Road and Riversdale Road	This project is split into four stages. For stages 1 and 2, install a 3m wide raised high quality shared path on the west side of Rutland Avenue between Welshpool Road and Oats Street, and Oats Street and Bishopsgate Street. Convert Rutland Avenue to a Bicycle Boulevard/Safe Active Street between Bishopsgate Street and Streatley Avenue (Stage 3) and install a 3m wide raised high quality shared path on the west side of Goodwood Parade between Great Eastern Highway and Riversdale Road (Stage 4). Stage 1 is currently scheduled for construction in the 2017/18 financial year and concept designs have been completed for stages 3 and 4. Stage 2 is considered the lowest priority.	8	10	7.6	6.67	10	10	**8.83**	$2,300,000.00
2	Kent Street Project	Between Manning Road and Orrong Road	This project is split into four stages. For Stage 2A, upgrade the missing gaps of high quality shared path on the east side of Kent Street to a 2.5m-3.0m shared path between Manning and Hayman Road and Hayman and Jarrah Road. Also as part of Stage 2A, investigate the reduction of the posted speed limit to 60km/h, and improve the on-road cycle lanes. Between Jarrah Road and Gloucester Street, formalise the existing shared path on the north side, and improve the on-road cycle lanes (Stage 2B). From Gloucester to Bishopsgate Street, upgrade the existing path to a 2.5m-3.0m high quality shared path on the southern side and improve the on-road cycle lanes (Stage 2C). Stage 2D includes upgrading the existing footpath to a 2.5-3.0m high quality shared path on the southern side, improving on-road cycle lanes and installing a pedestrian/cyclist crossing at Orrong Road.	8	8	8.2	5.33	9	8	**8.07**	$1,500,000.00
3	Albany Highway Investigation	Between Canning/Great Eastern Highway and Welshpool Road	Undertake an investigation to determine the feasibility of reallocating parking and installing a bi-directional cycle path on one side of Albany Highway. In the interim, investigate the reduction of the posted speed limit to 30km/h, install additional traffic calming measures and install cycle awareness signage and pavement markings to create a more cycle friendly environment.	8	6	7.2	5.33	10	10	**7.67**	$100,000.00
4	Gloucester Street Project	Gloucester Street (between Kent Street and Armagh Street) and Armagh Street (between Gloucester Street and Hordern Street)	Convert Gloucester Street and Armagh Street to a Safe Active Street/Bicycle Boulevard connecting from Kent Street to the Hordern Street underpass. This includes reversing directional priority at a number of intersections to improve cyclist priority. Install a 3.0m high quality shared path connection from Kent Street to the Park Shopping Centre and revitalise the Hordern Street underpass.	4	8	6	6.00	10	10	**7.10**	$1,300,000.00
5	Oats Street Project	Between Albany Highway and Orrong Road	Install 1.5m continuous marked on-road cycle lanes on Hill View Terrace (between Holder Street and Boundary Road) and Oats Street (between Albany Highway and Shepperton Road). Upgrade the existing on-road cycle lanes for the remainder of the route including the installation of advanced stop cycling boxes at intersections.	4	8	7.4	4.00	8	8	**6.85**	$1,000,000.00
6	Hayman Road Project	Between Kent Street and Marquis Street	Install a new 3.0m high quality shared path on the eastern side of Hayman Road and upgrade the existing footpath on the west side from Adie Court to Marquis Street to a 3.0m high quality shared path. Install a pedestrian/cyclist crossing at Brodie Hall Drive and investigate improving crossing priority for cyclists at the Hayman Road/Allen Court/Curtin Main Street signalised intersection.	4	8	5.4	2.67	9	9	**6.53**	$450,000.00

*High level order of cost estimates have been determined for these projects, however further investigation will need to be undertaken to develop detailed concepts and understand the true cost of each project

East Perth
Claisebrook
McIver
Burswood
Victoria Park
Carlisle
Oats Street
Welshpool
Queens Park
GRAHAM FARMER FWY
VICTORIA PARK DR
SRN EASTERN HWY
ORRONG RD
GALLIPOLI ST
GODDARD ST
ROBERTS RD
BISHOPSGATE ST
ARCHER ST
RUTLAND AVE
LION ST
MARS ST
OATS ST
PLANET ST
BANK ST
SOMERSET ST
DANE ST
BERWICK ST
HAMPSHIRE ST
DEVENISH ST
WESTMINSTER ST
HILL VIEW TCE
BURLINGTON ST
PLAYFIELD ST
JARRAH RD
BOUNDARY RD
HAYMAN RD
ADIE CT
KENT ST
ALBANY HWY
MILL ST
MINT ST
MCMILLAN ST
HORDERN ST
ARTHUR ST
GLOUCESTER ST
CANNING HWY
SECOND AVE
THIRD AVE
BANKSIA TERRACE
LAWLER ST
MARKET ST
GEORGE ST
DOUGLAS AVE
BARON HAY CT
SOUTH TERRACE
COMER ST
BESSELL AVE
BLAND ST
DICKBERRY AVE
THELMA ST
MURRAY ST
TALBOT AVE
CALE ST
JACKSON RD
HENLEY ST
GODWIN AVE
DAVILAK ST
WOOLTANA ST
MANNING RD
WALANNA DR
CASHEL WAY
WATERFORD AVE
CENTENARY AVE
ELDERFIELD RD
CHALLENGER AVE
WELWYN AVE
GRIFFIN CRES
HURLINGHAM RD
ANGELO ST
COODE ST
1
2
3
4
5
6

Legend

- Rail Stop
- Railway

Prioritised Proposed Projects
- Separated Path (Bikes Only)
- High Quality Shared Path (Bikes and Pedestrians)
- Bicycle Lanes or Sealed Shoulders
- Safe Active Street
- LGA Boundary (Town of Victoria Park)

1 ToVP Prioritised Project
- Prioritised Project 1
- Prioritised Project 2
- Prioritised Project 3
- Prioritised Project 4
- Prioritised Project 5
- Prioritised Project 6
- Prioritised Project 7

- Shopping Area
- Community Facility
- Hospital Facility
- Education Facility
- Recreational Facility
- Recreational Park or Reserve
- Reserve (Miscellaneous & Other)

0 1 2 km

ToVP Figure 15-1 Infrastructure Project Locations for the ToVP

Revision: 1	Project No: 255909	Date: May 2018
Prepared: S.Richards	Checked: M.LaGalia	Approved: M.LaGalia
Coordinate System: GDA 1994 MGA Zone 50		Scale @ A3: 1:27,000
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Client: Town of Victoria Park, City of South Perth		

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1 Rutland Avenue Project

Rutland Avenue is a primary route along the Perth-Armadale rail line, where there is currently a significant gap. Consultation has previously been undertaken regarding the various stages of Rutland Avenue. Each proposed stage is briefly summarised below:

- Stage 1: Rutland Avenue – Welshpool Road to Oats St
  - This project is proposed to consist of a new 3m wide raised path. Crossing of Oats Street is also proposed to be provided.
- Stage 2: Rutland Avenue – Bishopsgate Street to Oats Street
  - This is the middle section of the missing Rutland Avenue link but was deemed the lowest priority section by cycle workshops held in late-2016. The project is proposed to consist of a new 3m wide raised path on rail side.
- Stage 3: Rutland Avenue – Streatley Road to Bishopsgate Street
  - It is proposed to develop this section into a safe active street by reducing the posted speed limit to 30km/h, formalising on-street parking and installing pavement marking.
- Stage 4: Goodwood Parade – Great Eastern Highway to Riversdale Road
  - This project is proposed to consist of a new 3m wide raised path on the west side Goodwood Parade.

As part of each stage, consideration of adequate cycle crossing facilities is required with intersecting roads (i.e. Mint Street and Oats Street), including adequate median storage and holding rails.

2 Kent Street Project

Kent Street/Miller Street/Roberts Road is a key strategic route of approximately 6km that connects multiple key destinations including Curtin University, Kent Street Senior High School, the Leisure Life Centre, Albany Highway commercial precinct and Lathlain Park.

Most of the route has sealed shoulders available that disappear at some intersections. A wide off-road path is available in parts however it is generally inconsistent.

It is proposed that on-road cycle lanes are formalised along the entire route, along with improvements to various intersections to provide continuity for cyclists. On-road cycle lanes will cater for confident cyclists, however a key aspect of the Plan is to encourage increased cycling for less confident cyclists. It is therefore proposed that a continuous off-road shared path is reinforced along the entire length of the route.

Kent Street is partly under the control of CoSP (south of Jarrah Road), with modifications proposed as part of the CoSP infrastructure project list. As such, the Kent Street project should be undertaken jointly with the CoSP to ensure consistency.

During the implementation of the Kent Street project, supplementary initiatives should be incorporated to support behaviour change and encourage cycling. This should include wayfinding signage, bike parking and amenities and awareness campaigns (discussed in Section 15.5). In addition, it is proposed that a bike share scheme is trialled once the project is completed, in liaison with Curtin University and the ToVP (discussed in Section 15.5.5).

The proposed cycle route involves improved cycle infrastructure spanning across the following road sections:

- **Section 2A:** Kent Street (between Manning Road and Hayman Road)
- **Section 2B:** Kent Street (between Hayman Road and Jarrah Road)
- **Section 2C:** Kent Street (between Jarrah Road and Gloucester Street)
- **Section 2D:** Miller Street (between Gloucester Street and Bishopsgate Street)
- **Section 2E:** Roberts Road (between Bishopsgate Street and Orrong Road)

15.2.1 2A – Kent Street (between Manning Road and Hayman Road)

The section provides a challenging environment, with Kent Street catering for the following:

- High traffic volumes (in particular 22,000 vehicles per day between Manning Road and Hayman Road, and 12,000 vehicles per day between Hayman Road and Jarrah Road).
- A high frequency bus route with multiple bus stops
- 70km/h posted speed limit between Manning Road and Hayman Road

The following modifications are recommended, in collaboration with the CoSP:

- Investigation into the reduction of the posted speed in this section to 60km/h to reduce the speed differential between cyclists using the on-road facilities and general traffic.
- Kent Street/Manning Street intersection
  - On the southbound approach, realign the bypass off-ramp to provide a smoother transition for cyclists. Install signage to direct bicycles onto the bypass off-ramp.
- Kent Street (eastern side, just north of Beazley Avenue)
  - Replace existing concrete footpath with a 2.5m-3.0m high quality red asphalt shared path with appropriate line marking and signage (approximately 230m).
- Kent Street (between Manning Road and Hayman Road)
  - Currently on-road cycle lanes are provided, however some locations are not red asphalt nor marked as cycle lanes. It is recommended that when the next resurfacing works along Kent Street are undertaken that this entire section of on-road cycle lanes are paved in red asphalt and marked as cycle lanes. In addition, green asphalt should be used for cycle lanes at intersections (i.e. Curtin Main Street and Beazley Avenue). Where possible, the existing traffic lane width should be narrowed to the minimum possible to facilitate a wider cycle lane;
  - To assist in mitigating potential conflict between cyclists using the on-road lanes and buses stopping, it is recommended that off-road bypass lanes are installed to give cyclists the option to bypass; and
  - It should be noted that a signalised pedestrian/cyclist crossing is proposed north of Waterford Plaza as part of other works.

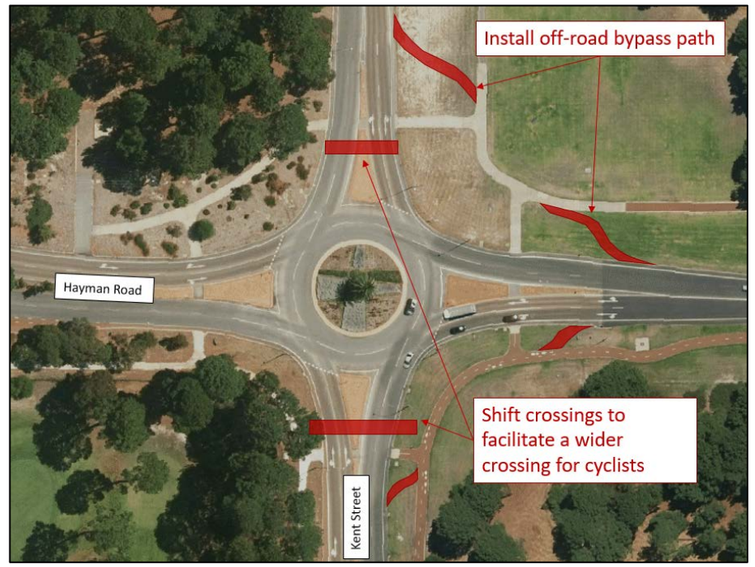
15.2.2 2B – Kent Street (between Hayman Road and Jarrah Road)

This section of Kent Street is a single carriageway, and caters for up to 12,000 vehicles a day.

The following modifications are recommended, in collaboration with the CoSP:

- Kent Street/Hayman Road intersection

  It should be noted that the ToVP are investigating improvements to the overall safety of the intersection. The following modifications to improve cycling should be considered as part of any future works.
  - Shift the median cut-through at the crossings on both the Kent Street approaches to provide appropriately wide refuge for cyclists and install holding rails; and
  - Install appropriate off-road bypass paths on both the Kent Street approaches to ensure a smooth transition to the north-south crossing point. The existing east-west crossing point and path provided is at right angles to the on-road cycle lanes and does not provide an appropriate off-road bypass path.

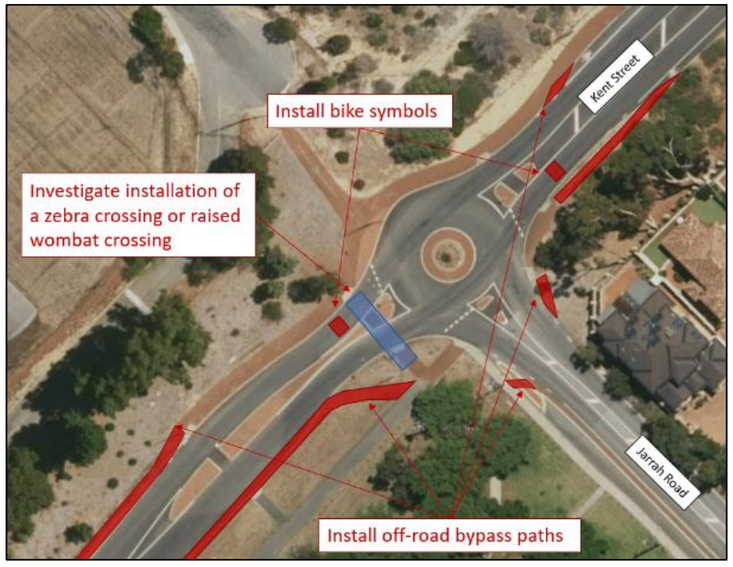


- Kent Street (eastern side, between Hayman Road and Jarrah Road)
  - Replace existing concrete footpath with a 2.5m-3.0m high quality red asphalt shared path with appropriate line marking and signage.

- Kent Street/Dick Perry Avenue/Turner Avenue intersection
  - Install off-road bypass paths with smooth transitions on the Kent Street approaches.

- Kent Street (between Dick Perry Avenue and Jarrah Road)
  - There is a gap in on-road cycle lanes in this location. It is recommended that the road cross section is widened to provide 1.5m continuous marked bike lanes plus a 500mm painted hatching buffer to the traffic lane.
- Kent Street/Jarrah Road/Baron-Hay Court

  In collaboration with the CoSP, the following is recommended:
  - Realign the existing off-road bypass path to provide a smooth transition for on-road cyclists opting to navigate the roundabout;
  - Install holding rails on all approaches to the intersection;
  - Install bicycle pavement symbol in the centre of the approach lane on Kent Street to raise driver awareness for cyclists circulating the roundabout; and
  - This is an important intersection for cyclists, as it also connects to a local cross route. The following improvements are recommended in collaboration with ToVP:
    - Install appropriate off-road bypass paths with smooth transitions for on-road cyclists on all approaches to the roundabout to ensure connectivity. Construct an entry ramp onto the southbound bike lane along Jarrah Road from the south-east corner of intersection; and
    - Consider installing a zebra crossing or raised wombat crossing on the south-western leg of the intersection to assist cyclists in crossing the local route. Note that further investigation may be required as this would need to meet the Main Roads warrants for the provision of controlled crossings.

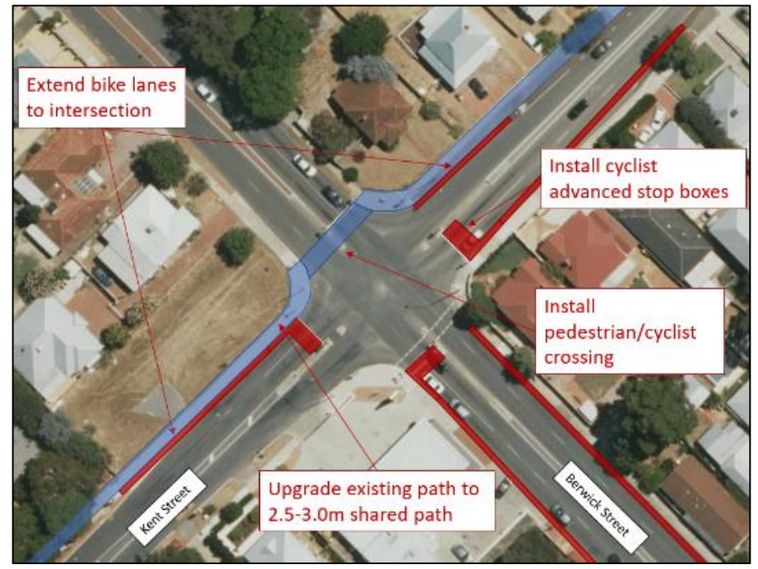


15.2.3 2C – Kent Street (between Jarrah Road and Gloucester Street)

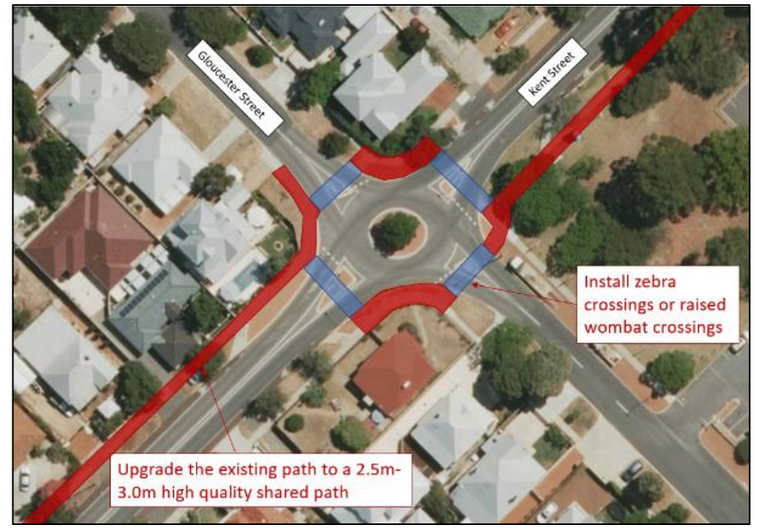
The following modifications are recommended for this section of Kent Street:

- Kent Street (between Jarrah Road and Gloucester Street)
  - Formalise the existing shared path on the northern side by including pavement marking and signage. Between Jarrah Road and Etwell Street there is an opportunity to enhance the amenity and attractiveness of the shared path by improved landscaping adjacent to the path; and
  - Currently on-road cycle lanes are provided, however they are not surfaced with red asphalt. It is recommended that when the next resurfacing works along Kent Street are undertaken that this entire section of on-road cycle lanes are paved in red asphalt. In addition, green asphalt should be used for cycle lanes at intersections (i.e. Curtin Main Street and Beazley Avenue). Where possible, the existing traffic lane width should be narrowed to the minimum possible to facilitate a wider cycle lane.
- Kent Street/Etwell Street intersection
  - Install appropriate off-road bypass paths with smooth transitions for on-road cyclists on all approaches to the roundabout to ensure connectivity; and
  - Widen the median cut-through at the crossings on both the Etwell approaches to cater for cyclists and install holding rails.
- Kent Street/Devenish Street intersection
  - Install appropriate off-road bypass paths with smooth transitions for on-road cyclists on both Kent Street approaches to the roundabout to ensure connectivity.
- Kent Street/Berwick Street intersection
  - Install advanced cyclist stop boxes on the Kent Street approaches. Note that advanced cyclist stop boxes are also recommended on the Berwick Street approaches as this forms part of the strategic route.

  Ensure that the traffic signal detectors identify cyclists at the approaches.



- Kent Street (between Berwick Street and Gloucester Street)
  - Ensure that the shared path pavement continues across all driveway crossovers to maintain priority for cyclists/pedestrians.
- Kent Street/Gloucester Street intersection
  - Make minor modifications to improve the off-road bypass transition points on both approaches; and
  - Remove signage indicating for bicycles to exit the roadway. This signage is confusing as cyclists have the choice to 'claim' a lane at the approach to the roundabout.

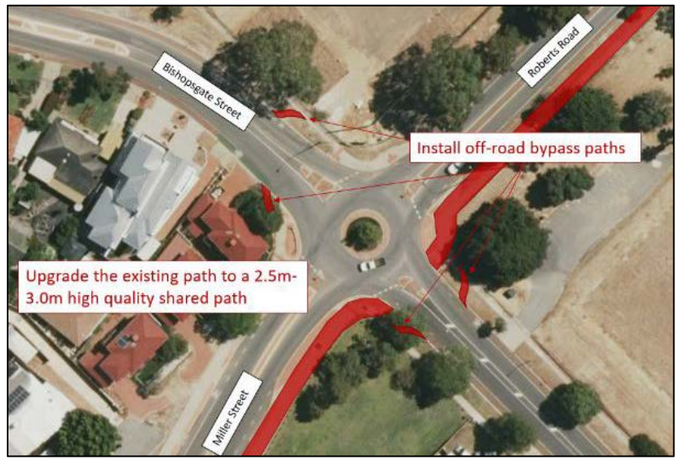


15.2.4 2D – Miller Street (between Gloucester Street and Bishopsgate Street)

As with Kent Street, Miller Street caters for high traffic volumes (up to 12,000 vehicles per day) and a high frequency bus route, and has a posted speed limit of 60km/h. Existing on-road cycle lanes along Miller Street lack continuity, and are not surfaced with red asphalt east of Sunbury Road. A shared path runs along the south side of Kent/Miller Street, varying in quality and width. The Kent Street/Albany Highway/Miller Street intersection is a significant conflict for cyclists, with a lack of safe options for cyclists.

The following modifications are recommended with further investigation required:

- Miller Street (between Albany Highway and Bishopsgate Street)
  - Upgrade existing footpath to a 2.5m-3.0m shared path on the southern side; and
  - Currently marked on-road cycle lanes are provided, however the section between Sunbury Road and Bishopsgate Street are not surfaced with red asphalt. It is recommended that when the next resurfacing works along Miller Road are undertaken that this section of on-road cycle lanes are paved in red asphalt with green asphalt used at intersections. Where possible, existing traffic lanes should be narrowed to the minimum possible to facilitate wider cycle lanes.
- Kent Street/Albany Highway/Miller Street intersection
  - The intersection is hazardous for on-road cyclists, with high traffic volumes, wide lanes and high approach and circulating speeds of vehicles;
  - Install appropriate off-road bypass paths with smooth transitions for on-road cyclists on both Kent Street approaches to the roundabout to ensure connectivity; and
  - Investigate the following potential treatment options to reduce the approach speed of vehicles and reduce the chance of conflict:
    - Raising the circulating area of the roundabout as a plateau to slow vehicles on approach;
    - Installing alternative paving in the circulating area of the roundabout to indicate a slow, shared environment; and
    - Investigate the opportunity to reduce the width of the circulating lanes and providing mountable kerbing in the central island for larger vehicles. This will require consultation with the PTA with regards to buses using the roundabout. The investigation should be coordinated so that potential intersection modifications will coincide with any future resurfacing works.
- Miller Street/Shepperton Road intersection
  - This intersection is considered hazardous for road users, and may be subject to black spot funding; and
  - Consider the installation of advanced cyclist stop boxes on the Miller Street approaches connecting to the on-road cycle lanes.
- Miller Street/Sunbury Road/Beatty Avenue
  - Install holding rails at the crossings on the Sunbury Road and Beatty Avenue approaches.
- Miller Street/Bishopsgate Street/Roberts Road intersection
  - Install appropriate off-road bypass paths with smooth transitions for on-road cyclists on the Bishopsgate Street approaches to the roundabout to ensure connectivity.
  - As part of the Lathlain Park Redevelopment Project, the connectivity between Lathlain Oval and the former Carlisle Lathlain Bowls Club is proposed to be improved and should be coordinated with works as part this project.



15.2.5 2E – Roberts Road (between Bishopsgate Street and Orrong Road)

Roberts Road forms the final link between the rest of the east-west route, with the opportunity to provide a continuous cycle connection into the City of Belmont.

The following modifications are recommended, with further investigation required:

- Roberts Road (between Bishopsgate Street and Orrong Road)
  - Upgrade existing footpath to a 2.5m-3.0m shared path on the southern side; and
  - Currently marked red asphalt on-road cycle lanes are provided, however the lanes are not marked at intersections with side roads. In order to enhance the route, it is recommended that green asphalt is installed at the bike lanes across all intersections. Where possible, the existing traffic lane width should be narrowed to the minimum possible to facilitate a wider cycle lane.
- Roberts Road/Star Street/Howick Street intersection
  - Install holding rails at the crossings on the Howick Street and Star Street approaches to cater for cyclists.
- Roberts Road/Orrong Road
  - As part of other works, the intersection of Orrong Road/Roberts Road is planned to be modified to remove the right turn movement out of Roberts Road. Provision for a wider pedestrian/cyclist crossing at Orrong Road should be coordinated at the same time, including the installation of holding rails for cyclists in the median island.

3 Albany Highway Investigation

Albany Highway (between Oats Street and the Causeway) is a key commercial and entertainment destination for Town of Victoria Park residents and for the wider Perth metropolitan area. Access to this area is predominantly by car, with up to 15,000 vehicles a day, while the posted speed limit is 40km/h for the entire length. The parallel Shepperton Road carries significantly higher traffic volumes, and although there is some usage from cyclists, bicycle infrastructure is not recommended along this route.

Albany Highway is a key through route and destination for recreational cyclists, however there is a significant opportunity to increase ridership for less confident cyclists. As such, priority should be given to bringing cyclists to Albany Highway as a destination. In assessing Albany Highway, the interaction between different types of cyclists and other road users needs to be carefully considered.

- In order to increase ridership for less confident cyclists, separation from vehicle traffic should be considered. Currently, less confident cyclists will ride on the existing footpath which has multiple conflict points, including pedestrians, service infrastructure, outdoor dining areas etc.
- In order to create a safer environment for confident cyclists (including recreational cyclists), it is recommended that the posted speed limit is reduced further to 30km/h.

The following modifications are recommended, with further investigation required.

- Lower cost improvements in the short term include:
  - Include traffic calming measures to slow vehicles along the route;
  - Enhance the street environment with signage and pavement markings to increase driver awareness and influence driver behaviour. This is particularly important at points where cyclists are likely to come into conflict with motor traffic and are potentially at risk. City of Perth have implemented similar signage to increase awareness of cyclists and modify motorist behaviour. Potential locations include:
    - The narrow sections with high activity such as between Dane Street and Sussex Street, and McMillan Street and Mackie Street.
  - Install additional zebra crossings along Albany Highway which will assist in slowing vehicles and increasing driver awareness; and
  - In coordination with the implementation of the above measures, reduce the speed limit for the full length of Albany Highway to 30km/h.
- It is proposed that Albany Highway remains a local route, whilst recognising that significant modifications will be required to improve the cycling environment, which will require extensive modifications and stakeholder consultation.

It is recommended that investigation into potential long term options to treat Albany Highway to incorporate and enhance access for cyclists is undertaken. As part of the investigation, the option of removing parking on one side of Albany Highway and installing a bi-directional cycle path on that side should be investigated further. In order to offset the loss of parking, the parking on the other side of Albany Highway could be reconfigured to 45

degree parking (refer to Figure 15-2). As part of the investigation there may be merit in investigating a parallel route, such as Litchfield Street/Swansea Street to support access to Albany Highway. Additionally, the investigation should consider a balance between safe and comfortable pedestrian movements (including disability access), the feasibility of off-street parking facilities, potential for increased tree canopy and awning cover, and overall traffic calming strategy that is bicycle friendly. It is recognised that significant works is required to improve the cycling environment along Albany Highway, with significant stakeholder consultation and further investigation into the feasibility of various options required.

It should be noted that there is strong evidence that the installation of bicycle infrastructure (i.e. bike lanes and bike parking) and shared space arrangements in commercial precincts can increase revenue for local businesses. For example the New York City Department of Transportation assessed the impacts that the implementation of 'sustainable streets' had throughout the city ("The Economic Benefits of Sustainable Streets, 2013). One case study at Brooklyn's Vanderbilt Avenue saw a doubling in retail sales in the three years following installation of bicycle lanes and a tree-lined median, with the area significantly outperforming city-wide trends.

With the potential introduction of light rail transit, Albany Highway may undertake significant changes in the long term which should be considered. An indicative cross section that includes shared light rail transit/general vehicle lanes is shown in Figure 15-3.

4 Gloucester Street Project

It is proposed that Gloucester Street forms part of a secondary north-south route between the City of Canning (via Berwick Street) and the South Perth foreshore (via Armagh Street and the Hordern Street underpass). Gloucester Street provides an alternative north-south option to Berwick Street, which has narrow shoulders, excessive traffic volumes and a narrow available cross section.

Gloucester Street carries predominantly low traffic volumes (<1,000 volumes) and it is proposed to be developed into a safe active street, providing suitable a connection for both confident and less confident cyclists, with the following additional opportunities:

- Gloucester Street provides a strategic connection to the east-west Kent Street secondary route
- Gloucester Street provides a local connection to the Park Avenue shopping centre

The following modifications are recommended, with further investigation required:

- Upgrade the existing footpath within John Macmillan Park to a 3.0m high quality shared path to provide an attractive connection to the Park Centre;
- Upgrade the existing footpath along Kent Street between Gloucester Street and John Macmillan Park to a 3.0m high quality shared path;

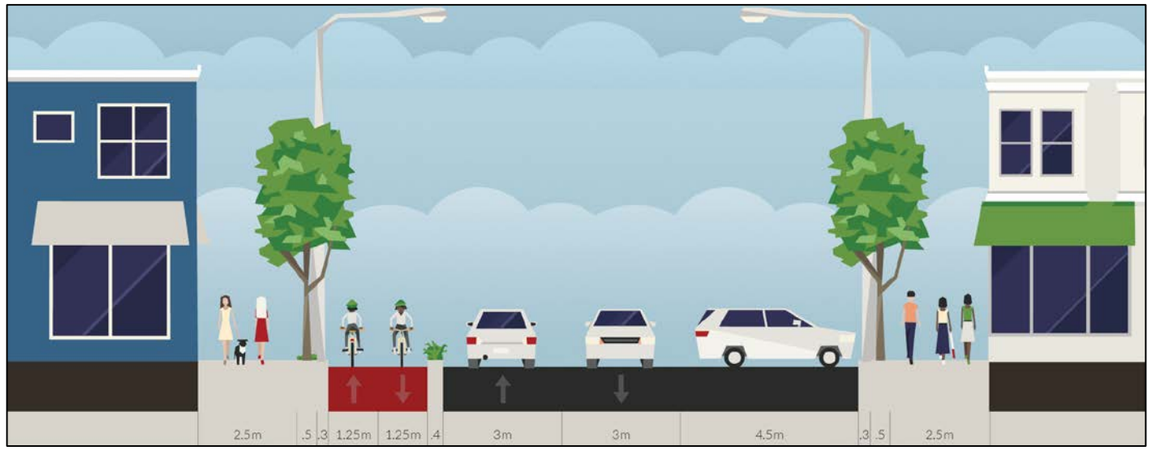


Figure 15-2: Potential Albany Highway cross section with bi-directional cycle lanes and angled parking

Figure 15-3: Potential Albany Highway cross section with bi-directional cycle lanes and shared light rail transit/general traffic lanes

- Install raised wombat crossings at the approaches to the Kent Street/Gloucester Street roundabout to slow vehicles and increase priority for crossing cyclists and pedestrians; and
- Develop Gloucester Street (between Kent Street and Armagh Street) and Armagh Street (between Gloucester Street and Hordern Street) into a Safe Active Street. This could include the following treatments:
  - Reducing the posted speed limit to 30km/hr;
  - Formalising on-street parking using line-marking;
  - Reversing the directional priority at multiple intersections to provide cyclists with through priority, including State Street, Manchester Street, King George Street, McMaster Street, Cargill Street and Armagh Street;
  - Installing raised plateaus at intersections; and
  - Enhancing the attractiveness of the street.
- Hordern Street underpass at Canning Highway
  - The underpass is prone to flooding. Consider covering the open vents in the underpass structure with clear plastic or other appropriate material to reduce the chance of flooding. Regular maintenance of the drainage collection points at the ends of the tunnel is also required to ensure no blockages; and
  - Investigation into measures to reduce conflict between cyclists and pedestrians, and improving the overall amenity of the underpass.

Some challenges exist, which will require further investigation, including:

- The interface between the Berwick Street/Kent Street intersection and Gloucester Street will require further investigation. The interface between the north-south and east-west secondary routes will need to be carefully considered;
- The crossings at Kent Street and McMillan Street will require further investigation; and
- A short section between McMillan Street and King George Street is part of the 960 bus route (1 bus stop).

5 Oats Street Project

Hill View Terrace and Oats Street forms part of a key secondary route that connects multiple key destinations including Curtin University, Albany Highway, TAFE Carlisle, Aqualife and Oats Street Station. The route carries significant traffic volumes (up to 15,000 vehicles per day) and caters for a high frequency bus route.

This project aims to reinforce the Hill View Terrace/Oats Street secondary route by addressing the gap in dedicated on-road cycle lanes between Albany Highway and Shepperton Road and enhancing the existing on-road cycle lanes.

The proposed recommendations for the Oats Street Project are divided into sections and outlined below.

15.2.6 Hill View Terrace (between Holder Street and Albany Highway

The following modifications are recommended, with further investigation required:

- Hill View Terrace (between Holder Street and Boundary Road)
  - Install new 1.5m wide on-road cycle lanes between Holder Street and Boundary Road; and
  - At the Holder Street roundabout, install appropriate off-road bypass paths to ensure a smooth transition with the shared path proposed on the north side of Marquis Street and the proposed bike lanes on Hill View Terrace.
- Hill View Terrace/Boundary Road/Jarrah Road intersection
  - Install advanced cyclist stop boxes on the Hill View Terrace approaches.
- Hill View Terrace (between Boundary Road and Albany Highway)
  - Upgrade the existing on-road cycle lanes as part of the next resurfacing, ensuring red asphalt and adequate bicycle pavement markings and signage.

15.2.7 Oats Street (between Albany Highway and Orrong Road)

The following modifications are recommended, with further investigation required:

- Oats Street (between Albany Highway and Shepperton Road)
  - There is a gap in on-road cycle lanes in this location. It is recommended that the road cross section is widened to provide 1.5m continuous marked bike lanes. This requires further investigation as the road corridor is constrained in this location.
- Oats Street/Albany Highway intersection
  - Install advanced cyclist stop boxes on the Oats Street approaches.
- Oats Street/Shepperton Road intersection
  - Upgrade the Oats Street/Albany Highway and Oats Street/Shepperton Road intersection to include on-road cycle lanes through the intersection.
- Oats Street (between Shepperton Road and Orrong Road)
  - Currently narrow sealed shoulders are provided, however they are not marked as cycle lanes or surfaced with red asphalt. It is recommended that this entire section of on-road cycle lanes are widened to 1.5m and paved in red asphalt. In addition, green asphalt should be used for cycle lanes at all intersections. Where possible, the existing traffic lane width should be narrowed to the minimum possible to facilitate a wider cycle lane.
- Oats Street/Read Street intersection
  - Install appropriate off-road bypass paths on both the Oats Street approaches to ensure a smooth transition to the north-south crossing point; and
  - Install a median cut-through at the crossing on the Read Street approach to appropriately cater for cyclists and install holding rails.
- Oats Street/Bishopsgate Street intersection
  - The opportunity to provide smooth transitions to off-road bypass paths at the Oats Street approaches is limited at this intersection, however should be investigated. Investigation into slowing vehicles down on the approach to the intersection should also be undertaken, i.e. with horizontal deflection; and
  - It is also recommended that bicycle pavement markings are installed at the centre of the lane on the roundabout approaches to increase awareness of cyclists who are likely to take the lane.
- Oats Street/Star Street
  - Modify the off-road bypass paths on the eastern Oats Street approach to ensure a smooth transition. Remove the tactile ground surface indicators as these are a hazard for cyclists and not appropriate in this location;
  - Install holding rails at the crossings on the Star Street approaches; and
  - Remove the unnecessary tactile ground surface indicators at the off-road cyclist bypass path.

- Oats Street/Orrong Road
  - In collaboration with the City of Belmont and Main Roads, install advanced cyclist stop boxes on the Oats Street approaches connecting to the on-road cycle lanes.

6 Hayman Road Project

This project aims to address a gap in the existing shared path on the western side of Hayman Road. This section of Hayman Road is critical in providing connectivity to and between Curtin University, Bentley TAFE Campus, and other nearby destinations. Hayman Road is a secondary route and caters for both confident and less confident cyclists which needs to be considered.

It should be noted that Hayman Road is planned to be upgraded to a dual carriageway (two lanes in each direction), with works at the Curtin Main Street intersection recently completed.

The following modifications are recommended, with further investigation required.

- Western side of Hayman Road (between Adie Court and Marquis Street)
  - Upgrade the existing footpath to a 2.5m-3.0m high quality shared path to connect to the existing high quality shared path (just north of Adie Court). This should include the provision for lighting on the shared path; and
  - Zebra crossings (or raised wombat crossings desirably) should be installed at all crossovers to increase priority for cyclists using this path. This may require further investigation to understand the volume of pedestrians and cyclists using this route.
- Hayman Road/Allen Court/Curtin Main Street intersection
  - Investigate improving crossing priority for cyclists at the intersection, i.e. install zebra crossings across all left turn pockets and reconfigure the signal phasing to allow the pedestrian through phase to remain green until right turning vehicles trigger the loop detectors. This simple shift in signal configuration not only provides improved priority for cyclists/pedestrians but also provides a visual incentive to walk and cycle to Curtin University. This could be undertaken as a trial project, as further discussed in Section 15.5.5.
- Marquis Street (between Hayman Road and Holder Street)
  - Upgrade the existing footpath on the northern side of Marquis Street to a 2.5m-3.0m high quality shared path; and
  - Note that Marquis Street is an important connection point to both Hill View Terrace (secondary route) and Holder Street (local route connecting into the City of Canning). Treatment at the intersection of Marquis Street/Hill View Terrace/Holder Street will need careful consideration and further investigation. Modification of the existing entry point into Juniper Annesley may be required, which will require further liaison and investigation.

15.3 Minor Works Improvements

Several infrastructure improvements to additional cycle routes, not captured in the key project recommendations, have also been identified where relatively minor works is required. It is proposed that these 'quick win' projects are also completed over the next five years to improve the amenity of cycling routes. These improvements are listed below:

15.3.1 Rutland Avenue

In the interim to the Rutland Avenue project works, the following modification has been identified. which is recommended to be undertaken in the short term:

- Great Eastern Highway overpass at Rutland Avenue/Streatley Road
  - Improve connection to the off-road path by constructing smooth transition from Rutland avenue.

15.3.2 Causeway

The following is recommended in the vicinity of the Causeway:

- The pavement markings at the transition from shared path to cycle only path just west of the Causeway is misleading as pedestrians may continue along the cycle only path. The shared path pavement marking on the cycle only path should be removed, and a small footpath connection should be constructed to direct pedestrians appropriately; and
- Canning Highway underpass at the Causeway
  - Formalise priority of path intersection at the west side by installing give way line at the terminating leg.

15.3.3 Great Eastern Highway

A conflict point exists for cyclists travelling east-west along the Great Eastern Highway, connecting to the overpass to access the proposed principal shared path along Rutland Avenue/Goodwood Parade.

The following modifications are recommended, with further investigation and liaison with Main Roads and PTA required:

- Install a new 2.5m-3.0m high quality shared path on the northern side of Great Eastern Highway to bypass the existing bus stop. The path should connect to the existing ramp connecting to the overpass; and
- This project will require removal of the vegetation behind the existing bus stop and moderate earthworks, plus a retaining wall is likely required.

15.3.4 Adie Court Signage

Existing signage at the Adie Court/ Jarrah Road intersection indicates that entry is only permitted for taxis and buses. It is recommended that the 'no entry' signage is modified to also allow cyclists to access the road.

15.3.5 Harold Rossiter Park

The reticulation system adjacent to Harold Rossiter Park has been found to cause flooding on the existing shared path within the park. The following is recommended:

- Investigate flooding issue on the shared path within Harold Rossiter Park from the adjacent reticulation system.

15.3.6 Bicycle Detection Loops

A common issue is the consistency of application of bicycle detection loops at signalised intersections. Without bicycle detection loops traffic signals will not be activated until general vehicles arrive at the intersection. This can often add frustration and inconvenience for cyclists during off-peak periods. The CoSP should audit all intersections within their jurisdiction to identify all applicable intersections that do not have bicycle detection loops and liaise with Main Roads to implement them.

15.4 Areas Outside Local Government Control

A number of issues identified are located in areas outside of local government control. It is proposed that the ToVP lobby for improvements to these areas, as described below:

15.4.1 Future Heirisson Island Pedestrian/Cycle Bridge

The Perth and Peel Transport Plan at 3.5 million highlights a new pedestrian and cyclist only bridge, connecting from McCallum Park (just east of the Causeway) and over Heirisson Island to the Perth CBD. It is recommended that the Town of Victoria Park continue to lobby state government to accelerate the construction of this bridge in the next five years.

In the interim, the following modifications to the Causeway are recommended and should be discussed with the City of Perth:

- Resurface shared path and include signage indicating single file use; and
- The existing concrete balustrade along the Causeway path provides a hazard for cyclists. The Town should consult with the City of Perth to investigate modifications to railing to improve cyclist safety.

15.4.2 Burswood Park and Perth Stadium

The existing shared path along Burswood Park, connecting to Perth Stadium caters for high demand for a mix of users, creating the potential for conflict.

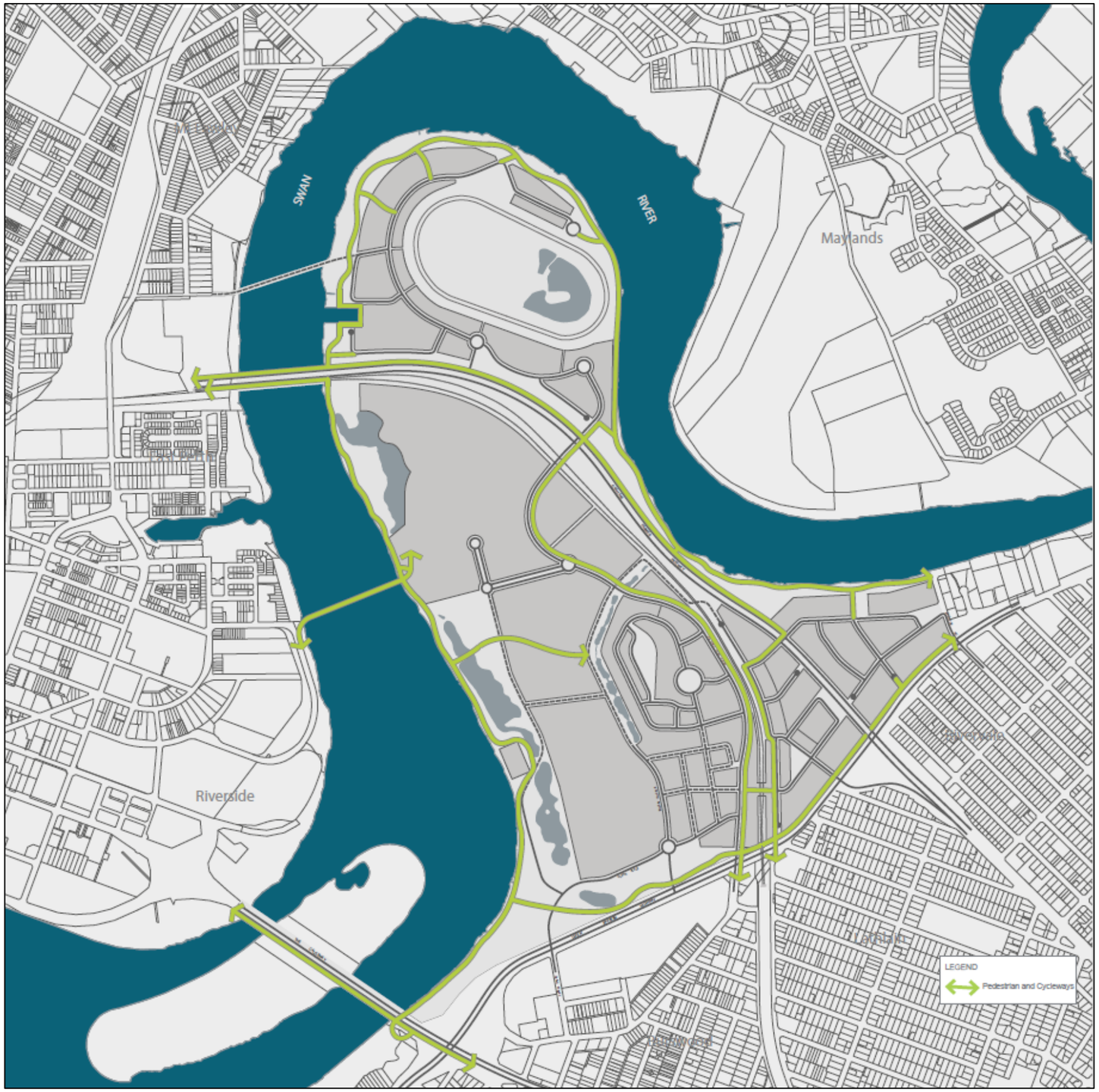
It is proposed that investigation into the installation of a separated footpath adjacent to the existing shared path and conversion of the shared path to a cycle only path. Improved lighting should also be investigated along this path to provide improved personal security, particularly given the likely increase in activity in the area during the evenings once the Burswood Stadium is completed. The existing shared path along Burswood Park is controlled by Burswood Park Board and will require further liaison.

It is recommended that a permanent cycle counter or a real-time speed display sign (north of Crown) is installed to monitor the use and behaviour on the foreshore path following the completion and opening of the new Perth Stadium. This will assist in determining the warrant for path separation.

Bicycle access and parking facilities at Perth Stadium should be strongly considered as part of the design works.

15.4.3 Orrong Road

Orrong Road is under the control of Main Roads, with long term plans for the road unclear. The ToVP should continue to liaise with Main Roads and the City of Belmont to ensure that any future plans consider cyclists.



15.5 Supplementary Project List

While investment in cycling infrastructure is highly important, there are a range of additional measures that can be employed to complement this investment, which are included in the following section.

15.5.1 Wayfinding

Wayfinding informs users of their surroundings in the built environment. It is important to show information at strategic points to guide people in the right directions. There is currently a lack of information on most routes, including directions to key links and areas of activity. The Integrated Movement Network Strategy (ToVP, 2013) proposed the development of a wayfinding strategy to be completed for the Town.

It was noted during the saddle surveys that the signage used for wayfinding needs updating (see Figure 15-5).

A wayfinding strategy for the state-wide strategic cycle network is currently being developed by the DoT. Some of the key routes of the strategic network are within ToVP and therefore an updated wayfinding strategy for the ToVP local network will require alignment with the strategic network wayfinding. This is particularly important for key attractors and destinations, such as Perth Zoo, Curtin University, Train Stations, Albany Highway, Perth Stadium, and Crown Perth.

It is recommended that a joint local wayfinding strategy is undertaken over both CoSP and ToVP council areas. Liaison with Curtin University and other key destinations (i.e. The Park Centre) should also be undertaken to provide improved awareness and consistency of entire cycle routes to local destinations (particularly at key intersections). For example, strong wayfinding from Canning Bridge to the Causeway should be provided to indicate a clear alternative route to Canning Highway for cyclists. Creative and playful branding for wayfinding signage could also be explored, such as the example shown in Figure 15-6 which was completed as part of the DoT's Your Move program (discussed further in Section 15.5.8.1).

Figure 15-5: Existing cycling wayfinding at the Rutland Avenue/Goodwood Parade overpass at Canning Highway

Figure 15-6: Cycling wayfinding pavement markings in City of Wanneroo

15.5.2 Bike Parking and Amenities

Bike parking and amenities help complement the cycle network by reducing inconveniences associated with cycling. There is a demand for end of trip facilities at a number of locations throughout ToVP, particularly at areas with high commercial activity. An audit/gap analysis of existing end of trip facilities is recommended to help gain an understanding of current supply and demand which would inform Council of the locations that could be benefited the most from further investment. The size and type of facilities that are suitable (i.e. secure bike parking, sheltered and functional bike racks and lockers) should also be considered in the analysis. The term bike rack refers to the device to which you fix your bike to. It is recommended that these be in the form that supports the entire bicycle (i.e. U-rails) and allows users to lock the bicycle frame and wheels (Department of Transport, 2014). Retrofitting vertical poles with bicycle parking racks is a potential option to increase bicycle parking. The ToVP should also aim to install bicycle parking racks at all sports grounds and playgrounds.

Key areas of focus for which the audit/gap analysis should investigate include:

- Along Albany Highway at the areas of high activity such as at café strips and major shopping centres;
- Swansea Street Markets;
- Victoria Park Markets (at John McMillan Park);
- Archer Street shops;
- Bentley Technology Park;
- Burswood Park;
- Victoria Park Library;
- Aqualife Centre;
- The Leisurelife Centre;
- Major bus stations (i.e. Curtin University);
- It is recommended to explore the use of bike parking as a tool to enhance the urban environment (i.e. art bike racks). Opportunities to advertise the health and environmental benefits of cycling, and behaviour change programs, events, and campaign should also be explored; and
- In addition, the ToVP should investigate the installation of e-bike charging stations to encourage and cater for the potential increased use in e-bikes. A potential location for an e-bike charging station is along Albany Highway commercial precinct.

Figure 15-7: Bicycle shaped bike rack

15.5.3 Cycle Monitoring

The use of cycle counters helps to understand cycling patterns over time and inform cycle-related projects into the future. There is currently a lack of cycle data available in ToVP.

Two permanent cycle counters currently exist in ToVP, which are located on the shared path connections with Windan Bridge at Burswood Peninsula. A permanent cycle counter is also located on the west side of the Causeway within the City of Perth. Recently, the Town completed temporary cycle counts for many road sections across ToVP for the first time as part of the annual traffic counts.

It is recommended that cycle data collection is increased for ToVP and analysed on a regular basis (i.e. annually) to determine changes in cyclist use. Permanent counters should be installed along key cycle corridors and temporary counts should continue to be undertaken when possible as part of road traffic counts. PBN grant funding is also available for cycle data collection, which should be applied for. The following locations are recommended for investigation into the installation of permanent bicycle counters:

- Gloucester Street, adjacent to Raphael Park. This will help capture trips heading north-south through ToVP from the Swan River Foreshore. A permanent bicycle counter should be installed as part of the proposed Gloucester Street Project (see project 4 in Section 15.2) which will help measure the success of the project;
- Rutland Avenue, south of Canning Highway. This will help capture trips heading north-south through ToVP and to/from the Perth CBD. A permanent bicycle counter should be installed as part of the proposed Rutland Avenue Project (see project 1 in Section 15.2) which will help measure the success of the project;

- Kent Street shared path on the north side, west of Berwick Street. This will help capture east-west trips through ToVP and to/from Curtin University. A permanent bicycle counter should be installed as part of the proposed Kent Street Project (see project 2 in Section 15.2) which will help measure the success of the project;
- Kent Street shared path on the east side, north of Manning Road. This will help capture north-south trips into Curtin University and help justify the need for a shared path on the west side of Kent Street in the long term;
- Taylor McCallum Park, on the separated cycle path proposed in the master plan. This will help capture the number of cyclists trips using this highly utilised path; and
- Burswood Park. This will help capture the volume of cyclists using the shared path north of the Causeway and would help justify pedestrian and cyclist separation.

In addition, the number of pedestrians using shared paths should be monitored regularly (i.e. using video surveys), to assess demand and justify the potential need for path widening or separation. The ToVP should allow for the collection of pedestrian data at the above sites on a regular basis, i.e. annually.

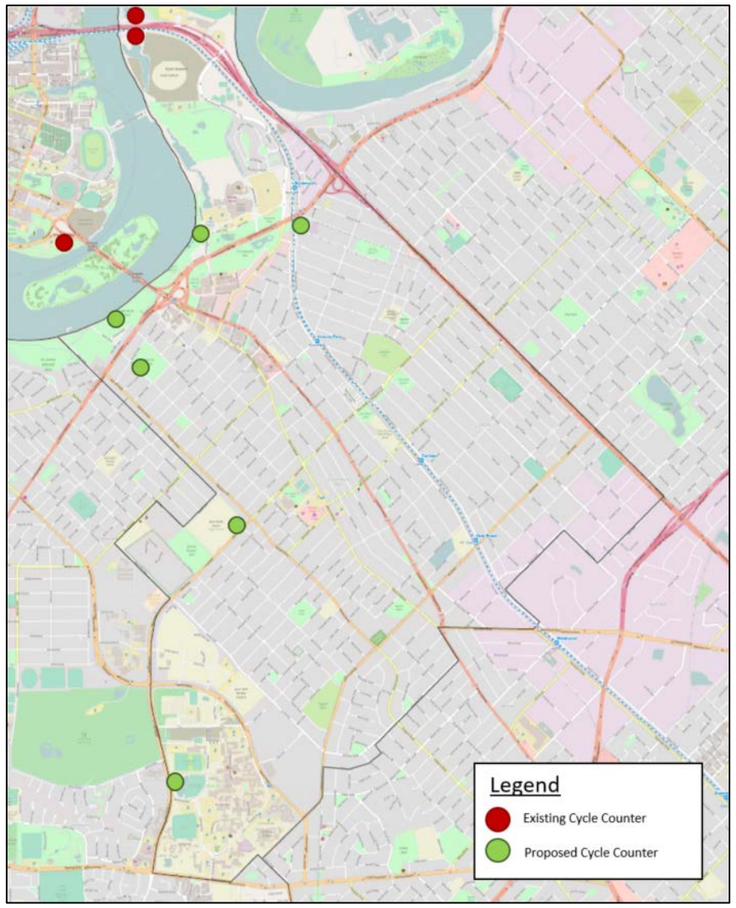


Figure 15-8: Proposed location of permanent cycle counters in ToVP

15.5.4 Dedicated Cycle Tracks

Cycle tracks located in community parks for recreational use are increasing in popularity throughout Perth. These facilities provide an environment for cyclists to ride separate from general traffic. A number of local governments have installed cycle track facilities in Perth which have been observed to have high levels of use. Two popular types include:

- Pump Tracks – These facilities often consist of circular loops with smooth dirt mounds and berms that cyclists can ride around in a pumping motion. These facilities can also include bike jumps, which are associated with more experienced cyclist skills; and
- Bike Skills Track – These facilities often consist of asphalt path circuits with pavement markings and signage simulating an urban traffic environment. These facilities are targeted for youth/beginner cyclists.

A recent example for this is at Shepherds Bush Park in Kingsley, Joondalup. This facility has a 'Pump and Jump Track' which additionally features jumps to offset the replacement of the BMX park. A children's Bike Skills Track is also located adjacent to this.

Figure 15-9: Shepherds Bush Bike Skills Track (left) and Pump and Jump Track (right) (source: City of Joondalup)

Another example of a skills track is at Rayment Park in Lathlain, which was completed as part of the Lathlain Precinct Redevelopment Project and helps children learn road rules.

Figure 15-10: Rayment Park skills track (source: Lathlain Precinct Redevelopment Project, http://www.lathlainprecinct.com.au/zone/rayment-park-zone)

As part of the Taylor Reserve and McCallum Park redevelopment, an area is proposed for a BMX trail as part of the 'All Ages Play' Activity Hub (Taylor Reserve & McCallum Park Concept Report, November 2017). It is recommended that the feasibility of a hybrid style pump/BMX track similar to that at Shepherds Bush Park in Kingsley, but at a smaller scale, be constructed at this location. A Bike Skills Track, which has a considerably smaller footprint to the pump track, could also be considered at the Activity Hub if there is space. The facility should consider CPTED (Crime prevention through environmental design) principles.

State funding is available for these projects as part of the Trails program. Comparing to the Shepards Bush Park facilities, the Bike Skills Track can expect a construction cost of approximately $60,000 and the Pump Track $70,000. It should be noted however that these facilities are the largest of their type in the State, and could be smaller. Construction of Pump Tracks requires specific expertise and youth services are required for involvement in the design and operation. A yearly maintenance budget must also be considered for the facilities. Lessons learnt from previous councils should be enquired further prior to the development of the project (i.e. City of Joondalup), to more accurately understand project considerations.

The Bike Skills Track helps support the recommendations in the Integrated Movement Network Strategy (ToVP, 2013) to provide support for cycle training programs.

15.5.5 Trial Projects

Trial projects help kick-off new initiatives and projects that benefit cycling. A number of recent trial projects have proved successful, such as the DoT's Your Move Central Program in the ToVP which has positively influenced travel behaviour for Victoria Park Primary and Ursula Frayne Primary schools. The DoT Safe Active Street program have constructed numerous safe active streets throughout Perth (i.e. Shakespeare Road, City of Vincent) which have trialled alternative designs for cycling treatments to see what works (or not) in a local context.

It is recommended that the ToVP investigate the following projects:

- Innovative solutions to improve cycling priority
  - Investigate the reconfiguration of the signal phasing at Hayman Road/Curtin University Main Street intersection to allow the pedestrian/cyclist signal phase to remain green until left and right turning vehicles trigger the loop detectors. This improves the safety and priority for sustainable travel modes, and can help shift the behaviour of motorists. This will require consultation with Main Roads. This project may align with RAC WA's mobility agenda, and could be conducted jointly; and
  - Investigate modifications to the Kent Street/Albany Highway/Miller Street intersection to improve safe access for cyclists and reduce vehicle speeds. This will require consultation with the PTA in order to consider bus movements. This intersection forms part of the proposed recommendations for the Kent Street Project (project 2 in Section 15.2).
- Cycle volume and speed device
  - Investigate the installation of an automated cycle counter, such as the 'Bike Barometer' (see Figure 15-11). This device records passing

cyclists and pedestrians, and displays real-time cycle counts for the day, month, year and sometimes lifetime of the device. Not only does a device such as this help understand cycle patterns, but also raises awareness for cycling and gives cyclists a sense of public acknowledgement for choosing to cycle. Encouraging messages that display the benefits of cycling can also be incorporated into the device, i.e. "*You have saved the economy $XX by cycling today*", "*you saved XX fuel emissions today*". These devices have been fitted in locations around the world, as well as in Australia. The bike barometer shown in Figure 15-11 was fitted as part of a joint venture between a local bike store and the City of Moreland in Victoria.

A potential location for the device is the shared path on the south approach to the Causeway.

- Investigate the installation of a device that indicates real-time speed to cyclists along shared paths (similar to roadwork sites) and to 'slow down' if required. This can help promote behaviour change, encouraging cyclists to reduce speed in areas of high pedestrian and cyclist demand. A potential location includes the shared path at Burswood Park.

Figure 15-11: Example bike barometer in Melbourne, Victoria (http://www.velocycles.com.au/over-counter/)

- Curtin University Bike Share Scheme
  - The proposed cycle network will significantly improve the cycling connection between Curtin University and Perth rail lines. Through the proposed Canning Bridge to Curtin Link project (CoSP project 2 in Section 8.2) there will be an improved cycling connection between Canning Bridge Station and Curtin University, and through the Kent Street project (ToVP project 2 in Section 15.2) there will be an improved cycling connection between Curtin University and Victoria Park and Carlisle Stations. It is recommended that ToVP work with Curtin University and the CoSP to investigate establishing a bike share scheme with bike share docking stations located at Canning Bridge Station, Victoria Park and/or Carlisle stations and Curtin University to complement the proposed projects as part of this Plan. The potential for bike docking stations at other key locations where there is the potential for high uptake, i.e. high density locations and/or high percentages of student housing should also be investigated. The stations should be provided in locations that provide good passive surveillance, lighting and with good accessibility to the destinations.

    The potential for a bike docking station along the Albany Highway commercial precinct should also be investigated, i.e. at the ToVP council offices. Urbi bike share facilities have recently been installed at the City of Joondalup as part of a 12-month trial, with stations located around the town centre. Urbi is partnering with a number of businesses in Joondalup, such as Edith Cowan University which offer discounts to students. The scheme works by registering on the Urbi phone application, locating a bike share station, unlocking the bike and helmet (with a code supplied by the phone application), cycling for a maximum of 45 minutes, returning to any bike share station, and finishing the hire (see Figure 15-12). Payment is completed through the phone application, and is costed per a single, daily, weekly, or monthly rate provided trips are less than 45 minutes. Trips that exceed 45 minutes are charged an additional $6 per hour.

  - A consistent state-wide bike share scheme could provide increased benefits overall (i.e. better legibility and consistency in equipment), but would require state level involvement.

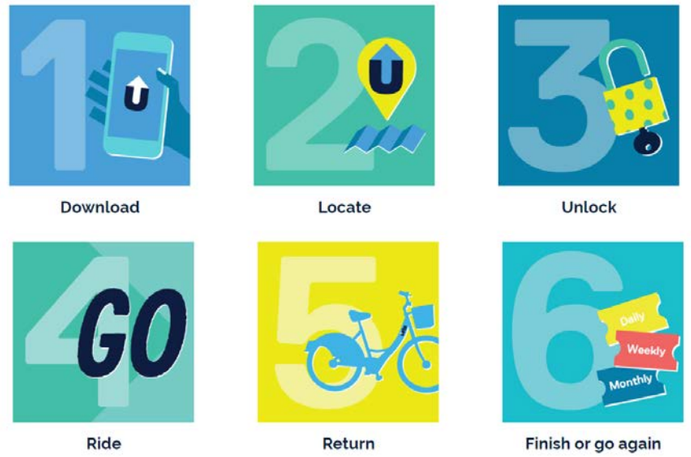


Figure 15-12: Six steps for use of Urbi Bike Share (source: *http://urbi.bike/*)

15.5.6 E-bike Scheme

E-bikes are gaining in popularity and could help encourage people to cycle because they do not require as much physical energy to operate compared to traditional bikes and allow a longer distance of travel for the equivalent amount of energy expenditure.

E-bike salary sacrificing has recently been ruled in favour of by the ATO and as a result, there are leasing and financing companies that provide e-bike packages to employers. The program typically works by deducting a monthly fee from the employee's wage, which is the pre-tax wage if the employee agrees to use the bike predominantly for work-related travel. It is recommended that CoSP/ToVP offer an e-bike salary sacrifice service to staff and promote to other organisations to offer the same service.

15.5.7 School Infrastructure Improvements

Cycle safety for youth is a critical aspect that must be considered for schools. It is recommended that cycle infrastructure audits of primary schools in the area be completed to improve infrastructure within their immediate vicinity.

As part of the school cycle infrastructure improvements, a marketing campaign aimed at parents could be undertaken to encourage students to cycle to school. Incentives and rewards for students that cycle could also be implemented. This could then lead to a reduction in demand for car parking. Additionally, this could increase the social acceptability of children riding to school unsupervised.

15.5.8 Behaviour Change Projects

In order to maximise the benefit of cycle infrastructure improvements, it is recommended to employ cultural and behavioural change strategies to encourage more people to participate in active transport and realise the benefits of the investment.

15.5.8.1 Your Move

The Department of Transport's Your Move program supports communities, local governments, schools and workplaces to promote active transport and reduce congestion. The two parts of the Your Move Program include:

- Joining Your Move online
  - Support is offered to local government, school and workplace 'champions' who want to promote walking, cycling and public transport. Through registering on the Your Move website, organisations can access information, run travel surveys, choose activities to implement, and share activities to earn rewards. Training and networking forums also run each quarter.
  - It is recommended that ToVP sign up to the program to enable internal champions to drive the Program at the council. Having CoSP lead the program in the area will encourage other organisations to also participate.
  - It is also recommended that ToVP engage with a number of organisations in the area to promote the program (i.e. Curtin University).
- Intensive Project Partnership
  - The DoT also undertakes intensive projects to influence travel choices for specific local governments, schools and workplaces. The program has previously involved partnerships with the City of Cockburn and the City of Wanneroo where it provided area specific services and products. As part of Your Move Central, the ToVP partnered with several city workplaces and households in ToVP in addition to two local primary schools (i.e. Victoria Park Primary and Ursula Frayne Primary). Many activities undertaken at the schools included National Ride to School Day events, reward schemes via posting activities on the Your Move website, a breakfast event which involved Transperth journey planning and SmartRider discounts, and branded monsters along routes to encourage youth interest. Your Move Central Program for Schools was a trial which was free for the schools.

– It is recommended that ToVP investigate the extension of the program to include additional local primary schools (i.e. Lathlain Primary and East Victoria Park). The timing and location of future intensive projects will depend on funding and strategic priorities, such as the state government's Metronet initiative. This may lead to opportunities for partnership with Curtin University, to better integrate with the surround train services.

Figure 15-13: Your Move program methodology (source: Department of Transport)

15.5.8.2 Active Transport Events

One of the major objectives of involvement in cycling and walking events is to encourage first-time users to 'give it a try.' While participation in one event may not convert the individual, the culmination of a number of events over time will considerably break down barriers, which increases the chances of changing travel habits.

Public Events

A number of annual public events are held in Perth that encourage active travel. Promotion of these events, by ToVP, could be achieved by:

- Registering a ToVP team into these events;
- Sponsoring events, i.e. hiring a bike doctor to attend public events;
- Sponsoring ToVP staff entries;
- Facilitating fundraisers for particular staff participants;
- Run rewards schemes based on participation. MBS Environmental previously ran a raffle which allowed staff to enter a ticket for each day they cycled to work during Bike Week. This encourages more than a single trip to work by bicycle; and
- Running events in ToVP that support public events. As an example a breakfast could be provided to staff who cycle or walk to work during Bike Week.

Some of the public events that promote cycling to work include:

- Bike Week- an annual celebration held in Western Australia where a number of events are held during a specific week. ToVP has previously participated in this, such as the 'Get On Ya Bike!' event organised in 2017, which included a bike expedition through ToVP followed by a complimentary barbeque at the Burswood foreshore;

- Ride2Work Day- held annually in October, it works by providing a range of incentives at key commuting destinations in cities. In 2017, a breakfast was provided at Elizabeth Quay in the Perth CBD for those who had cycled to work on that day; and
- Ride2School- Ride2School Day held is annually in March and works by encouraging active travel within school communities by celebrating those who already actively travel to school and encouraging those who don't know how to start. A number of schools in ToVP have previously been involved in this event. The Ride2School Program is also available all year-round and works with families, communities, policy-makers and partner organisations to encourage students to ride, walk, skate or scoot to school.

Local Events

In addition to supporting public events, it is recommended that ToVP facilitate events specific to the local government including:

- Introduction of an Active Commuters Breakfast or equivalent could be held for staff where a complimentary breakfast could be provided to those who choose active transport methods on that particular day. An additional incentive could include hosting a bicycle mechanic who can complete free tune-ups of attendees' bikes. A potential location for this could include at a local shopping centre, which could provide the opportunity for local advertising. Partnership opportunities could be sought with local cycling groups to offer subsidies to promote, organise and run these events.

15.5.8.3 Awareness Campaigns

There is a lack of cyclist and driver awareness and education throughout Victoria Park and the wider area. It is recommended that as part of wayfinding and revitalisation of cycle infrastructure, pavement markings and signage be installed that educate and raise awareness of the needs of other modes and how they can successfully operate together. The 'Take Care' pavement markings in the City of Perth is one current example.

A publicity campaign aimed at increasing awareness of cyclists and improving the behavior of all road users would help to counter these problems and improve cyclist safety. The WA Police Force could be invited to be a part of awareness campaigns to educate road users on cycling. Tools that can be used include street advertisements, billboards and advertisements. An example 'Share our Roads' campaign to improve bike safety in WA. Campaigns should aim to 'normalise' cycling and reinforce the image of cyclists being of all ages and demographics.

Joint awareness campaigns could be undertaken jointly by both CoSP and ToVP, and should also involve other organisations such as Curtin University who are in the process of developing a strategic behaviour change strategy.

15.5.8.4 Information

It is important that information regarding the existing cycle infrastructure is made readily available to the community, so that cycle trips are made as convenient as possible. A *Map Your Move* metropolitan map (previously TravelSmart) for the ToVP that displays walk and cycle information (available at the *Your Move website*) should be made easily available on the ToVP website. A supply of hard copies should also be available at ToVP reception.

The following information should also be made readily available to the community, i.e. on the CoSP website to encourage increased cycling:

– Information on current and planned cycling initiatives and incentives; and

– Information on e-bikes, including the increased advantages and where to acquire them.

16 Implementation

A total of seven cycling infrastructure projects, along with minor works improvements are proposed within the ToVP over the next 5 to 10 years. As mentioned earlier, high level order of cost estimates have been determined for these projects, however further investigation will need to be undertaken to develop detailed concepts and understand the true cost of each project.

As summarised in Table 16-1, the estimated cost of implementation is approximately $7.65 million. This indicates that an estimated $7.65 million is spent over the next five years to achieve the goals of this bike plan. Although this may be ambitious, a strong pledge is required to make the ToVP stand above the rest in terms of becoming a cycling city.

It is suggested that the ToVP firstly submit all the applicable projects to relevant grants and sponsorship programs for funding. It would then be preferable to approach other relevant agencies such as DoT to determine how best to implement the projects in their jurisdiction. Boundary road projects should be presented to adjacent local councils in an attempt to partner with the respective councils to implement these specific projects. The joint nature of this plan will make this process particularly advantageous with the CoSP. Also prospective business partnerships should be identified early in the process, to get business buy in and potentially set up public private partnerships.

Finally, once all of the proactive steps have been taken, the Town should have a good idea of which projects could be funded, completely or partly, by grants and sponsorships, which projects could be funded by other agencies such as DoT, which projects could be funded as part of a partnership with other councils or businesses, and which projects will have to be funded completely by the ToVP.

All of this information along with the priority of projects should then be taken into account in an exercise to allocate projects and stages of projects to the forward capital works schedule of current and future years.

Funding of the proposed supplementary initiatives described in Section 15.5 will require further investigation. As part of future more detailed costing works for each of the key infrastructure projects, funding for the supplementary initiatives should be included. In addition, the cost of some supplementary initiatives could be incorporated into the project with assistance from other sectors, for example marketing, landscaping and streetscape. Trial projects could also attract funding from other agencies such as Main Roads and RAC.

It should be noted that the maintenance of all cycling infrastructure paths should be undertaken regularly and included in the capital works schedule.

Table 16-1: Summary of estimated 5-year implementation cost for the ToVP

#	Project	Estimated Cost	Potential Funding Assistance
1	Rutland Avenue	$2.3m	50% DoT
2	Kent Street	$1.5m	50% DoT, CoSP
3	Albany Highway	$100k (investigation)	Capital Works Programme
4	Gloucester Street	$1.3m	50% DoT
5	Oats Street	$1m	50% DoT
6	Hayman Road	$450k	33% DoT, 33% Curtin University
7	Minor Works Improvements (“Quick Wins”)	$1m	Capital Works Programme
	TOTAL	**$7.65m**	

The estimated timeframes proposed for the cycling infrastructure projects are shown in Table 16-2. It is proposed that the highest priority projects are implemented first, with minor works improvements undertaken every year.

It should be noted that the estimated timeframes is intended to provide guidance only. Opportunities may arise over the implementation of this Plan which may fast track or hinder the progress of projects.

Table 16-2: Indicative five year implementation plan for the ToVP

#	Project	2018/19	2019/20	2020/21	2021/22	2022/23
1	Rutland Avenue					
2	Kent Street					
3	Albany Highway					
4	Gloucester Street					
5	Oats Street					
6	Hayman Road					
7	Minor Works Improvements (“Quick Wins”)					

17 Conclusion

The joint Bike Plan for the CoSP and ToVP sets out an action plan for immediate improvements to the cycle network and environment, and a strategic vision for the continued development and promotion of cycling within the CoSP and ToVP, in line with State Government's Perth Transport Plan for 3.5 million.

This is the first time two local governments have worked together to deliver a bike plan in Western Australia, providing an excellent opportunity to provide a consistent outcome and benefits for the local cycling community.

The desired outcome of this Plan is simple – to increase the number of people cycling. Specifically, the Plan aims to double the number of people cycling in the CoSP and ToVP over the next five years.

In a rapidly changing transport environment and with predicted increase in advanced technologies, the Plan explores some innovations that may affect cycling, including data monitoring, e-bikes, smartphone applications and international best practice infrastructure and initiatives.

In the development of the Plan, the following was undertaken:

- Detailed literature review, including previous cycle planning documents;
- Interrogation of key demographic statistics to understand the potential for increased cycling;
- Analysis of existing recorded crash data involving cyclists to understand trouble spots and wider trends;
- Assessment of the overall transport network to determine gaps in the existing cycle network and appropriate cycling connections to key existing and future trip generators; and
- Infrastructure audits, including saddle surveys, to assess the condition of existing and potential future cycle routes.

The proposed long term aspirational cycle network for the CoSP and ToVP outlines several ambitious routes aimed at making cycling a realistic and appealing option for a high proportion of the population. The aspirational cycle network has been influenced by the routes identified in the Perth Transport Plan for 3.5 million and the research, investigation and consultation undertaken as part of the project.

The 5-year implementation plans for the CoSP and ToVP focus on strengthening local connections to key destinations, including Curtin University, rail stations, schools, shopping precincts and river foreshores. A total of 13 key infrastructure projects are proposed over both council areas, made up of new and improved on-road lanes and off-road paths, with the aim of providing legible, connected and safe cycle routes. High level order of cost estimates have been determined for these projects, however further investigation will need to be undertaken to develop detailed concepts and understand the true cost of each project. Funding assistance from other agencies, such as the DoT, will need to be explored during implementation of the Plan.

Resulting from the infrastructure audits, there are many other recommendations that should be considered when any of the cycle routes are due for resurfacing or opportunities for works in those areas arise.

While investment in cycling infrastructure is highly important, there are a range of supplementary initiatives that have been proposed to complement this investment. These include:

- The development of a joint wayfinding strategy;
- Additional bike parking and amenities;
- New cycle monitoring counters;
- New dedicated cycle tracks; and
- Various behaviour change initiatives.

Additionally, several trial projects have been proposed to be investigated which can be an effective way of testing new and unconventional initiatives and projects. Proposed trial projects include automated cycle counters that display real-time cycle counts and speed data, a bike share scheme connecting from key destinations including Curtin University, and alternative infrastructure treatments at challenging areas of conflict.

The Plan proposes that an estimated $7.3 million is spent in the CoSP, and $7.65 million in the ToVP over the next five years to achieve the goals of this bike plan. Although this may be ambitious, a strong pledge is required to make the CoSP and ToVP stand above the rest in terms of becoming champions of cycling.

Both the CoSP and ToVP should also continue to work with adjacent local governments to strengthen connections and improve consistency of cycling infrastructure across council borders.

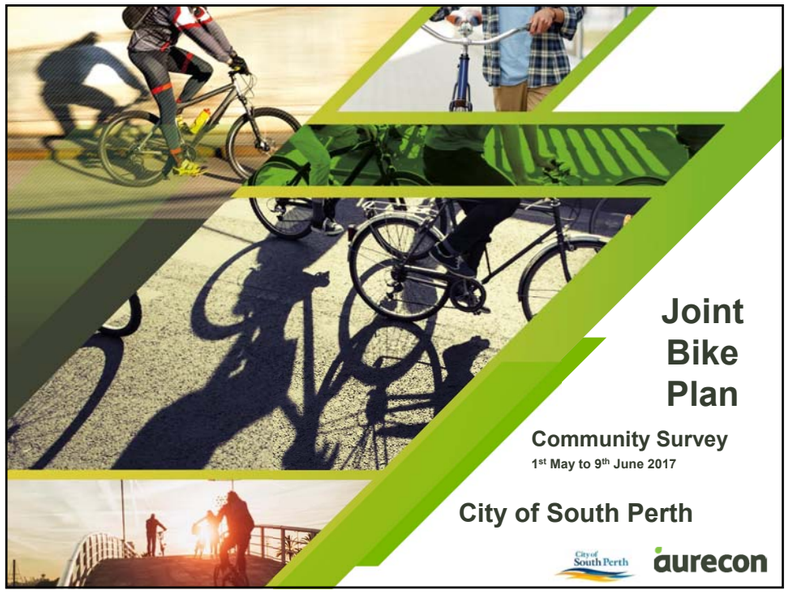
It is intended that this Plan is revisited every 5 years to assess the outcomes of the previous 5-year implementation program in continuing the journey of achieving the long term aspirational network.

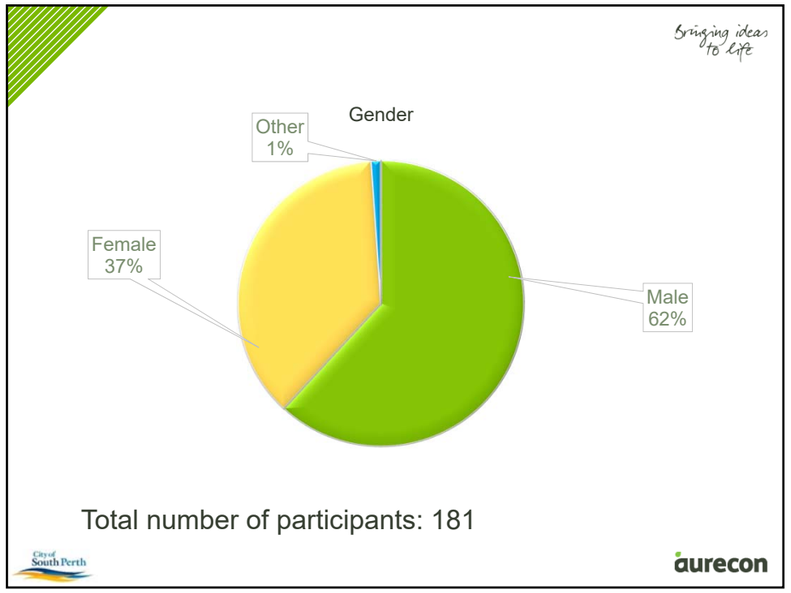
Appendices

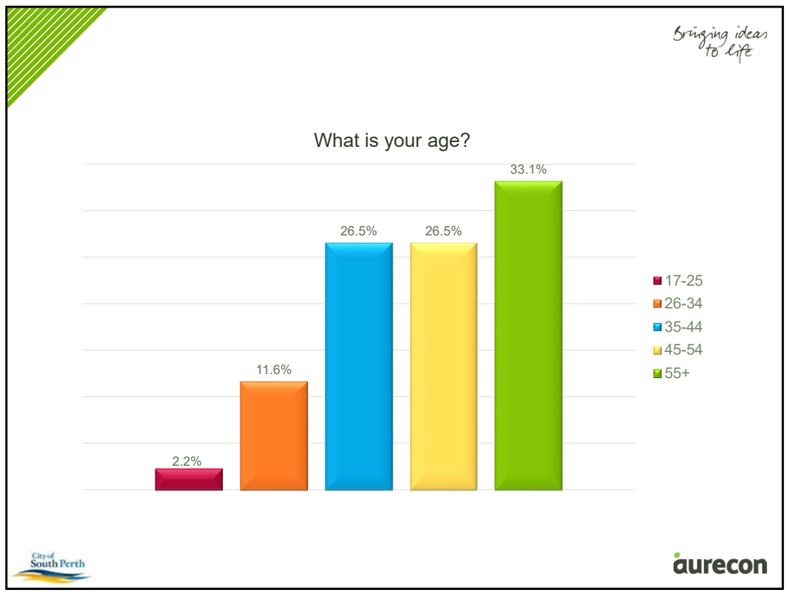
City of
South Perth

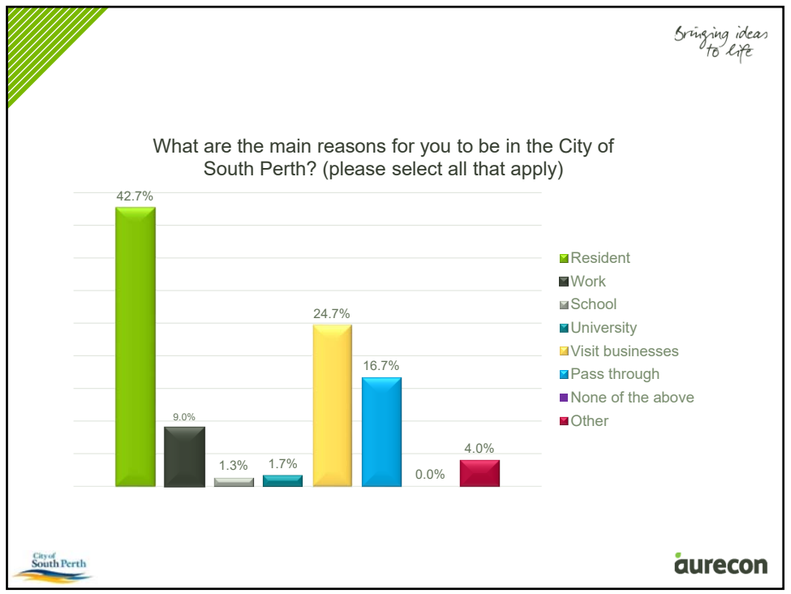
Appendix A – Community Consultation Summary (CoSP)

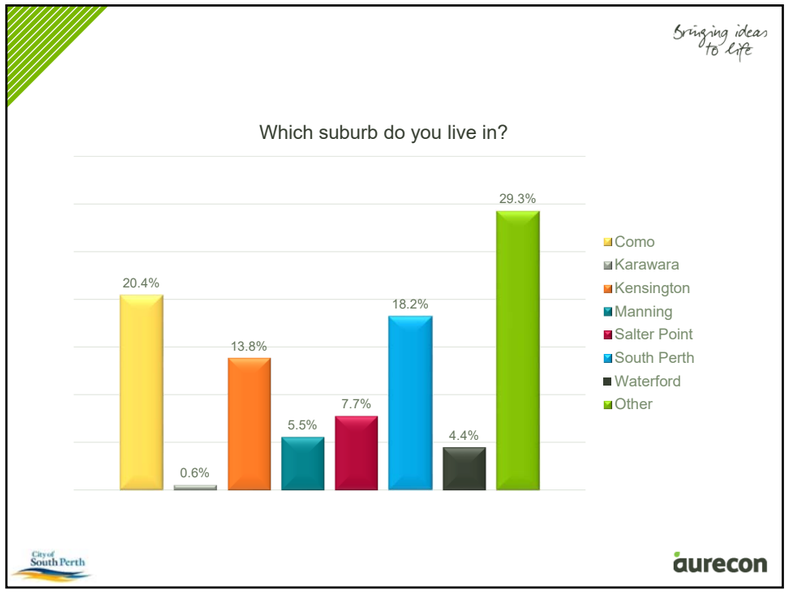
Appendix A
Community Survey – CoSP Summary

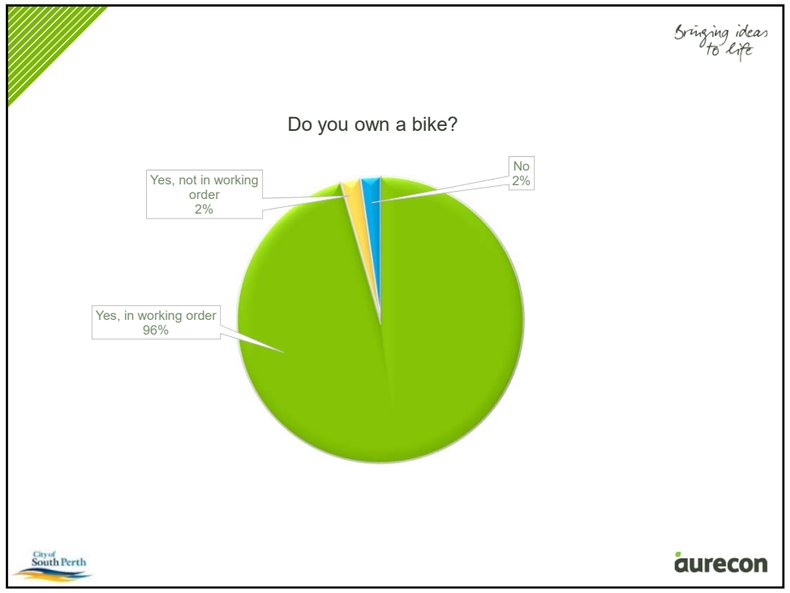


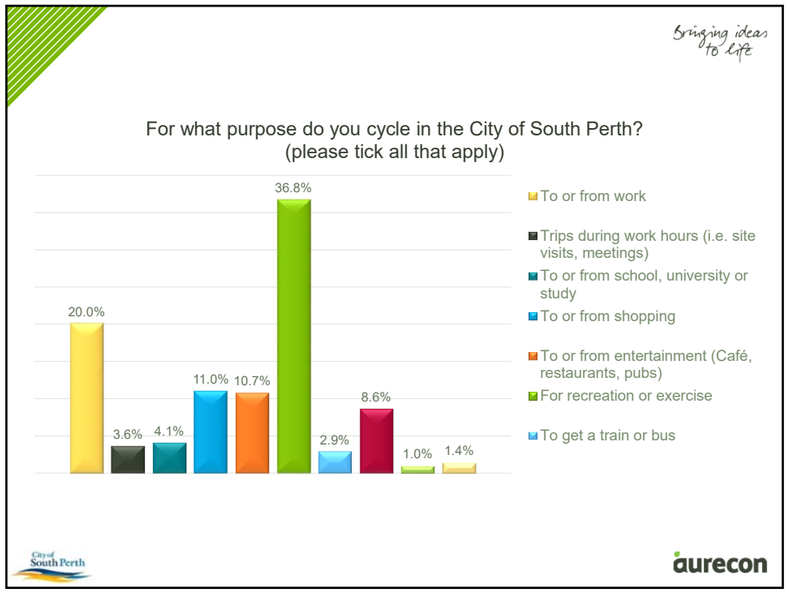


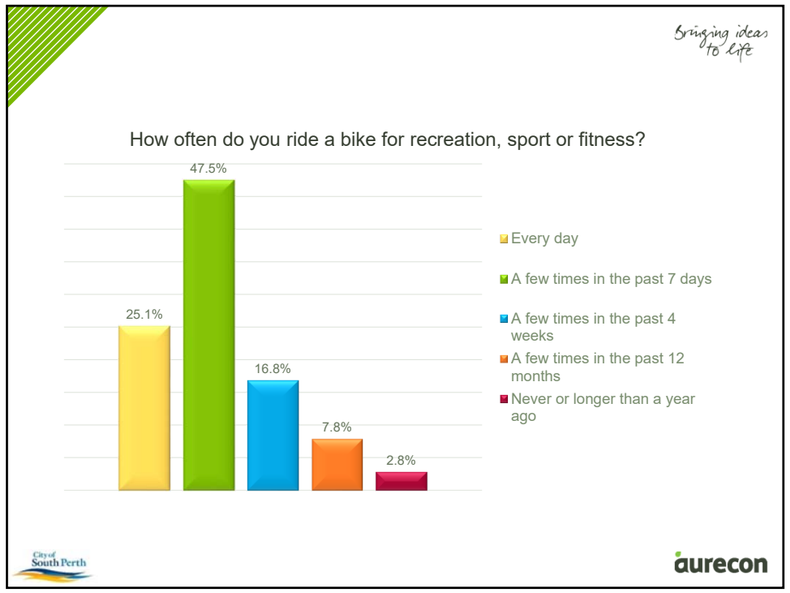




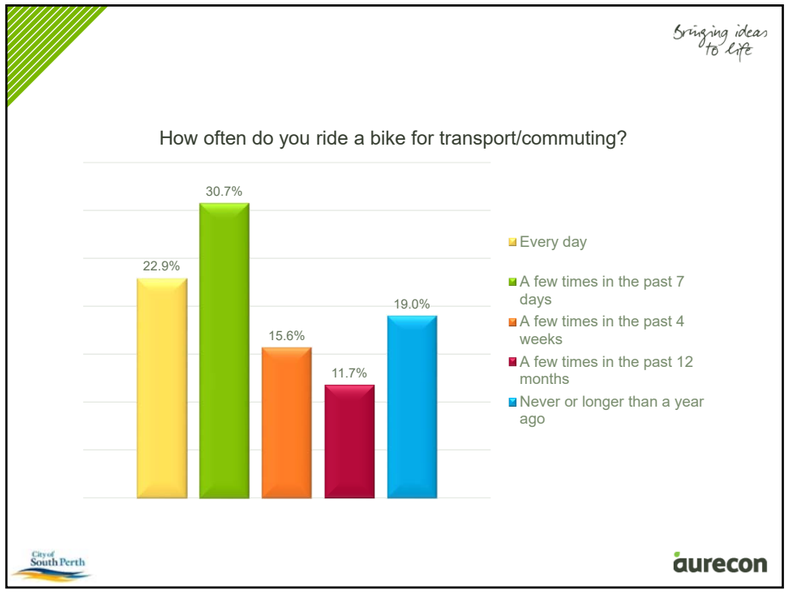

Bringing ideas to life
Which suburb do you live in?
20.4%
0.6%
13.8%
5.5%
7.7%
18.2%
4.4%
29.3%
Como
Karawara
Kensington
Manning
Salter Point
South Perth
Waterford
Other
City of South Perth
aurecon

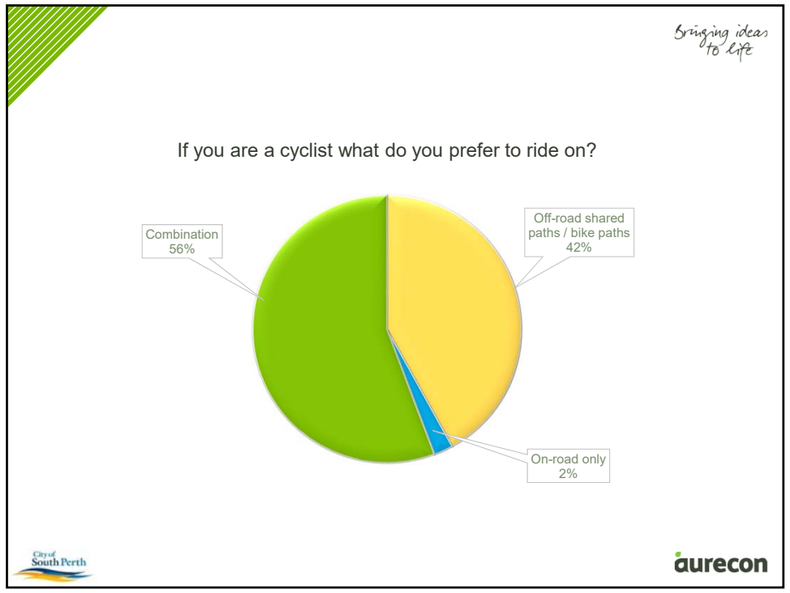

Bringing ideas to life
Do you own a bike?
Yes, not in working order 2%
No 2%
Yes, in working order 96%
City of South Perth
aurecon

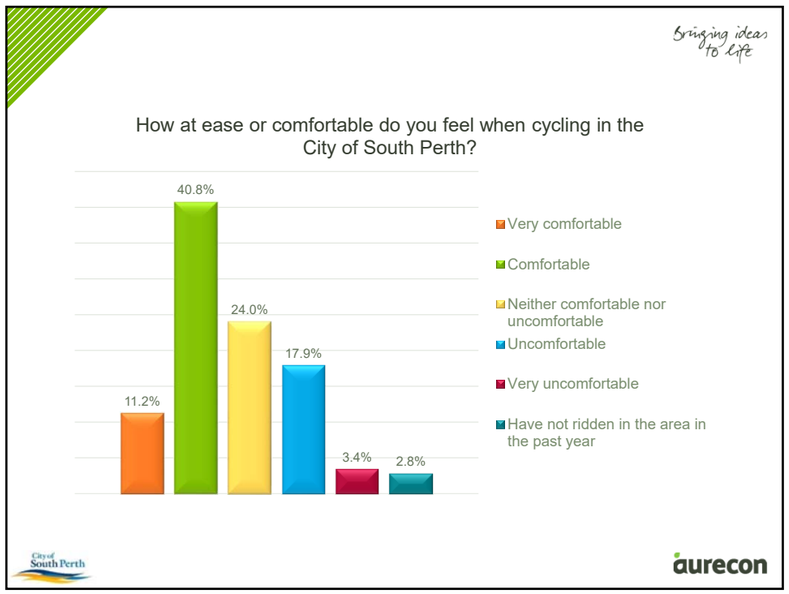

Bringing ideas to life
For what purpose do you cycle in the City of South Perth? (please tick all that apply)
20.0%
3.6%
4.1%
11.0%
10.7%
36.8%
2.9%
8.6%
1.0%
1.4%
To or from work
Trips during work hours (i.e. site visits, meetings)
To or from school, university or study
To or from shopping
To or from entertainment (Café, restaurants, pubs)
For recreation or exercise
To get a train or bus
City of South Perth
aurecon

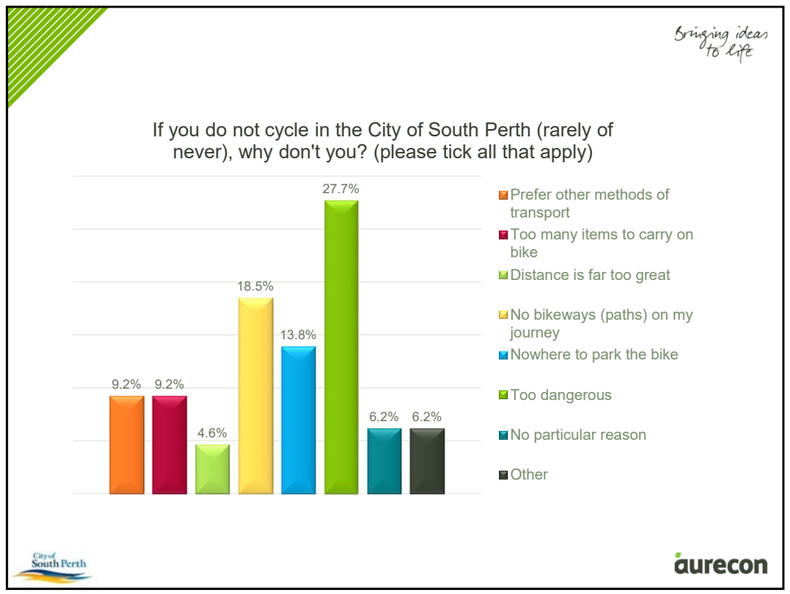

Bringing ideas to life
How often do you ride a bike for recreation, sport or fitness?
25.1%
47.5%
16.8%
7.8%
2.8%
Every day
A few times in the past 7 days
A few times in the past 4 weeks
A few times in the past 12 months
Never or longer than a year ago
City of South Perth
aurecon

Appendix A
Community Survey – CoSP Summary









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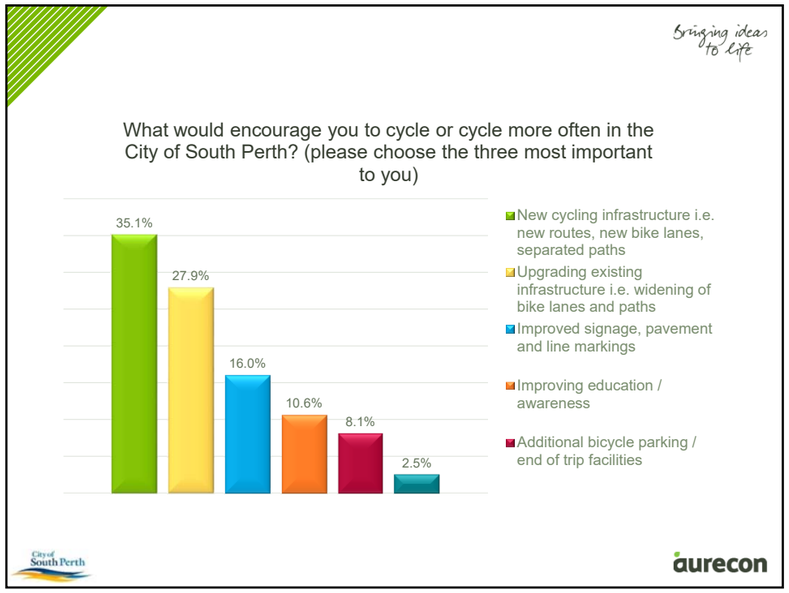
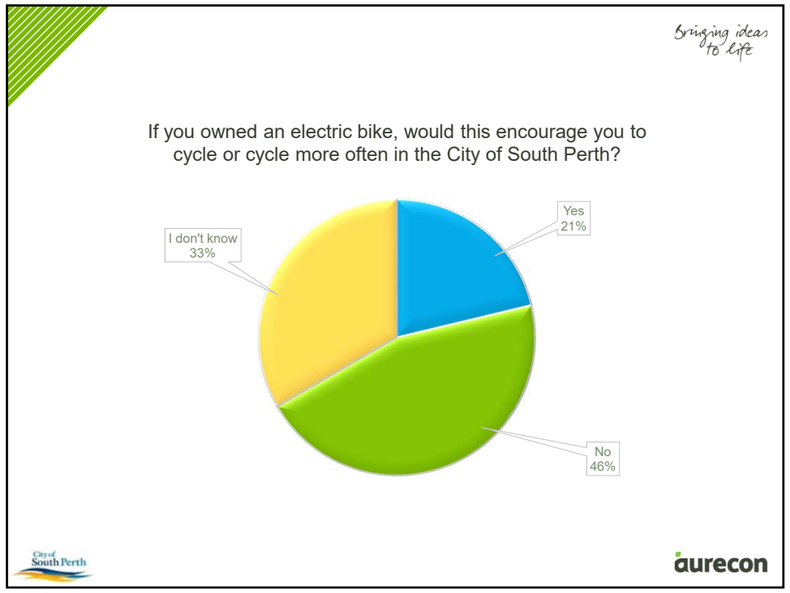
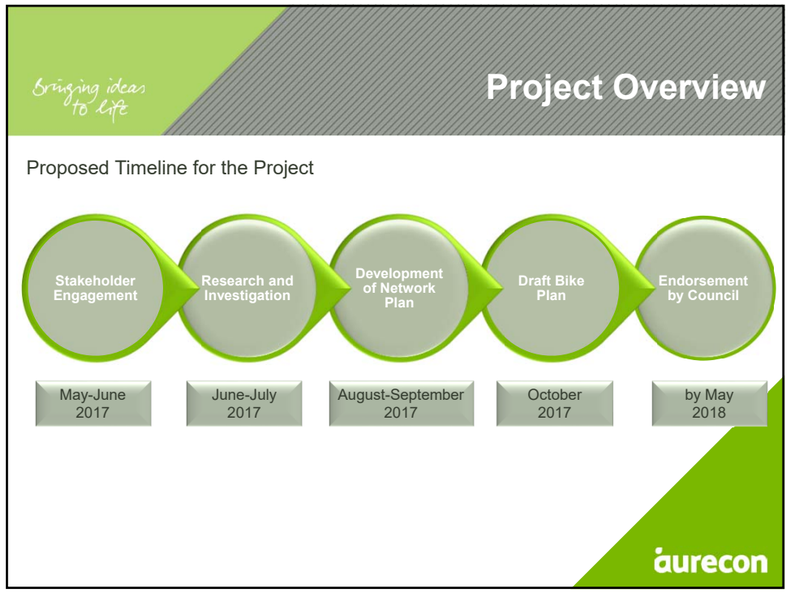
Community Survey – CoSP Summary





Appendix A
Community Design Jam – CoSP Summary



Appendix A
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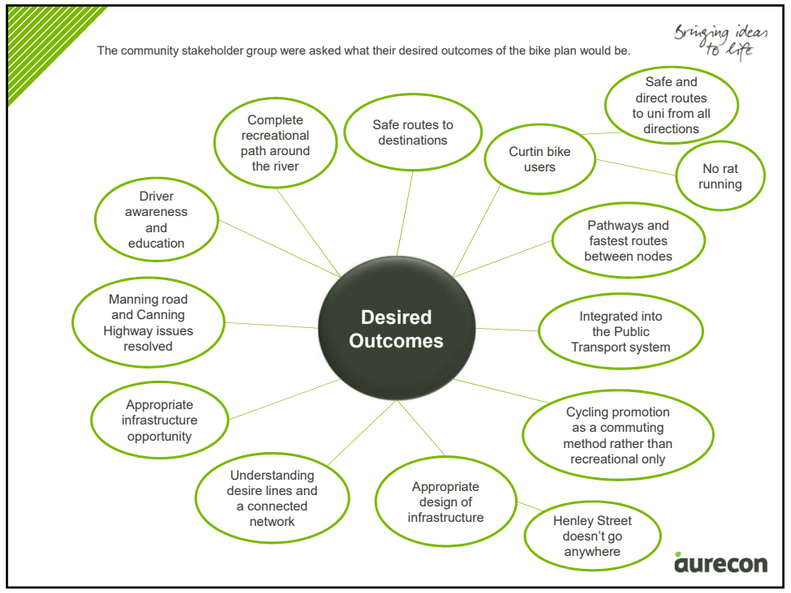

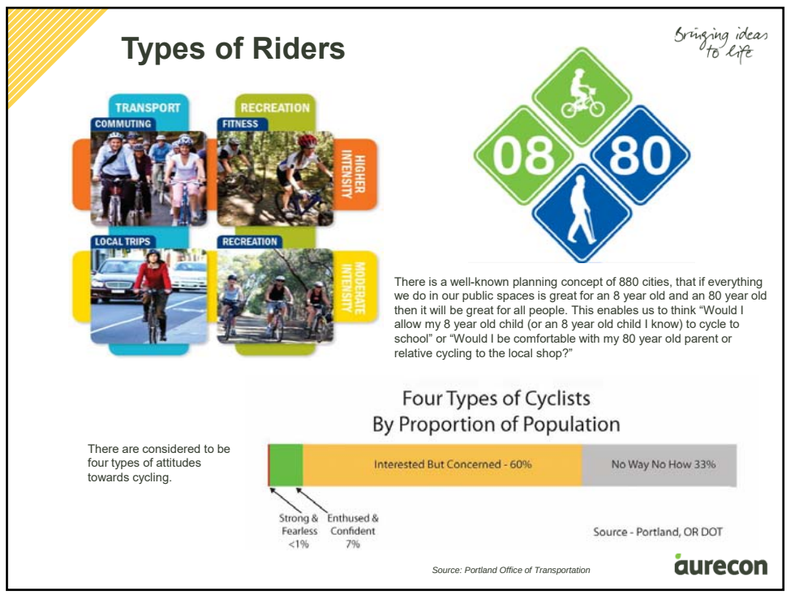

Appendix A
Community Design Jam – CoSP Summary

Cycling Infrastructure

Bringing ideas to life

On-Road Bicycle Lane

Examples of on-road cycling infrastructure include signed on-road bicycle lanes or marked sealed shoulders, and bicycle boulevards which involve transforming low traffic local roads into slow-speed safe active streets for walking and cycling.

Bicycle Boulevard

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Cycling Infrastructure

Bringing ideas to life

Examples of off-road cycling infrastructure include shared paths for cyclists and pedestrians, and separated cycle paths for cyclists only.

Shared Path

Separated Bicycle Path

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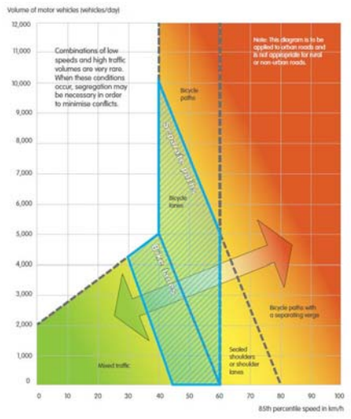
Cycling Infrastructure

Bringing ideas to life

Different types of infrastructure are often preferred for different types of riders, as indicated on the figure on the left.
The right figure identifies traffic volume and speed thresholds in relation to the type of infrastructure that should be installed.

		On-Road Bicycle Lanes	Off-Road Paths
Training		✓	✗
Commuting		✗ ✓	✓
Local trips (i.e. shops, friends)		✗	✓
Recreation		✗	✓
School		✗	✓



Source: adapted from Cycling Aspect of Austroads Guidelines by Bicycle Network Australia

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End of Trip Facilities

Bringing ideas to life

Examples of bicycle parking, including public racks or enclosed storage sheds, like at train stations.

Bicycle Racks

Secure Bicycle Storage

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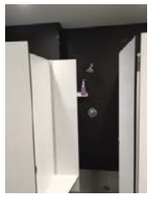
Appendix A
Community Design Jam – CoSP Summary

End of Trip Facilities

bringing ideas to life

Examples of lockers, showers and changing rooms, often located within private facilities such as workplaces.

Lockers



Shower Facilities

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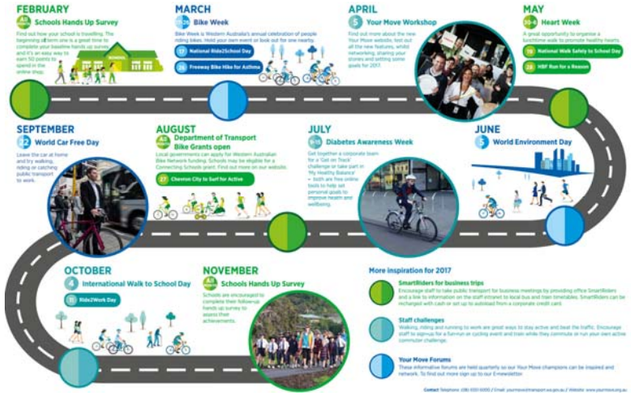
Behaviour Change

Department of Transport

your move – more ways to get there

An important aspect of the bike plan is to investigate soft solutions, which maximise the effectiveness of the harder infrastructure solutions. The DoT runs a very successful behaviour change program called Your Move which helps people find alternative, active ways to get to and from work, school and around their local community. The program has targeted specific local government areas, for example Cockburn, by helping people achieve their active transport goals through providing tailored information and resources as well as personalised coaching and feedback on progress.



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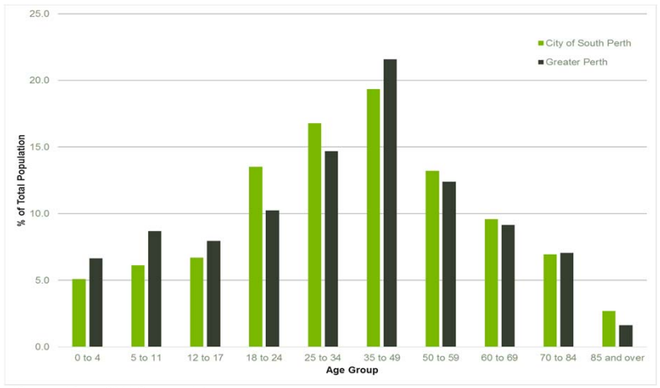
Previous Survey Data

bringing ideas to life

The following survey data specific to the City of South Perth. The graph demonstrates the age profile for City of South Perth residents in comparison to the greater Perth area. Note that this is taken from census data from 2011, with newer 2016 data expected to be released later this year.



*Sourced from 2011 Census data

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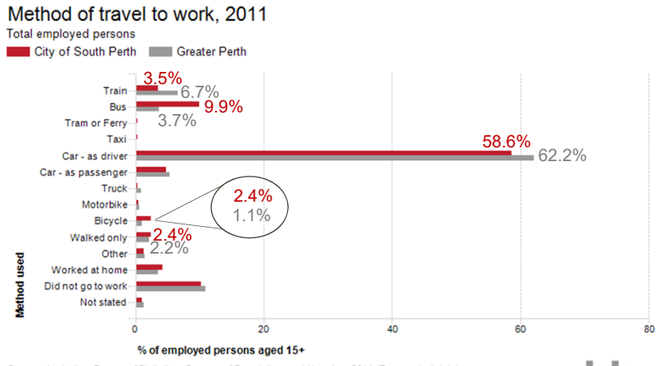
Previous Survey Data

bringing ideas to life

The below graph demonstrates how the City of South Perth residents get to work, with car being the dominant mode choice, as with most of Perth. The graphs shows that 2.4% of residents cycle to work.



Source: Australian Bureau of Statistics, Census of Population and Housing, 2011 (Enumerated data)
Compiled and presented in profile.id by .id, the population experts.

.id the population experts

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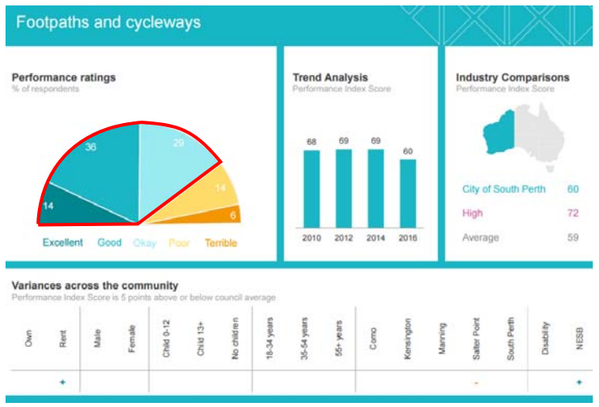
Appendix A
Community Design Jam – CoSP Summary

Previous Survey Data

Bringing ideas to life

The below graphs were taken from the City of South Perth 2016 Community Perception Survey Report. The survey is conducted every 2 years to evaluate and monitor its performance across a range of services and facilities. This highlights that the large portion of the community is at least satisfied with the footpath and cycleways, however it's performance has declined from previous years.



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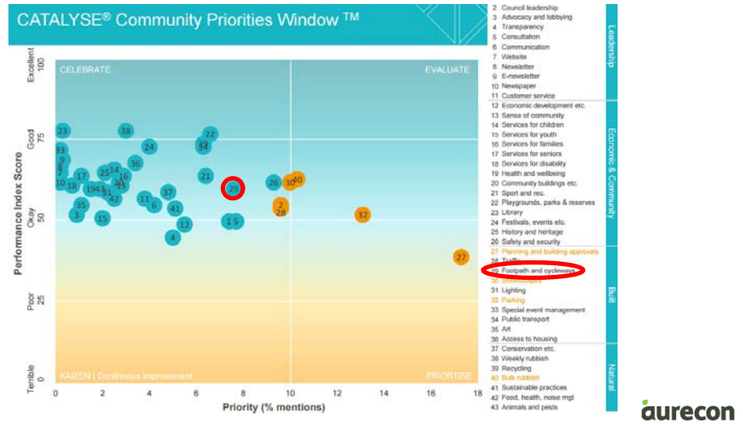
Previous Survey Data

Bringing ideas to life

The graph below demonstrates the community's performance rating of each service on the y-axis, and the priority on the x-axis. The higher, the better performance and the more to the right, the higher priority. Cycling was located in the in the middle, but is one of the highest priorities for the community compared to other services.



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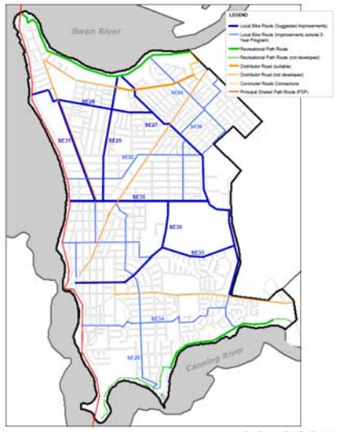
South Perth Bike Plan 2012 - 2017

Bringing ideas to life

The below demonstrates the routes proposed bicycle network in the previous City of South Perth bike plan which was undertaken in 2012. As part of this project, Aurecon will be reviewing the outcomes and progress of the previous Bike Plan.



South Perth Peninsula Place + Design Report

The South Perth Peninsula Place and Design Report identifies a strong focus on cycling in the public realm to improve lifestyle choice and create great streets. One of the five goals for the plan is to promote a mode shift from driving to sustainable transport modes such as cycling.

STAKEHOLDER ENGAGEMENT

LIFESTYLE CHOICE
Provide housing, employment and activity options for people of all ages, family structures and incomes

GREAT STREETS AND SPACES
Revitalize and activate the public realm to create green, useable and enjoyable places for community interaction with a focus on pedestrians and cyclists

IMPROVE MOVEMENT & CONNECTIVITY

Improve movement and access within the Peninsula through a comprehensive approach to traffic and parking management which encourages a modal shift towards walking, cycling and public transit.

IDEA 4:
Holistically address regional traffic congestion, in partnership with key stakeholders

IDEA 5:
Achieve a fully-integrated public transit network, and promote a modal shift from driving to walking, cycling and public transit

IDEA 6:
Deliver a forward-looking, sustainable approach to car parking

IDEA 7:
Renew efforts to deliver the South Perth train station

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Appendix A
Community Design Jam – CoSP Summary

PERTH & PEEL TRANSPORT PLAN

Bringing ideas to life

The WA Transport Portfolio (the Department of Transport, Public Transport Authority and Main Roads) released the Perth and Peel Transport Plan @ 3.5million earlier this year.

In the Plan there are three key cycling network planning principles to be considered.

The Plan outlines a proposed strategic network for Perth, which the Joint Bike Plan will investigate further and help inform.

The Plan outlines four types of cycle routes and the corresponding infrastructure expected for each.

Cycling Network Planning Principles

1. Provide cycling infrastructure in a grid matrix layout
2. Separate cyclists from moving vehicles
3. Separate cyclists from pedestrians

PSPs	Shared paths of high standard, with grade separation at intersecting roads/railways
Strategic Routes	Shared paths of PSP standard (where possible), separated bi-directional cycle lanes, bicycle boulevards
Local Routes	Pavement markings and signage, bicycle boulevards, on-road cycle lanes
RSPs	Shared paths of PSP Standard

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Previous Survey Data

Bringing ideas to life

The below image was taken from Strava maps, the online tool that allows riders to log their cycling trips. The thicker lighter lines represent the heavier used roads. The tool is historically more commonly used for recreational trips, however is still a useful tool to capture the more frequently ridden roads.

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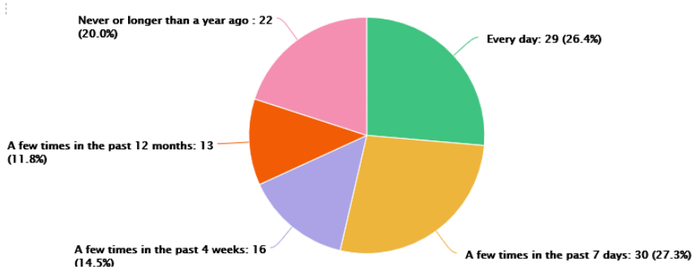
Online Survey Results to Date

Bringing ideas to life

How often do you ride a bike for transport or commuting?

Optional question



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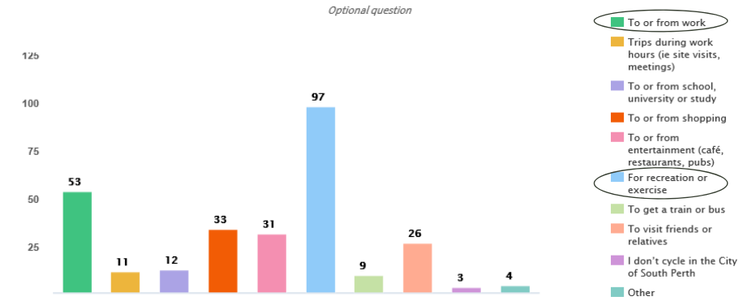
Online Survey Results to Date

Bringing ideas to life

For what purposes do you cycle in the City of South Perth? (please tick all that apply)

Optional question



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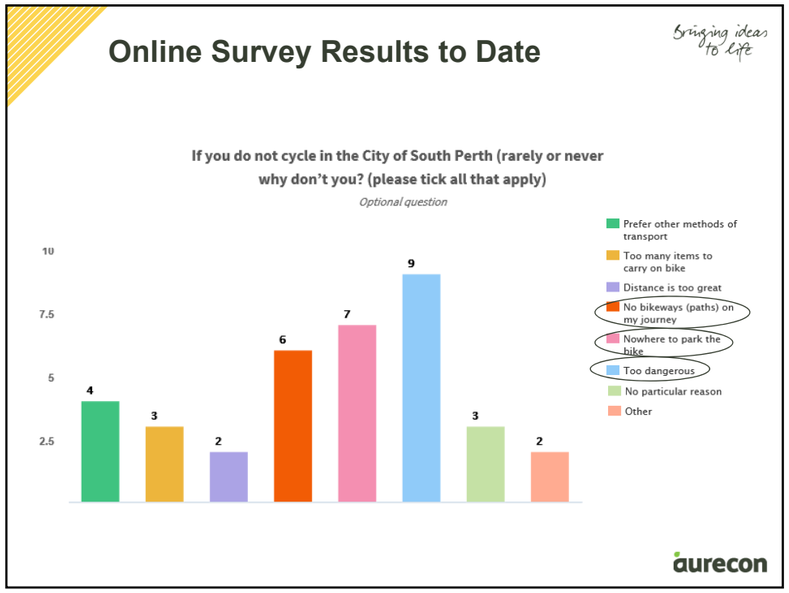
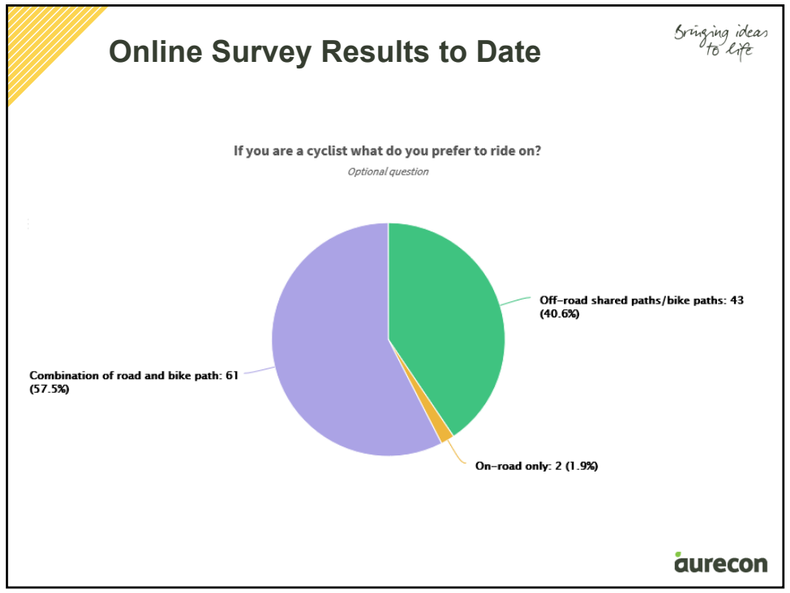
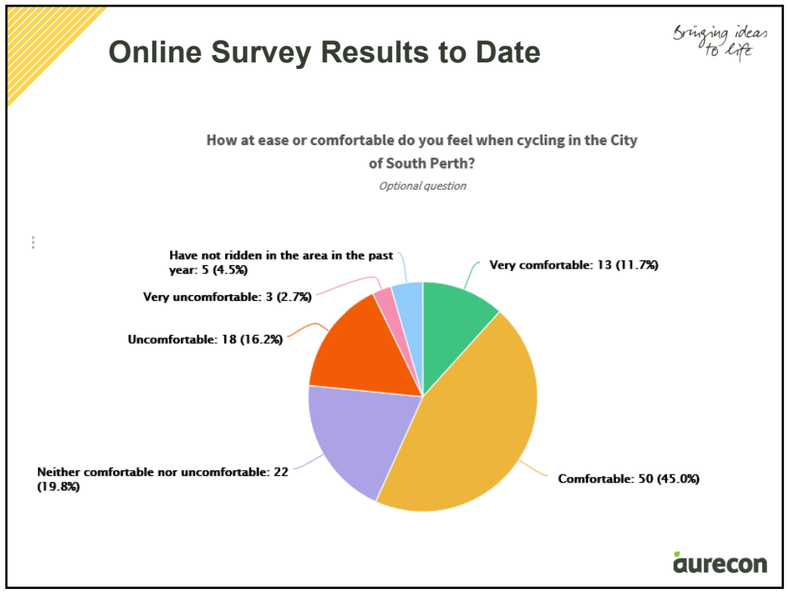
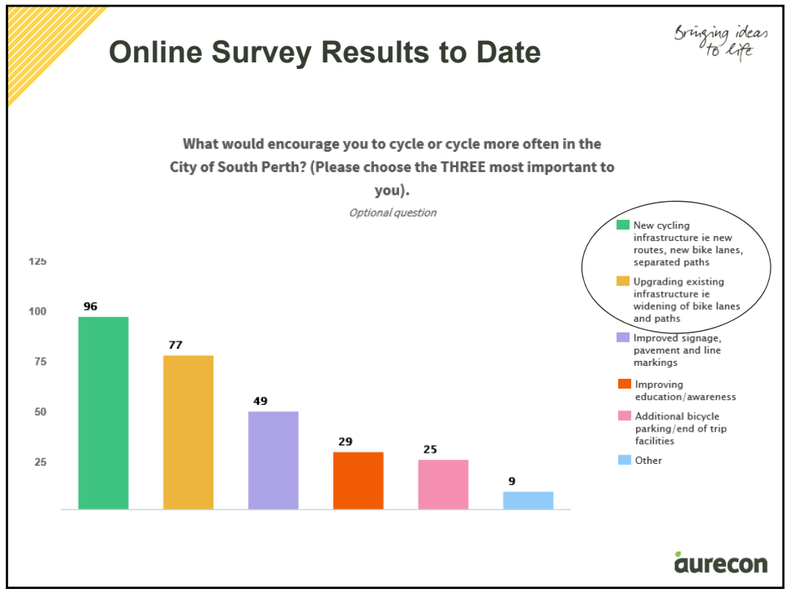
Community Design Jam – CoSP Summary









Appendix A
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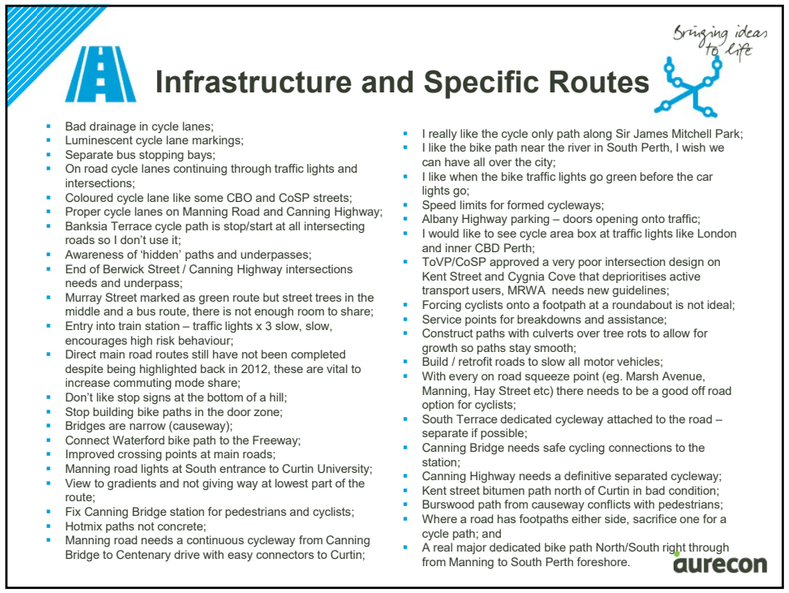
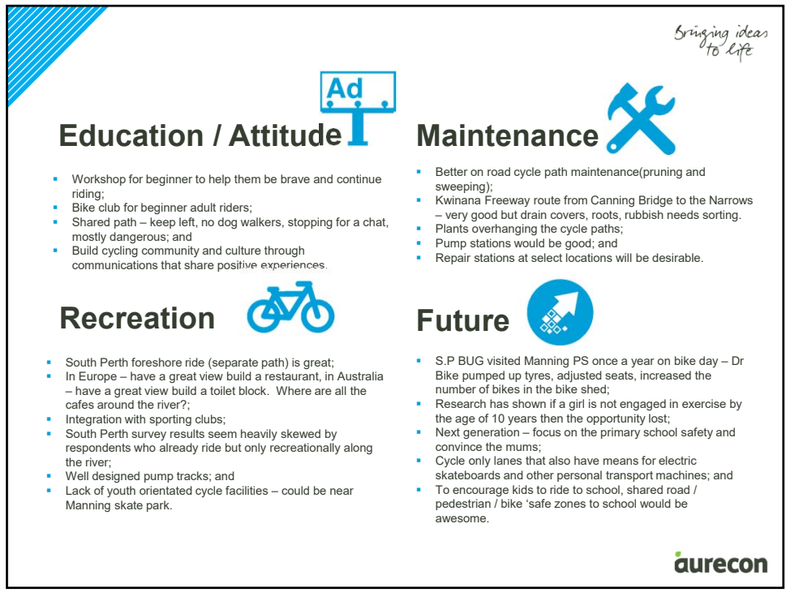




Appendix A
Community Design Jam – CoSP Summary

Council / Policy

- I would like to see integrated connect routes over council boundaries;
- Policing bike baths;
- Relaxed helmet laws;
- 1m and 1.5m passing lanes and remove centre island on roads, allow bikes / vehicles to freely use the available road way;
- Keep bike pin map as ongoing so council can use it as a communication tool;
- Cars parking on cycles. Why mark them if they are ignored by parked cars;
- Mandate that any traffic engineer must commute to work by bicycle and travel in the city by bicycle;
- Route marking regular along rout 300m;
- Reference maps at each end of route and at crossing of routes;
- Council rangers need to enforce no parking over footpaths;
- Cycle lanes next to parked cars need a cross hatched 'door zone buffer';
- Need for standards and uniformity across all local government authorities; and
- Separated pedestrian and bike paths on South Perth are brilliant.

End of Trip

- From Roberts Street overhead bridge into the station is need of more bike cages;
- Lack of cycling friendly entrances and parking at shopping centres and civic buildings including the one in which this workshop was held;
- Shopping centres and sports grounds have a path for cycles to stop but no end of trip facilities;
- Water fountains on bike paths;
- Activity areas such as Mends Street, Preston Street, Angelo Street need more bike racks;
- Long term storage subscriptions for storing transition bikes;
- Build and lease multi-storey (expandable) bike storage at train stations that offer repairs and coffee;
- More bike parking at Canning Bridge station;
- Attach a ½ meter pipe loop to all light poles and street signs near shops etc for parking; and
- Focus on 'little trip' with end of trip facilities – make bike lock ups obvious.

Digital

- Provide mobile alerts and updates aimed at cyclists that provide information about paths and works;
- Strava plug in route planner with accessibility, visibility and connectivity;
- Build online bicycle culture and community; and
- Shift planning to evidence bike planning using IP tracking of cycle routes.

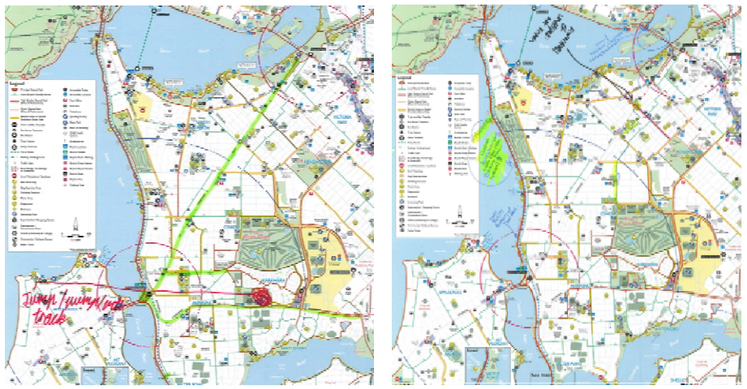
Public Transport

- Encourage integration of bicycles and ferries;
- Non integral of cyclists on public transport; and
- Review integration options for example bike friendly carriage on the train.

Safety

- Canning Highway is a barrier during peak hour to cross;
- Canning Highway is dangerous to approach with kids, new/unstable on bikes;
- The Causeway bridge is very dangerous to cross – is becoming a hindrance for riding around the river;
- High visibility jackets, bright coloured helmets, must have lights;
- Upcoming Vic Park foreshore development mistakenly doesn't separate cyclists and footpaths, there needs to be distance between them;
- South Perth Esplanade has no lanes and problems with cycleway;
- No bikeways or path on Canning Highways – safety issues, if you ride on the footpath risk of impact with cars in driveways, dedicated bike bath on one side.
- Manning road is a barrier for commuting and recreation
- Safe access points on paths for Ambulances
- Make routes safe for all levels of cyclists;
- Causeway – it's a shocker!;
- Children running across bike paths;
- Shared bike pedestrian pathways – pedestrians need to keep left; and
- Exit from Curtin opposite Clontarf campus is a death trap for cyclists heading towards Shelley.

Key Issues and Opportunities Identified



Key Issues

We asked that one person from each group briefly present back the themes or grouped issues you have developed.

During this time we wrote each key theme shared amongst groups on a piece paper to identify the key themed issues.

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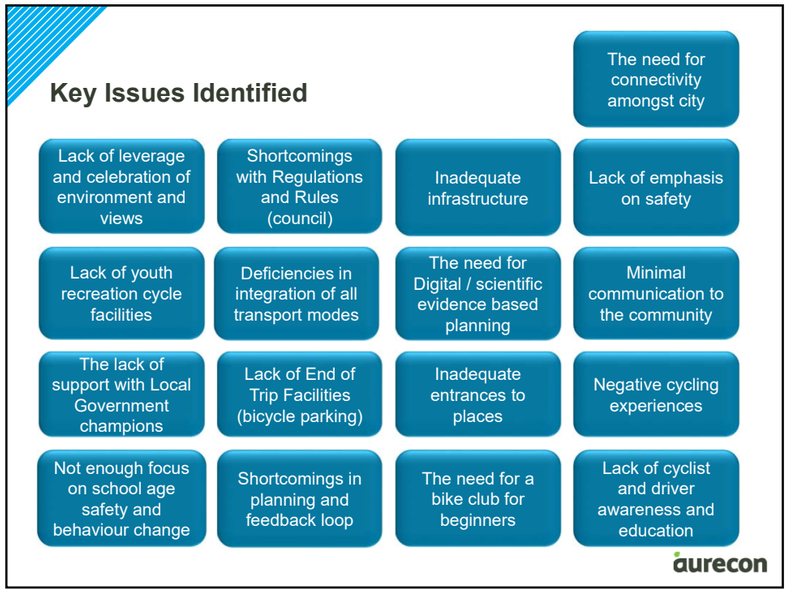
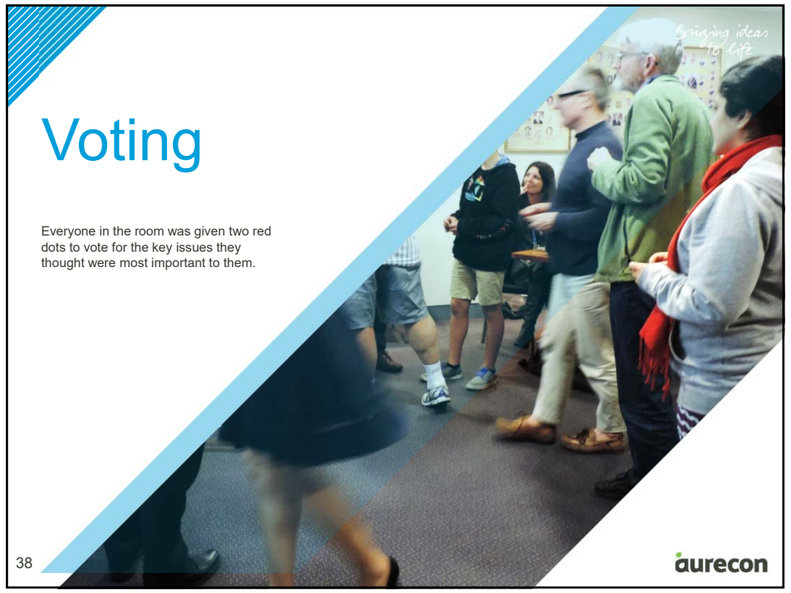
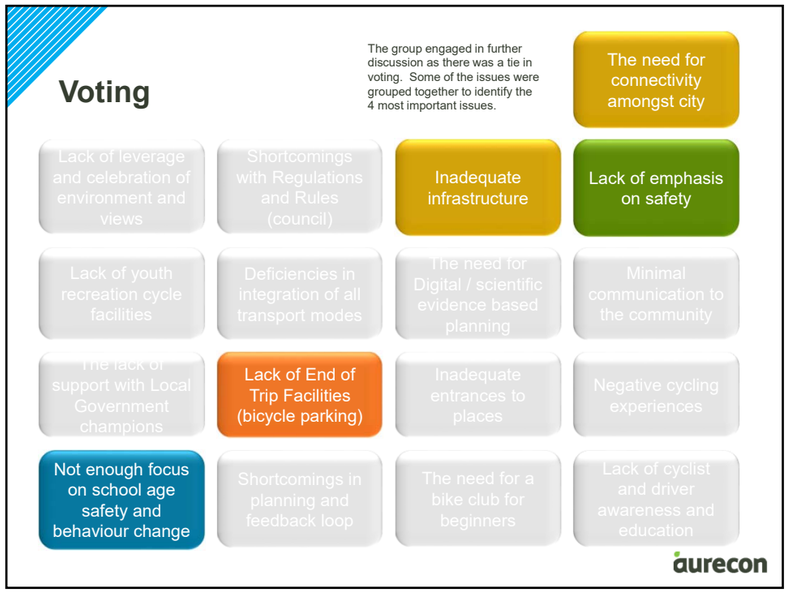
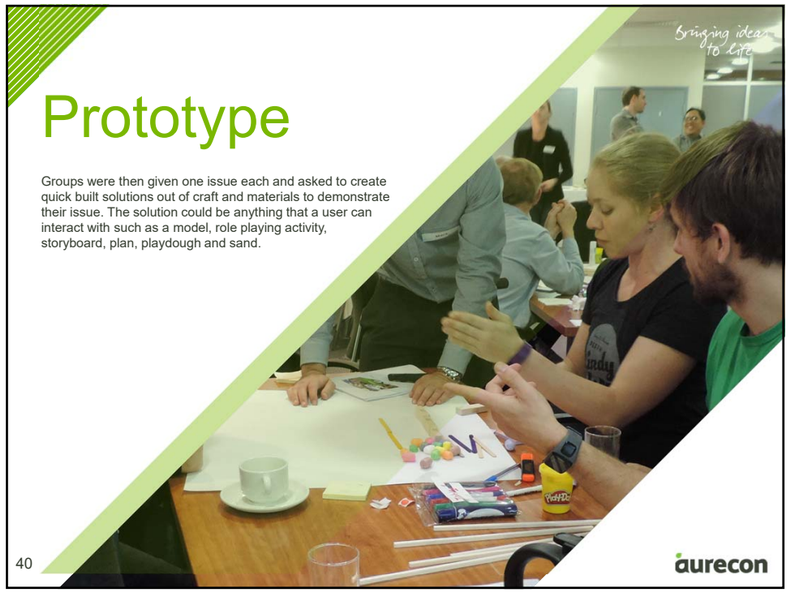
Community Design Jam – CoSP Summary









Appendix A
Community Design Jam – CoSP Summary

Appendix A
Community Design Jam – CoSP Summary

Share

We asked groups to share their prototype with the group and expand on how their idea was developed.

We then asked other members to provide feedback on the prototype. To say what they liked, what they didn't like, what worked, what didn't work and what could be improved.

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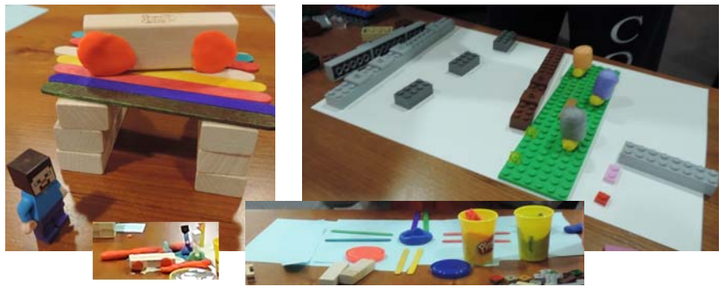
Infrastructure Improvements and Connectivity



- Good design practice to include a separated bike lane;
- Design removes discontinuity of cycle lanes at intersections;
- Through traffic cycle lanes are prioritised over queued traffic;
- Roundabouts are a major issue i.e. Hayman Road, creating a bike lane on a roundabout would be ideal;
- More bridges and underpasses so everyone can move independently;
- More use of advanced bike storage at intersections, in front of vehicles with advanced phases.

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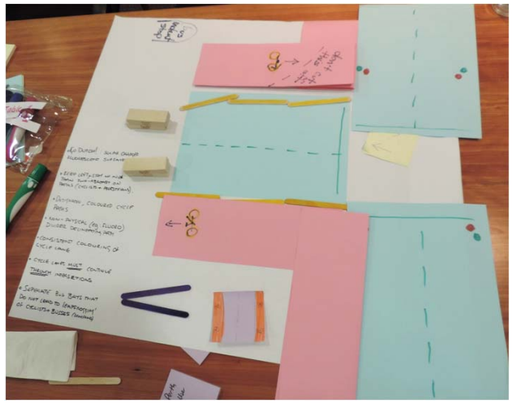
Safety



- Bike lanes stop at intersection, removing conveniences and causing merging safety concern;
- Buses are an issue so a clear demarked bay for buses is needed;
- Solar charged and illuminated path surfaces installed to improve visibility;
- Fluorescent paint that delaminates the edge of the bike path;
- Consistent pavement colour of bike lanes across the whole of Perth to improve familiarity for all users; and
- Signage for education of all modes.

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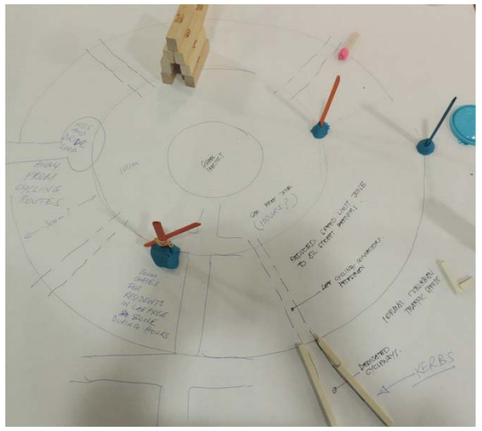
Focus on school age safety and enhance behaviour change



- School in the centre with a car free zone around school (i.e. 500m);
- Slow car speeds (10kmph) for those that surround and have to enter;
- Drop off areas are needed for this to work;
- Feasible because of extra size of perimeter;
- Whole suburb has to be planned in a way that complements this arrangement;
- Cycle ways around the suburb feeding into the zone; and
- Could this be done at Curtin?

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Appendix A
Community Design Jam – CoSP Summary

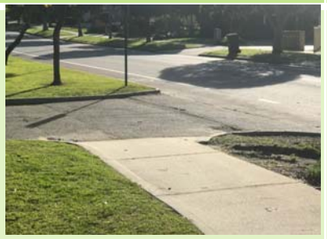
Appendix B – Detailed Infrastructure Audit Results (CoSP)

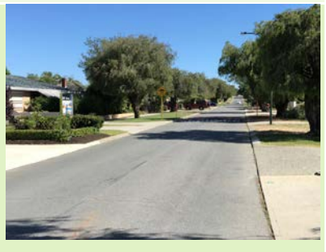
Detailed Link Results for the CoSP

Link Reference	Street Name	Between	Description	Photos	Comments / Issues	Suggestions
L1-A	Kwinana Freeway PSP	Narrows Bridge and Canning Bridge	**Shared Path (off-road)** Approximately 3.0m wide off-road path. The path includes appropriate markings, signage and lighting along most of the alignment.		▪ This provides part of a key route for commuters and recreational cyclists, who visit the Perth CBD. ▪ There is a lack of wayfinding along the path, particularly at overpasses. ▪ Pedestrian demand was highest south of the Thelma Street overpass. ▪ Some sections of the path had debris and overgrown vegetation. ▪ Pavement markings along the route were faded making them barely legible. ▪ Ponding was observed on the shared path that connects to the Freeway Off-Ramp/Mill Point Road crossing approximately 100m south. ▪ There is a lack of wayfinding along the path, particularly at overpasses.	▪ Ensure the PSP is maintained regularly through regular liaison with Main Roads. ▪ Investigate the ponding issues along the connecting shared path 100m south of the Freeway Off-Ramp/Mill Point Road crossing. Install more cycling wayfinding signage, specifically at overpasses, directing users to key destinations within the City of South Perth. This should form part an overall wayfinding strategy (as outlined in Section 8.3.1)
L1-B	Kwinana Freeway PSP	Canning Bridge and Mount Henry Bridge	**Shared Path (off-road)** Approximately 3.0m wide off-road path.		▪ This provides part of a key route for commuters and recreational cyclists, who visit the Perth CBD and area surrounding Canning Bridge. ▪ Centreline line marking is provided along the route. However, the path lacks a solid edge with line marking which reduces visibility. ▪ The pavement surface is cracked and uneven along stretches. ▪ There is no lighting along the path affecting personal security and making the path unappealing during the evening. ▪ Some sections of the path had debris and overgrown vegetation. ▪ There is a lack of wayfinding along the path, particularly at overpasses.	▪ This section of the PSP is a critical component of the cycle network and requires upgrading. The Kwinana Freeway PSP is under the control of Main Roads and as such it is recommended that the CoSP lobby to Main Roads to consider the following: – Review this section of the PSP and investigate the feasibility of separation or path widening. – Resurface existing path and install edge lines to improve demarcation of path. – Install path lighting. ▪ This is further discussed in Section 8.2.9.1.
L2-A	Mill Point Road	Freeway PSP and South Perth Esplanade	**Shared Path (off-road)** Approximately 2.5m wide off-road path which includes appropriate markings and signage.		▪ This provides part of a key route to/from the Perth CBD and South Perth Foreshore and caters for a high demand of a wide variety of users, including pedestrians, and both confident and less confident cyclists. ▪ Poor sight lines exist at the freeway off-ramp/Mill Point Road intersection with the shared path. ▪ Ponding was observed on the shared path on Mill Point Road underneath the Narrows Bridge.	▪ Investigate measures to improve safety and priority for crossing cyclists at the Freeway Off-Ramp/Mill Point Road intersection. Measures could include: – Install traffic calming devices on the off-ramp to slow vehicles down – Install zebra crossing or raised wombat crossing to increase priority for cyclists – Install slowing devices on shared path approaches to slow cyclists down

Link Reference	Street Name	Between	Description	Photos	Comments / Issues	Suggestions
						▪ Liaise with Main Roads and investigate drainage/leaking issue along the Mill Point Road shared path under the Narrows bridge.
L2-B	South Perth Esplanade	Mill Point Road and South Perth Foreshore Path	**Shared Path (off-road)** Approximately 2.2m wide off-road concrete path. A section of 3.0m wide off-road asphalt path is located at the north end.	 	▪ This provides part of a key route to/from the Perth CBD and South Perth Foreshore and caters for a high demand of a wide variety of users, including pedestrians, and both confident and less confident cyclists. ▪ The route also passes through the Mends Street precinct, where the Connect South project is currently in planning. ▪ The existing shared path lacks appropriate markings and signage, and is narrower than a high quality shared path. ▪ Cyclists were observed to be using the road, even though there are no facilities provided. ▪ There is a lack of wayfinding and crossing facilities to Mends Street.	▪ Widen and upgrade the existing shared path to a high quality shared path and install on-road bike lanes, as proposed in the South Perth Esplanade prioritised project (outlined in Section 8.2). ▪ Improve connection from shared path at the east end of South Perth Esplanade with the on-road environment. ▪ Note that part of this route falls within the City's Connect South project.
L2-C	South Perth Foreshore Path	South Perth Esplanade and Ellam Street	**Separated Path (off-road)** Approximately 3.0m wide off-road path. The path includes appropriate markings, signage and lighting along most of the alignment.	 	▪ This provides part of a key route to/from the Perth CBD and South Perth Foreshore and caters for a high demand of a wide variety of users, including pedestrians, and both confident and less confident cyclists. ▪ There a number crossings at carpark access roads, which require cyclists to give way to vehicles (i.e. Coode Street and Douglas Avenue). ▪ Flooding was observed on the path adjacent to the carpark west of Coode Street. ▪ Poor sightlines were observed from the west approach at the Douglas Avenue crossing (looking south east). ▪ There is a lack wayfinding at some crossing points (i.e. Coode Street shared path).	▪ Investigate providing through priority to cyclists at the Coode Street and Douglas Avenue crossings as proposed in the South Perth Esplanade prioritised project (outlined in Section 8.2). This includes: – Providing through priority for cyclists with the use of continuous red asphalt plus zebra crossings, wombat crossings or raised plateaus (or a combination). – Installing traffic calming devices on the road approaches to the cycle crossing to slow vehicles down. – Installing pavement marking and calming devices on the shared path approaches to the intersections to increase awareness and slow cyclists down. ▪ At the west side of the intersection of the foreshore path and Douglas Avenue, investigate removing the two car park bays on the south side, to improve sightlines. ▪ Investigate ponding issue along the path adjacent to the carpark west of Coode Street. ▪ Investigate the installation of adequate wayfinding at key intersection (i.e. Coode Street). This should form part an overall wayfinding strategy (as outlined in Section 8.3.1).

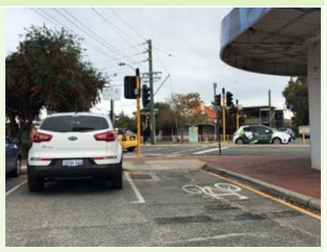
Link Reference	Street Name	Between	Description	Photos	Comments / Issues	Suggestions
L3	Hurlingham Road	South Perth Foreshore and Mill Point Road	**Shared Path (Off-Road) and On-Road (unmarked)** Approximately 2.0m wide off-road concrete path (with asphalt at the northern end). The road currently has no cycling facilities and is generally 9.0m wide. This section is labelled on the previous DoT Your Move Map as a local bicycle friendly route.		▪ This provides a north-south connection from the South Perth Foreshore and Mill Point Road (and further south to Banksia Terrace) ▪ Although the eastern side of the path is signed as a shared path, no dedicated priority for cyclists is provided. ▪ There is a lack of wayfinding along the route.	▪ This route should form part of the long term strategic network as a local route. There is potential for this route to be developed into a Safe Active Street providing a complete north-south connection to the South Perth Foreshore. ▪ Install wayfinding along route particularly at Mill Point Road toward the South Perth Foreshore. This should form part an overall wayfinding strategy (as outlined in Section 8.3.1).
L4-A	Banksia Terrace	Mill Point Road and Canning Highway	**Shared Path (Off-Road) and On-Road (unmarked)** Approximately 2.0m wide off-road concrete path between Mill Point Road and Canning Highway. The road currently has no cycling facilities and is generally 8.0m wide, with two traffic calming devices. This section is labelled on the previous DoT Your Move Map as a local bicycle friendly route. An underpass is located at the intersection with Canning Highway.	 	▪ This provides part of the north-south connection to the South Perth Foreshore ▪ There is a lack of formalised pavement and line marking along the shared path and it is cracked and uneven along sections. ▪ Traffic calming devices put on-road cyclists in dangerous positions as appropriate bypass paths are limited. ▪ The existing underpass is steep, however is critical in providing an uninterrupted crossing at Canning Highway. Improvement to the amenity of the underpass can be undertaken. ▪ There is a lack of wayfinding along the route.	▪ This section of Banksia Terrace does not have any formal cycling infrastructure, with cyclists either riding on-road with traffic or on the footpath. There is potential for this route to be developed into a Safe Active Street in the long term. ▪ In the short term, suitable off-road bypasses at the traffic calming devices should be installed for on-road cyclists. ▪ Improvements to the amenity of the existing underpass should be investigated, i.e. improved lighting and improved pavement markings. ▪ Install wayfinding along the route particularly at the Canning Highway underpass indicating direction and distance to the South Perth Foreshore, and Curtin University. This should form part an overall wayfinding strategy (as outlined in Section 8.3.1).
L4-B	Banksia Terrace	Canning Highway and George Street	**Separated Cycle Only Path (On-Road)** Approximately 3.0m wide protected bi-directional cycle only path between Canning Highway and View Street. The remaining section to George Street is on-road with traffic or a 1.8m concrete path. This section is also labelled on the previous DoT Your Move Map as a local bicycle friendly route.		▪ This provides part of the north-south connection to the South Perth Foreshore, and to Kensington Primary School. ▪ This road has a low traffic volume at approximately 500 vehicles per day. ▪ Existing cycle data of 80 cyclists per day were recorded on the separated path (2014). ▪ The concrete path from Kensington Primary School to George Street is narrow and lacks formalised pavement and line marking. ▪ There is a lack of wayfinding along the route.	▪ The section of Banksia Terrace between View Street and George Street does not have any formal cycling infrastructure, with cyclists either riding on-road with traffic or on the narrow footpath. There is potential for this section to be developed into a Safe Active Street in the long term. ▪ Install wayfinding along route particularly at George Street to the South Perth Foreshore and Curtin University. This should form part an overall wayfinding strategy (as outlined in Section 8.3.1).
L5-A	Thelma Street	Murray Street and Hayman Road	**On-Road (marked) and Pedestrian Only Path (off-road)**		▪ This provides an east-west connection from Hayman Road to Penrhos College.	▪ Remove “pedestrian only” signage from the existing path on the southern side of Thelma Street and install shared path signage and pavement markings.

Link Reference	Street Name	Between	Description	Photos	Comments / Issues	Suggestions
			This road currently has appropriately marked red-asphalt on-road bike lanes and consists of a good surface quality. Two traffic calming devices are located along the road with off-road bypass paths generally provided. Approximately 2.5m wide off-road path is currently signed as a pedestrian only path.	 	▪ The pedestrian only path is of adequate width and can cater for less confident cyclists using this strategic route. It also connects well to the existing shared path along Hayman Road and continuing along Thelma Street. ▪ An existing off-road bypass at the traffic calming device just east of Murray Street for westbound cyclists does not transition smoothly onto the bike lane. ▪ Westbound cyclists crossing Murray Street do not have an off-road bypass available. ▪ There is a lack of wayfinding along the route.	▪ Install a westbound off-ramp with smooth transition at the traffic calming device just east of Murray Street. ▪ At the Thelma Street/Murray Street intersection investigate the installation of an off-road bypass path with smooth transition at the westbound approach of the intersection. This should connect to the existing crossing point. ▪ Install wayfinding along route particularly at the Murray Street and Hayman Road intersections. This should form part an overall wayfinding strategy (as outlined in Section 8.3.1).
L5-B	Thelma Street	Throssell Street and Murray Street	**Shared Path (off-road)** Approximately 2.5m wide off-road path which includes appropriate markings and signage.		▪ This section provides an east-west connection through to Penrhos College. ▪ The connection with the west end of the Penrhos College carpark and Throssell Street is a challenging location for cyclists travelling east-west to navigate. The existing shared path leads cyclists into the carpark, which increases chances of conflicts with vehicles and pedestrians, particularly during school peak periods. Several kerbs also act as obstructions.	▪ Investigate improvements to the connection between the west end of the Penrhos College car park and Throssell Street, as proposed in the Thelma Street prioritised project (outlined in Section 8.2). Liaison with Penrhos College will be required.
L5-C	Thelma Street	Canning Highway and Morrison Street	**On-Road (unmarked)** The road currently has no cycling facilities and is generally 7m wide. This section is labelled on the previous DoT Your Move Map as a local bicycle friendly route.		▪ This section provides an east-west connection between Canning Highway and Penrhos College. ▪ Parked cars on both sides cause cyclist deviation into traffic. ▪ Thelma Street is a cul-de-sac east of Canning Highway, supporting on-road cycling.	▪ The section does not have any formal cycling infrastructure, with cyclists either riding on-road with traffic or on the narrow footpath. There is potential for this section to be developed into a safe active street in the long term.
L5-D	Thelma Street	Labouchere Road and Canning Highway	**On-Road (marked) and On-Road (sealed shoulder)** Some of the road currently has appropriately marked red-asphalt on-road bike lanes. The remaining 180m section to Canning Highway is not sealed with red asphalt nor marked as cycle lanes.		▪ This section provides an east-west connection across the signalised Canning Highway intersection connecting to the Kwinana Freeway PSP. It also provides a direct connection to the strategic north-south routes along Labouchere Road and Coode Street. ▪ Currently on-road sealed shoulders are provided along this section, however approximately 180m section is not sealed with red asphalt nor marked as cycle lanes. ▪ Eastbound traffic at Canning Highway was observed to queue on the Thelma Street approach, with vehicles encroaching on the existing sealed	▪ It is recommended that when the next resurfacing works along Thelma Street are undertaken that this entire section of on-road cycle lanes is reviewed. The cycle lanes should be sealed in red asphalt at a minimum width of 1.5m and it is recommended that plastic kerbing is installed as a separator. In addition, green asphalt should be used for the cycle lanes across all side intersections. Where possible, the existing traffic lane width should be narrowed to the minimum possible to facilitate a wider cycle lane. ▪ Protection for the on-road cycle lanes is particularly important at the approach to the Canning Highway intersection, where there is the largest risk of conflict. Advanced stop cycling boxes are recommended to be investigated and installed at the eastbound approach during the next resurfacing works.

Link Reference	Street Name	Between	Description	Photos	Comments / Issues	Suggestions
					shoulder. On-road cyclists are therefore put into a dangerous position. ▪ Westbound cyclists do not have an appropriate off-road bypass at the Thelma Street/ Labouchere Road intersection.	▪ The following improvements are recommended at the Thelma Street/ Labouchere Road intersection: – Install off-road bypass path with smooth transition on the east approach for westbound cyclists – Install holding rails at all median crossings at the intersection
L5-E	Thelma Street	Melville Parade and Labouchere Street	Apart from a small section of sealed shoulders west of Labouchere Road, the road currently has no cycling facilities and is generally 9.0m wide. This section is labelled on the previous DoT Your Move Map as a local bicycle friendly route.		▪ This section provides an east-west connection between Canning Highway and the Kwinana Freeway overpass. ▪ This section of road includes a steep hill of considerable length. ▪ This section carries low traffic volumes, and caters for a bus route. ▪ A sealed shoulder exists but disappears after approximately 100m. Cars were observed to park in the sealed shoulder.	▪ The section does not have any formal cycling infrastructure, with cyclists either riding on-road with traffic or on the narrow footpath. There is potential for this section to be developed into a Safe Active Street in the long term. ▪ The installation of a formal pedestrian/cyclist crossing is recommended to connect directly to the PSP overpass.
L6-A	Welwyn Avenue	Manning Road and Hope Avenue	**On-Road (marked**) This road currently has appropriately marked red-asphalt on-road bike lanes. It has an approximately 1.6m wide central median and consists of a good surface quality.	 	▪ This section provides a key north-south connection through Manning and to/from Salter Point. ▪ Existing traffic volumes along the road are approximately 5,000 vehicles per day and the speed limit is 50km/hr. ▪ There is a gap in a small section of on-road cycle lane in the southbound direction just south of Griffin Crescent where some on-street parking spaces are provided. This puts cyclists into a dangerous position to merge with into the traffic lane. ▪ There is a lack of wayfinding along the route.	▪ Welwyn Avenue/Bradshaw Crescent intersection – Install yellow bicycle pavement symbols in the centre of the approach lane to increase awareness of confident cyclists wishing to travel through the roundabout ▪ Welwyn Avenue/Conochie Crescent intersection – Install yellow bicycle pavement symbols in the centre of the approach lane to increase awareness of confident cyclists wishing to travel through the roundabout ▪ Continue the on-road cycle lane in the southbound direction at Griffin Crescent to fill the existing gap. This will require the indentation of parking bays into the existing verge. ▪ Welwyn Avenue/Hope Avenue intersection – Install off-road bypass paths with smooth transitions on the Welwyn Avenue approaches ▪ Install wayfinding along the route particularly at Manning Road and Manning shops/Community Hub. This should form part an overall wayfinding strategy (as outlined in Section 8.3.1).
L6-B	Welwyn Avenue	Hope Avenue and Unwin Crescent	**On-Road (unmarked)** The road currently has no cycling facilities and is generally 6.5m wide and is labelled on the previous DoT Your Move Map as a local bicycle friendly route.		▪ This provides a north-south connection through Manning and to/from Salter Point. ▪ Existing traffic volumes along the road are approximately 1,500 vehicles per day and the speed limit is 50km/hr. ▪ A bus service is located on the road at the south end. ▪ Several raised pavement traffic calming devices are located along the road.	▪ This route should form part of the long term strategic network as a strategic route. As part of any future resurfacing works, formalise on-street parking and investigate the installation of Safe Active Streets treatments (i.e. formalised parking and red pavement). This will also require changing priority at the Unwin Crescent intersection.

Link Reference	Street Name	Between	Description	Photos	Comments / Issues	Suggestions
L7-A	Manning Road	Centenary Avenue and Kent Street	**Shared Path (Off-Road)** Approximately 2.5m wide off-road concrete path along the south side of Manning Road. Approximately 2.0m wide off-road concrete path along the north side of Manning Road, which is within ToVP and not referred to here.	 	▪ This is a strategic east-west connection across the southern section of South Perth to Curtin University and neighbouring councils. ▪ Existing traffic volumes along the road are approximately 32,000 vehicles per day and the speed limit is 70km/hr. This creates an unsuitable environment for on-road cycling. ▪ The existing concrete paths is narrow at sections and lacks formalised pavement and line marking. ▪ There is a lack of adequate crossing facilities to Curtin University, particularly at Manning Road/Curtin University South entrance intersection.	▪ In collaboration with ToVP, upgrade existing crossing facilities at the Curtin University South entrance and Kent Street intersections, as proposed in the Manning Road prioritised project (outlined in Section 8.2). ▪ Spray the existing footpath on the south side with red paint and formalised pavement and line marking, as proposed in the Manning Road prioritised project (outlined in Section 8.2). ▪ Install wayfinding along the route particularly at Kent Street and the Curtin University South entrance. This should form part an overall wayfinding strategy (as outlined in Section 8.3.1).
L7-B	Manning Road	Kent Street and Welwyn Avenue	**Shared Path (Off-Road)** Approximately 1.6 to 2.0m wide off-road concrete path along the north side of Manning Road. Approximately 1.6m wide off-road concrete path along the south side of Manning Road except between Elderfield Road and Cashel Way, where there is no path.	 	▪ This is a strategic section provides an east-west connection across the southern section of South Perth and provides a connection to Curtin University and neighbouring councils. As a result, there is a strong demand for this route to be improved. ▪ This road has a high traffic volume at approximately 32,000 vehicles per day and the speed limit is 60 to 70km/hr. This creates an unsuitable environment for on-road cycling. ▪ The existing concrete paths are narrow and lack formalised pavement and line marking. ▪ There is a gap along the shared path on south side, with approximately 500m of missing path between Elderfield Road and Cashel Way. ▪ There is a lack of adequate crossing facilities, particularly at the Welwyn Avenue and Elderfield intersections.	▪ Install 3.0m shared path on the south side of Manning Road between Elderfield Road and Cashel Way, as proposed in the Manning Road prioritised project (outlined in Section 8.2). ▪ Replace the existing path on the south side of Manning Road between Elderfield Road and Welwyn Avenue with a new 2.5m-3.0m red asphalt path as proposed in the Manning Road prioritised project (outlined in Section 8.2). ▪ Install pedestrian/cyclist crossing facilities at the Elderfield Road and Welwyn Avenue intersections, as proposed in the Manning Road prioritised project (outlined in Section 8.2). ▪ Install wayfinding along the route particularly toward Curtin University. This should form part an overall wayfinding strategy (as outlined in Section 8.3.1).
L7-C	Manning Road	Welwyn Avenue and Ley Street	**Shared Path (Off-Road)** Approximately 1.6 to 2.0m wide off-road concrete path along the north side of Manning Road. Approximately 1.6m wide off-road concrete path along the south side of Manning Road except between Elderfield Road and Cashel Way, where there is a 500m gap.		▪ This is a provides part of the east-west connection across the southern section of South Perth, connecting with Ley Street and Welwyn Avenue. ▪ This road has a high traffic volume at approximately 32,000 vehicles per day. ▪ The existing concrete paths are narrow and lack formalised pavement and line marking. ▪ Several issues were raised for crossing at the Manning Road/Ley Street intersection. ▪ Some sections of the path had debris and overgrown vegetation.	▪ Manning Road/Ley Street intersection – Install holding rails at all median crossings at the intersection – Investigate the provision of cyclist advanced stop boxes at the north, south and east approaches – Install a pram ramp at the east end of Wooltana Street to allow a convenient connection to the intersection ▪ Install wayfinding along the route particularly toward Curtin University and Canning Bridge. This should form part an overall wayfinding strategy (as outlined in Section 8.3.1).

Link Reference	Street Name	Between	Description	Photos	Comments / Issues	Suggestions
L8-A	Davilak Street	Canning Bridge and Ley Street	**Sealed Shoulder (on-road)** Approximately 1.5m on-road bike lanes (sealed shoulder), which discontinue at some intersections.		▪ This provides a part of an east-west connection between Curtin University and Canning Bridge Station. ▪ Existing traffic volumes are below 1,500 vehicles per day and the posted speed is 50km/hr. ▪ This section caters for bus routes. ▪ Perpendicular parking on north verge is provided along McDougall Park. ▪ On-road bike lanes are surfaced with red asphalt but are not marked with bike symbols or signage. ▪ On-road bike lanes discontinue at the Robert Street intersection. There is also a lack of off-road bypass options on the approaches and departures for cyclists travelling through the Ley Street roundabout. ▪ There is a lack of wayfinding along the route.	▪ This route forms part of the Canning Bridge to Curtin Cycle Link. This is proposed to include the installation of a bi-directional cycle path, as proposed in the Canning Bridge to Curtin Bicycle Link prioritised project (outlined in Section 8.2). ▪ Install wayfinding along the route particularly toward Curtin University and Canning Bridge. This should form part of an overall wayfinding strategy (as outlined in Section 8.3.1).
L8-B	Davilak Crescent/ Godwin Avenue	Ley Street and Henley Street	**On-Road (unmarked)** The road currently has no cycling facilities and is generally 6.0 wide. This road is labelled on the DoT Cycle Map as a local bicycle friendly route.	 	▪ This provides a part of an east-west connection between Curtin University and Canning Bridge Station. ▪ This route carries low traffic volumes and the posted speed is 50km. ▪ Perpendicular parking is located along the south verge. ▪ A roundabout is located at Canavan Crescent, and no priority is provided at Bickley Crescent. ▪ There is a lack of formalised parking along the streets. ▪ There is a lack of wayfinding along the route.	▪ This route is part of the Canning Bridge to Curtin Cycle Link. This is proposed to include developing Davilak Crescent into a Safe Active Street as proposed in the Canning Bridge to Curtin University Cycle Link prioritised project (outlined in Section 8.2). ▪ Upgrade the connection from Godwin Avenue to Henley Street as part of the above works to provide a direct connection for cyclists. ▪ Install wayfinding along the route particularly toward Curtin University and Canning Bridge. This should form part of an overall wayfinding strategy (as outlined in Section 8.3.1).
L8-C	Jackson Road	Henley Street to Kent Street	**Separated Path (off-road) and Shared Path (off-road)** Approximately 3.5m wide off-road separated/ cycle only path between Henley Street and Jackson Road, and 2.5 to 3.0m shared path along Jackson Road.		▪ This provides a part of an east-west connection between Curtin University and Canning Bridge Station. ▪ There is no lighting along the separated path affecting personal security and making it unappealing during the evening. ▪ The existing permanent cycle counter located along the separated path has recorded a daily volume of 80 vehicles per day. ▪ The pedestrian path located adjacent to the separated path lacks signage and pavement	▪ This route is part of the Canning Bridge to Curtin University Cycle Link. This is proposed to include the following: – Installation of a bi-directional cycle path and separate pedestrian path along Jackson Road, as proposed in the Canning Bridge to Curtin University Cycle Link prioritised project (outlined in Section 8.2). – As part of the above works, modify the connection from the existing separated path to the proposed Jackson Avenue path to provide a direct connection for cyclists. Lighting should also be improved along the entire off-road route.

Link Reference	Street Name	Between	Description	Photos	Comments / Issues	Suggestions
					markings indicating that the path is primarily for pedestrians. ▪ Some sections of the separated path had debris and overgrown vegetation. There is also a lack of lighting along affecting personal security and making the path unappealing during the evening. ▪ Jackson Road carries low traffic volumes and the posted speed is 50km/hr. ▪ The pavement surface along Jackson Road is uneven along stretches. Debris and overgrown vegetation were along most of the path edge. ▪ There is a lack of wayfinding along the route.	– Install signage and pavement markings indicating the desired pedestrian only use of the path adjacent to the separated path. ▪ Ensure the paths are maintained regularly. ▪ Install wayfinding along the route particularly toward Curtin University and Canning Bridge. This should form part of an overall wayfinding strategy (as outlined in Section 8.3.1).
L9-A	Lawler Avenue/Tate Street	Mill Point Road and Lawler Street	**Bicycle Lane (on-road)** Approximately 1.5m on-road bike lanes. and is labelled on the previous DoT Your Move Map as a local bicycle friendly route.		▪ This provides part of a north-south connection between Curtin University and the South Perth foreshore. ▪ This route carries low traffic volumes and the posted speed is 50km/hr. ▪ Lighting is lacking along the route. ▪ The on-road bike lanes discontinue at the Lawler Street intersection. ▪ The existing bike lane on the west side is observed to have parked vehicles on it. The existing bike lane on the east side is adjacent to parallel parking, and is in the door zone. ▪ There is a lack of wayfinding along the route.	▪ Install bidirectional cycle path and formalise parking along this section of Tate Street, as proposed in the Douglas Avenue prioritised project (outlined in Section 8.2). ▪ Install a raised plateau at the Lawley Street intersection with a north-south crossing, as proposed in the Douglas Avenue prioritised project (outlined in Section 8.2). ▪ Install wayfinding along the route particularly at Douglas Avenue. This should form part of an overall wayfinding strategy (as outlined in Section 8.3.1).
L9-B	Lawler Street/Tate Street	Tate Street and Canning Highway	**On-Road (unmarked)** The road currently has no cycling facilities and is generally 7.0m wide and is labelled on the previous DoT Your Move Map as a local bicycle friendly route.		▪ This provides part of a north-south connection between Curtin University and the South Perth foreshore. ▪ This route carries low traffic volumes and the posted speed is 50km/hr. ▪ Lighting is lacking along sections of the route. ▪ There is a lack of wayfinding along the route.	▪ Develop Lawler Street into a Safe Active Street, as proposed in the Douglas Avenue prioritised project (outlined in Section 8.2). ▪ Install wayfinding along the route particularly at Angelo Street and Canning Highway. This should form part of an overall wayfinding strategy (as outlined in Section 8.3.1)
L10-A	Douglas Avenue/ Hayman Road	South Perth Foreshore and Mill Point Road	**On-Road (unmarked)** The road currently has no cycling facilities and is generally 10.0m wide.		▪ This provides a part of a north-south connection between Curtin University and the South Perth foreshore. ▪ This route carries low traffic volumes and the posted speed is 50km/hr. ▪ There is a lack of lighting along some sections of the road. ▪ A significant amount of formalised parking is located along the road, particularly one the west side. ▪ There is a lack of wayfinding along the route	▪ Investigate providing through priority to cyclists at the Douglas Avenue crossings with the Foreshore Path, as proposed in South Perth Esplanade prioritised project (as outlined in Section 8.2). ▪ Formalise the connection of Douglas Avenue and Mill Point Road, and Tate Street and Mill Point Road, as proposed in the Douglas Avenue prioritised project (outlined in Section 8.2). ▪ Install wayfinding along the route particularly at Mill Point Road. This should form part of an overall wayfinding strategy (as outlined in Section 8.3.1).

Link Reference	Street Name	Between	Description	Photos	Comments / Issues	Suggestions
L10-B	Douglas Avenue/ Hayman Road	Mill Point Road and Canning Highway	**On-Road (unmarked)** The road currently has no cycling facilities and is generally 7.0m wide, with several traffic calming devices.		▪ This provides a part of a north-south direction connection between Curtin University and the South Perth foreshore ▪ This route carries traffic volumes 8,000 vehicles per day and the posted speed is 50km/hr. ▪ There are several locations along the route where the traffic calming devices put cyclists in dangerous positions with general traffic. ▪ It is inconvenient for southbound travelling cyclists to utilise Douglas Avenue from Lawler Street.	▪ Investigate improving the north-south connection for cyclists across Canning Highway in collaboration with Main Roads, as proposed in the Douglas Avenue prioritised project (outlined in Section 8.2).
L10-C	Douglas Avenue/ Hayman Road	Canning Highway and George Street/ South Terrace	**Sealed Shoulder (on-road)** Approximately 1.5m on-road bike lanes.		▪ This provides a part of a north-south direction connection between Curtin University and the South Perth foreshore ▪ This route carries traffic volumes 11,000 vehicles per day and the posted speed is 60km/hr. ▪ Currently on-road bike lanes/ sealed shoulders are provided with red asphalt surfacing, however they are not marked as cycle lanes, and are narrow near the South Terrace/ George Street intersection ▪ The on-road bike lanes do not span the entire length to the Canning Highway intersection, and lack suitable options to enter/exit the roadway. ▪ There is a lack formalised pedestrian/cyclist crossing on all approaches of the South Terrace/ George Street intersection. ▪ There is a lack of wayfinding along the route.	▪ Upgrade the existing sealed shoulder to protected formal on-road cycle lanes, as proposed in the Douglas Avenue prioritised project (outlined in Section 8.2). ▪ Extend on-road bike lanes to the Canning Highway intersection and install an advanced cyclist stop box in the northbound direction on the approach to the Canning Highway, as proposed in the Douglas Avenue prioritised project (outlined in Section 8.2). ▪ It is inconvenient for southbound travelling cyclists to utilise Douglas Avenue from Lawler Street. Investigate improving the north-south connection for cyclists across Canning Highway in collaboration with Main Roads. ▪ Install off-road bypass paths with smooth transitions at the on-road bike lanes where they discontinue/begin. ▪ Install dedicated crossing facilities and advanced stop cyclist boxes on all approaches at the South Terrace/ George Street intersection, as proposed in the Douglas Avenue prioritised project (outlined in Section 8.2). ▪ Install wayfinding along the route particularly at Canning Highway and South Terrace/ George Street. This should form part an overall wayfinding strategy (as outlined in Section 8.3.1)
L10-D	Douglas Avenue/ Hayman Road	George Street/ South and Kent Street	**Sealed Shoulder (on-road) and Shared Path (off-road)** Approximately 1.5m on-road bike lanes. A shared path runs along the west side of Hayman Road.		▪ This provides a part of a north-south direction connection between Curtin University and the South Perth foreshore ▪ This route carries traffic volumes below 22,000 vehicles per day and the posted speed is 60 to 70km/hr. ▪ Currently on-road red asphalt sealed shoulders are provided, however they are not marked as cycle lanes on the west side and are not surfaced red or marked as cycle lanes on the east side. ▪ The existing path connection to Bessel Avenue is lacking adequate width and shared path pavement and line markings.	▪ Review on-road cycle lanes as part of next resurfacing works, as proposed in the Douglas Avenue prioritised project (outlined in Section 8.2). ▪ Upgrade existing path to a 2.5m-3.0m red asphalt shared path, as proposed in the Douglas Avenue prioritised project (outlined in Section 8.2). ▪ Upgrade the shared path connection at Bessell Avenue to facilitate enhanced access, as proposed in the Douglas Avenue prioritised project (outlined in Section 8.2). ▪ Install off-road bypass in east-bound direction on the Hayman Street approach at the Kent Street roundabout, as proposed in the Douglas Avenue prioritised project (outlined in Section 8.2).

Link Reference	Street Name	Between	Description	Photos	Comments / Issues	Suggestions
				 	▪ There is lack of an adequate off-road bypass path for eastbound cyclists at the Kent Street approach. ▪ There is a lack of wayfinding along the route.	▪ Install wayfinding along the route particularly at Bessel Avenue and Kent Street. This should form part an overall wayfinding strategy (as outlined in Section 8.3.1)
L11	Labouchere Road	Mill Point Road and Canning Highway	**Bicycle Lanes (on-road** Approximately 1.5m on-road bike lanes, which discontinue north of Angelo Street.	 	▪ This provides part of a north-south direction connection between Como and Mill Point/South Perth Foreshore. ▪ This route carries traffic volumes generally below 13,000 vehicles per day and the posted speed is 60km/hr. ▪ This is a high frequency bus route which creates potential conflicts for on-road cyclists at bus stops. ▪ There is an existing gap between Mill Point Road and Angelo Street which does not have on-road bike lanes. ▪ The existing on-road bike lanes are marked with bike symbols between Angelo Street and Canning Highway, but the sections between Hensman Street and South Terrace, and Saunders Street and Canning Highway are not surfaced with red asphalt. ▪ There is a lack of off-road bypass options on the approaches and departures for cyclists travelling through the Thelma Street and Preston Street intersections. ▪ There is a lack of suitable options to enter/exit the roadway at the locations where the bike lanes discontinue south of Angelo Street. ▪ Cars were observed to park on the bike lanes, particularly south of Saunders Street. ▪ There is a lack of wayfinding along the route.	▪ Upgrade the existing on-road cycle lanes as part of the next resurfacing upgrade on-road cycle lanes between Hensman Street and South Terrace, with red asphalt, and adequate pavement markings and signage. Additionally, investigation into the extension of on-road cycle lanes through each intersection (i.e. advanced cycling stop boxes) along the entire road between Angelo Street and Canning Highway should be undertaken (i.e. Saunders Street, South Terrace). ▪ Investigate the installation of new on-road cycle lanes between Angelo Street and Mends Street, which may require removal of one southbound traffic lane on Labouchere Road. ▪ Consider installing off-road bypass cycle paths prior to each bus stops to allow cyclists to bypass a stopped bus. ▪ Install appropriate off-road bypass paths on the Labouchere Road approaches and departures to the Preston Street roundabout. ▪ Install appropriate off-road bypass paths on the south approach and departure at the Preston Street roundabout. ▪ Remove the existing median island at the Saunders Street intersection and consider raising the intersection to slow vehicles. ▪ Formalise on-street parking south of Saunders Street and include bike symbols in the centre of the lanes to encourage cyclists to use the centre of the lane. ▪ Install wayfinding along the route particularly at Comer Street (overpass), Preston Street, Thelma Street and Cale Street. This should form part an overall wayfinding strategy (as outlined in Section 8.3.1)

Link Reference	Street Name	Between	Description	Photos	Comments / Issues	Suggestions
L12-A	Coode Street	South Perth Foreshore and South Terrace	**Bicycle Lanes (on-road** Approximately 1.5m on-road bike lanes, which discontinue north of Mill Point Road	 	▪ This provides part of a north-south direction connection between Como and the South Perth Foreshore. ▪ This route carries traffic volumes generally below 6,000 vehicles per day and the posted speed is 50km/hr. ▪ This is a high frequency bus route which creates potential conflicts for on-road cyclists at bus stops. ▪ The existing on-road bike lanes discontinue at the Mill Point Road, Angelo Street and South Terrace intersections, and lack suitable options to enter/exit the roadway at these locations. ▪ While the bike lanes do not continue north of Mill Point Road a 2.5m concrete path is located on the west side. ▪ There is a lack of wayfinding along the route.	▪ Upgrade the existing on-road cycle lanes between South Perth Foreshore and South Terrace to protected cycle lanes, as proposed in the Coode Street prioritised project (outlined in Section 8.2). ▪ Investigate extending the on-road cycle lanes through the Mill Point Road, Angelo Street and South Terrace intersections (i.e. advanced cycle stop boxes) as proposed in the Coode Street prioritised project (outlined in Section 8.2). ▪ Upgrade the existing footpath between the South Perth Foreshore and Mill Point Road to a 2.5-3.0m red asphalt shared path with appropriate line marking and signage. Additionally, consider the installation of cycle friendly traffic calming devices to reduce vehicle speed for on-road cyclists. ▪ Install wayfinding along the route particularly at the South Perth Foreshore, Mill Point Road, Angelo Street and South Terrace. This should form part an overall wayfinding strategy (as outlined in Section 8.3.1)
L12-B	Coode Street	South Terrace and Canning Highway	**On-Road (unmarked)** The road currently has no cycling facilities and is generally 9.0 to 10.0m wide	 	▪ This provides part of a north-south direction connection between Como and the South Perth Foreshore. ▪ This route carries traffic volumes generally below 6,000 vehicles per day and the posted speed is 50km/hr. ▪ This is a high frequency bus route which creates potential conflicts for on-road cyclists at bus stops. ▪ No formal cycle lanes provided, with inconsistent pavement markings. ▪ Two roundabouts are located along the route, which create an intimidating environment for cyclists. ▪ There is a lack of wayfinding along the route.	▪ Install on-road bike lanes between South Terrace and Thelma Street as proposed in the Coode Street prioritised project (outlined in Section 8.2). ▪ Install wayfinding along the route particularly at South Terrace, Preston Street and Thelma Street. This should form part an overall wayfinding strategy (as outlined in Section 8.3.1).
L13-A	Kent Street	Manning Road and Hayman Road	**Sealed Shoulder (on-road) and Shared Path (off-road)** Approximately 1.5m on-road bike lanes (sealed shoulder), which discontinues approximately 300m north of the Manning Road intersection. A 2.0 to 3.0m wide concrete path runs along the west side of the road. A 3.0m off-road path and on-road bike lane run lane along the east side which are located within ToVP. Only the western		▪ This provides a key strategic route that connects to Curtin University, Town of Victoria Park and the Douglas Avenue Hayman Road strategic route. ▪ Existing traffic volumes along the road are approximately 22,000 vehicles per day and the speed limit is 70km/hr. ▪ This is a high frequency bus route which creates potential conflicts for on-road cyclists at bus stops ▪ The existing concrete path lacks appropriate markings and signage, and is narrower than a high quality shared path. ▪ The sealed shoulder is surfaced with red pavement but is not appropriately signed or marked, which may cause confusion for cyclists wishing to use the facility.	▪ Formalise and widen the existing on-road cycle lanes and provide off-road bypass paths during the next resurfacing works as proposed in the Kent Street prioritised project (outlined in Section 8.2). ▪ As part of next footpath resurfacing consider upgrading the existing footpath on the west side with a 2.5m-3.0m wide high quality shared path. ▪ Install wayfinding along route particularly at Manning Road, Curtin University Main Street and Hayman Road. This should form part an overall wayfinding strategy (as outlined in Section 8.3.1).

Link Reference	Street Name	Between	Description	Photos	Comments / Issues	Suggestions
			(southbound) carriageway is located within CoSP, which is the only one referred from here.		▪ There is a lack of priority for northbound cyclists turning onto Curtin University Main Street, which puts cyclists in dangerous positions. ▪ Where the northbound bike lane begins, 300m north of Manning Road, there is a lack suitable options to enter the roadway. ▪ There is a lack of wayfinding along the route.	
L13-B	Kent Street	Hayman Road and Jarrah Road	**Sealed Shoulder (on-road)** Approximately 0.8m on-sealed shoulder, which discontinues at some intersections. Only the western carriageway (northbound) is located within CoSP which is only referred to from here.	 	▪ This provides a key strategic route that connects to Curtin University, Town of Victoria Park and the Douglas Avenue Hayman Road strategic route. ▪ Existing traffic volumes along the road are approximately 12,000 vehicles per day and the speed limit is 60km/hr. ▪ This is a high frequency bus route which creates potential conflicts for on-road cyclists at bus stops. ▪ The sealed shoulder is narrow, not surfaced with red asphalt, or marked with bike symbols and signage. ▪ The sealed shoulder discontinues at the Dick Perry Avenue/Turner Avenue and Jarrah Road intersections. There is also no sealed shoulder along the section between Dick Perry Avenue/Turner Avenue and Jarrah Road. ▪ There is currently a lack of off-road bypass paths at the Hayman Road, Dick Perry Avenue/Turner Avenue and Jarrah Road intersections, for the Kent Street approaches and departures. ▪ Median crossings lack holding rails and the required widths for cyclists along Kent Street at the Hayman Road and Jarrah Road intersections. ▪ A 1.8m concrete path is located along a short span (approximately 100m) on the western side south of Jarrah Road. ▪ A short span of shared path is located at the intersection, however the line markings and pavement markings are faded and the surface quality degraded. ▪ Some wayfinding is present, although it shows the outdated Perth Bicycle Network (PBN) routes.	▪ Install new 1.5m on-road cycle lanes with appropriate red asphalt and pavement markings and signage along this section, as proposed in the Kent Street prioritised project (outlined in Section 8.2). ▪ In collaboration with ToVP, install holding rails and shift median crossings so that adequate width is provide (minimum 2.5m) at the Kent Street legs of the Hayman Road intersection. ▪ Install wayfinding along route particularly at Hayman Road, Turner Avenue (Technology Park) and Jarrah Road. This should form part an overall wayfinding strategy (as outlined in Section 8.3.1).

Link Reference	Street Name	Between	Description	Photos	Comments / Issues	Suggestions
L14	Angelo Street	Labouchere Road and Douglas Avenue	**On-Road (unmarked)** The road currently has no cycling facilities and is generally 7.0 to 13.5m wide. This road is labelled on the DoT Cycle Map as a local bicycle friendly route.	 	▪ This provides a local east-west route that connects to Angelo Street shops, Perth Zoo, and Wesley College. ▪ The speed limit is 50km/hr along the majority and 40km/hr at the Angelo Street shops. ▪ A bus service is located along this route. ▪ Formalised parking is located along the section at the Angelo Street shops. ▪ A considerable hill is located west of Forrest Street, increasing effort for cyclists. ▪ There is a lack of wayfinding along the route. ▪ There is a lack of cycling facilities and space along the route, with potential conflicts on and off-road including at the Angelo Street Shops. This is increase with the use of a painted kerbed median along route approximately 1.5m wide.	▪ As part of the next resurfacing, investigate the feasibility of developing the high activity section of Angelo Street into a slow speed shared environment. In addition, the feasibility of installing a bi-directional cycle path on one side or protected on-road cycle lanes for the remaining length of Angelo Street should be investigated. ▪ Install wayfinding along route particularly at Perth Zoo, Angelo Street shops and Lawler Street. This should form part an overall wayfinding strategy (as outlined in Section 8.3.1).
L15-A	South Terrace/ George Street	Kwinana Freeway Off-Ramp/ Melville Parade and Labouchere Road	**Bicycle Lanes (on-road** Approximately 1.5m on-road bike lanes, which discontinue at the intersections. This section is labelled on the DoT Cycle Map as a local bicycle friendly route.	 	▪ This provides an east-west route through CoSP that connects to the Kwinana Freeway, South Perth Hospital, CoSP Library and Council Building, and Kensington Secondary School. ▪ Existing traffic volumes along the road are approximately 5,000 vehicles per day and the speed limit is 60km/hr. ▪ The existing on-road bike lanes are marked with bike symbols, but the south side (westbound) is not surfaced with red asphalt. ▪ There is a lack of suitable options to enter/exit the roadway at the locations where the bike lanes discontinue. ▪ A high number of cars were observed to park on the bike lanes, putting cyclists in dangerous positions. ▪ There is a lack of wayfinding along the route.	▪ At the east side of the section, where the on-road bike lanes discontinue/begin, install off-road bypass paths with smooth transitions. ▪ As part of the next resurfacing, upgrade the existing on-road cycle lanes with red asphalt, and investigate the extension of cycle lanes through the Labouchere Road intersection (i.e. advanced stop cycle boxes). ▪ Install appropriate bicycle lane signage and pavement markings which will allow the enforcement of parking on the lanes.
L15-B	South Terrace/ George Street	Labouchere Road and Canning Highway	**On-Road (unmarked)** The road currently has no cycling facilities and is generally 10.0 to 12.0m wide, with sections of painted median and road narrowing.		▪ This provides an east-west route through CoSP that connects to the Kwinana Freeway, South Perth Hospital, CoSP Library and Council Building, and Kensington Secondary School. ▪ Existing traffic volumes along the road are approximately 13,000 vehicles per day and the speed limit is 60km/hr. ▪ Part of the section is used by a bus service. ▪ A considerable hill is located between Labouchere Road and Coode Street, increasing effort for cyclists. ▪ There is a lack of wayfinding along the route.	▪ As part of the next resurfacing, investigate the provision of protected 1.5m on-road cycle lanes and advanced stop cycle boxes on the South Terrace approaches at both Coode Street and Canning Highway intersections. This will require liaison with Main Roads. ▪ To avoid the steep grade of South Terrace, consider an alternative route to the Kwinana Freeway principal shared path for cyclists along Hazel Street and Comer Street. ▪ Install wayfinding along route particularly at Coode Street and Canning Highway. This should form part an overall wayfinding strategy (as outlined in Section 8.3.1).

Link Reference	Street Name	Between	Description	Photos	Comments / Issues	Suggestions
L15-C	South Terrace/ George Street	Canning Highway and Douglas Avenue/ Hayman Road	**Sealed Shoulder (on-road)** Approximately 1.5m on-road bike lanes (sealed shoulder), which discontinue at some intersections.		▪ This provides an east-west route through CoSP that connects to the Kwinana Freeway, South Perth Hospital, CoSP Library and Council Building, and Kensington Secondary School. ▪ Existing traffic volumes along the road are approximately 12,000 vehicles per day and the speed limit is 60km/hr. ▪ Part of the section is used by a bus service. ▪ Several traffic calming devices are located along the section ▪ On-road bike lanes are not marked with bike symbols and signage along the entire length. ▪ On-road bike lanes lack continuity at the Canning Highway, Murray Street and Hayman Road intersections. ▪ There is currently a lack of off-road bypass paths at the Murray Road/ David Street roundabout. ▪ Cars were observed to park on the bike lanes, putting cyclists in dangerous positions. ▪ There is a lack of wayfinding along the route.	▪ At the roundabout of Murray Street/David Street, cycle pavement symbols are recommended to be installed at the centre of the approach lanes of South Terrace to improve awareness for cyclists. Off-road bypass paths should also be installed at a smooth transition for cyclists, plus the median crossings should be investigated for widening (2.5m minimum width) with holding rails to allow for cyclist storage. ▪ Cycle protection kerbs or an appropriate bypass path should be installed at the traffic calming devices along this route ▪ As part of the next resurfacing works this entire section of on-road cycle lanes is recommended to be reviewed. The cycle lanes should be sealed in red asphalt at a minimum width of 1.5m with consideration of protection. In addition, green asphalt should be used for the cycle lanes across all side intersections. Where possible, the existing traffic lane width should be narrowed to the minimum possible to facilitate a wider cycle lane. ▪ Install wayfinding along route particularly at Murray Street/Bland Street and Hayman Road. This should form part an overall wayfinding strategy (as outlined in Section 8.3.1).
L15-D	South Terrace/ George Street	Douglas Avenue/ Hayman Road and Berwick Street	**Sealed Shoulder (on-road)** Approximately 1.5m on-road bike lanes (sealed shoulder), which discontinue at some intersections.		▪ This provides an east-west route through CoSP that connects to the Kwinana Freeway, South Perth Hospital, CoSP Library and Council Building, and Kensington Secondary School. ▪ Existing traffic volumes along the road are approximately 11,000 vehicles per day and the speed limit is 60km/hr. ▪ On-road bike lanes are not surfaced with red asphalt, or marked with bike symbols and signage. ▪ There is a lack of wayfinding along the route.	▪ As part of the next resurfacing works this entire section of on-road cycle lanes is recommended to be reviewed. The cycle lanes should be sealed in red asphalt at a minimum width of 1.5m with consideration of separation. In addition, green asphalt should be used for the cycle lanes across all side intersections. Where possible, the existing traffic lane width should be narrowed to the minimum possible to facilitate a wider cycle lane. ▪ Investigate the enhancement of the on-road cycle environment at the commercial precinct between Kennard Street and Lansdowne Road. Speed reduction, signage and pavement markings could be implemented to increase cyclist safety and driver awareness. ▪ Install wayfinding along route particularly at Baron-Hay Court, Banksia Terrace and Harold Rossiter Park. This should form part an overall wayfinding strategy (as outlined in Section 8.3.1).
L16-A	Murray Street	Jackson Avenue and Thelma Street	**Shared Path (off-road) and Bicycle Lane (on-road)** Approximately 1.5m on-road bike lane, for one section of the road. A 2.5m wide concrete path runs along the west side of the road		▪ This provides a north-south connection from Henley Street/Jackson Road connection to South Terrace and Douglas Avenue, and provides access to Como Secondary College, Penrhos College and Wesley Playing fields ▪ Existing traffic volumes along the road are generally below 4,000 vehicles per day and the speed limit is 50km/hr.	▪ During the next resurfacing of Murray Street, consider installing a bi-directional cycle path with lighting on the eastern side of Murray Street. ▪ In the short term, install a smooth ramp connection to the existing path at the Murray Street cul-de-sac to increase convenience for cyclists. ▪ Install wayfinding along route particularly at Jackson Road and Thelma Street. This should form part an overall wayfinding strategy (as outlined in Section 8.3.1).

Link Reference	Street Name	Between	Description	Photos	Comments / Issues	Suggestions
					▪ On-road bike lanes are not surfaced with red asphalt, and discontinue for most of the section. ▪ At the south end of the southbound bike lane, the narrowing of the road at the McNabb Loop intersection ('nib') guides cyclists into the way of general traffic, increasing the chances of conflict. ▪ There is a lack of formalised pavement and line marking along the shared path and it lacks adequate width and surface quality at sections. ▪ A high number of cars were observed to park on the bike lanes, putting cyclists in dangerous positions. ▪ There is a lack of lighting at from Murray Street to the Jackson Road/ Henley Street connection. ▪ There is a lack of a direct connection for cyclists for the shared path connection with the Jackson Road/ Henley Street separated path. There is also a lack of a direct connection to the south end of Murray Street. ▪ There is a lack of wayfinding along the route.	
L16-B	Murray Street	Thelma Street and South Terrace	**On-Road (unmarked)** The road currently has no cycling facilities and is generally 10.0m wide. This road is labelled on the DoT Cycle Map as a local bicycle friendly route.		▪ This provides a north-south connection from Henley Street/Jackson Road connection to South Terrace and Douglas Avenue, and provides access to Como Secondary College, Penrhos College and Wesley Playing fields ▪ Existing traffic volumes along the road are generally below 6,000 vehicles per day and the speed limit is 50km/hr. ▪ The road is narrowed by a 1.8m painted median with planted trees, which reduces the space available to cyclists ▪ This road is used by a bus service, which creates potential conflicts for on-road cyclists at bus stops. ▪ There is a hill along the road increasing effort for cyclists. ▪ On-road bike symbols are faded, making it difficult for drivers see. ▪ Three roundabouts are located along the road, which put cyclists in dangerous positions. ▪ There is a lack of wayfinding along the route.	▪ This section of Murray Street is constrained and caters for high traffic volumes and is a bus route. In addition, there are existing trees in the median which provide a squeeze point for cyclists. The potential modification to this section of Murray Street to provide improved cycle infrastructure will likely require the removal of the existing trees or significant cost in widening the road cross section. As such, an alternative route for cyclists is proposed along the parallel Bland Street which can be developed in the future to a Safe Active Street. The existing shared path along the southern side of Thelma Street can be utilised to direct cyclists to Bland Street. Bland Street will also allow cyclists to bypass the conflict points at the Murray Street/South Terrace roundabout which is highly constrained.

Link Reference	Street Name	Between	Description	Photos	Comments / Issues	Suggestions
L16-C	David Street	South Terrace and Douglas Avenue	**On-Road (unmarked)** The road currently has no cycling facilities and is generally 6.0m wide, with two traffic calming devices. This road is labelled on the DoT Cycle Map as a local bicycle friendly route.		▪ This provides a north-south connection from Henley Street/Jackson Road connection to South Terrace and Douglas Avenue, and provides access to Como Secondary College, Penrhos College and Wesley Playing fields ▪ Existing traffic volumes along the road are generally below 1,500 vehicles per day and the speed limit is 50km/hr. ▪ The traffic calming devices guide cyclists into the way of general traffic, increasing chances of conflict. ▪ There is a lack of wayfinding along the route.	▪ Due to the current traffic calming arrangement, which requires one direction of traffic to give way at a time, investigate improvements for cyclists (to avoid putting them in dangerous positions). It is proposed that Bland Street is developed into a cycle route in the future as a more suitable alternative route.
L17	Mill Point Road	Coode Street and Way Road	**Sealed Shoulder (on-road)** Approximately 1.5m on-road bike lanes (sealed shoulder), which discontinue at some intersections.		▪ This provides an east-west connection from Sir James Mitchell Park to Canning Highway. ▪ Existing traffic volumes along the road are approximately 16,000 vehicles per day and the speed limit is 60km/hr. ▪ This road is used by a bus service, which creates potential conflicts for on-road cyclists at bus stops. ▪ The road is narrowed by a 2.5m painted/concrete median. ▪ On-road bike lanes are surfaced with red asphalt along most of the road, but are not marked with bike symbols or signage. A small section between Hovia Terrace and Way Road is not surfaced with red pavement. ▪ On-road bike lanes do not extend the entire length to the Coode Street intersection, and lack suitable options to enter/exit the roadway at these locations. ▪ There is a lack of wayfinding along the route.	▪ As part of the next resurfacing works this entire section of on-road cycle lanes is recommended to be reviewed. The cycle lanes should be sealed in red asphalt at a minimum width of 1.5m and it is recommended that protection is considered. In addition, green asphalt should be used for the cycle lanes across all side intersections. Where possible, the existing traffic lane width should be narrowed to the minimum possible to facilitate a wider cycle lane. ▪ Consider the installation of cycling advanced stop boxes at the Coode Street intersection. ▪ Investigate modification to the intersection of Mill Point Road and Way Road to enhance the connection to Heppingstone Street and provide safe and convenient access to the existing on-road cycle lanes on Mill Point Road. ▪ Consider developing Heppingstone Street and Lamb Street into a Safe Active Street to enhance the cyclist connection between Mill Point Road and the South Perth Foreshore path. ▪ Install wayfinding along route particularly at the intersections of Coode Street, Douglas Avenue, Hurlingham Road and Heppingstone Street. This should form part an overall wayfinding strategy (as outlined in Section 8.3.1).
L18-A	Talbot Avenue/ Barker Avenue	Canning Highway and Henley Street	**Bicycle Lanes (on-road** Approximately 1.5m on-road bike lanes, which discontinue at some intersections. This section is labelled on the DoT Cycle Map as a local bicycle friendly route.		▪ This provides a north south connection from Canning Highway and Manning Road. ▪ This road is used by a bus service, which creates potential conflicts for on-road cyclists at bus stops. ▪ Existing traffic volumes along the road are moderate and the speed limit is 50km/hr. ▪ The existing on-road bike lanes are marked with bike symbols but are not surfaced with red pavement. ▪ The Canning Highway intersection is an important connection point to the Thelma Street strategic route and Labouchere Road strategic route. The existing on-road bike lanes do not extend the entire length to the Canning Highway intersection.	▪ Install off-road bypass paths with smooth transitions at the Saunders Street roundabout and Brittain Street/Park Street roundabout. ▪ As part of the next resurfacing works this entire section of on-road cycle lanes is recommended to be reviewed. The cycle lanes should be sealed in red asphalt at a minimum width of 1.5m with consideration of protection. In addition, green asphalt should be used for the cycle lanes across all side intersections. Where possible, the existing traffic lane width should be narrowed to the minimum possible to facilitate a wider cycle lane. ▪ It is recommended that this area is reviewed to provide consistent cycle facilities through the Canning Highway intersection. This will require liaison with Main Roads. Investigate the feasibility of providing a continuous cycle lane

Link Reference	Street Name	Between	Description	Photos	Comments / Issues	Suggestions
					▪ There is a lack of wayfinding along the route.	(marked in green asphalt) through the intersection of Canning Highway, with an appropriate off-road bypass path to allow cyclists to cross to Thelma Street if desired. Modification to the parking layout at the small commercial lots on the corner may be required and will require further investigation. ▪ Install wayfinding along route particularly at Canning Highway. This should form part an overall wayfinding strategy (as outlined in Section 8.3.1).
L18-B	Talbot Avenue	Henley Street and Bickley Street	**On-Road (unmarked)** The road currently has no cycling facilities and is generally 6.0m wide, with two traffic calming devices. This road is labelled on the DoT Cycle Map as a local bicycle friendly route.		▪ This provides a north south connection from Canning Highway and Manning Road. ▪ Existing traffic volumes along the road are below 1,000 vehicles per day and the speed limit is 50km/hr. ▪ There is a lack of wayfinding along the route.	▪ Improve Henley Street/Talbot Avenue intersection by installing smoother transitions for northbound and southbound cyclists on both sides of Talbot Avenue. It is recommended that the median crossings are widened to 2.5m minimum (3.0m desirable) with holding rails to accommodate crossing cyclists. ▪ Install wayfinding along route particularly at Henley Street and Bickley Crescent. This should form part an overall wayfinding strategy (as outlined in Section 8.3.1).
L18-C	Bickley Crescent	Talbot Avenue and Manning Road	**On-Road (unmarked)** The road currently has no cycling facilities and is generally 6.0m wide, with two traffic calming devices. This road is labelled on the DoT Cycle Map as a local bicycle friendly route.		▪ This provides a north south connection from Canning Highway and Manning Road. ▪ Existing traffic volumes along the road are below 1,000 vehicles per day and the speed limit is 50km/hr. ▪ There is a lack of priority at the Pether Road intersection. ▪ Formalised parking is located at the south end of Bickley Crescent (cul-de-sac), and a path connection to Manning Road. ▪ There is a lack of wayfinding along the route.	▪ Install wayfinding along route particularly at Manning Road. This should form part an overall wayfinding strategy (as outlined in Section 8.3.1).
L19	Dick Perry Avenue	Hayman Road and Kent Street	**Sealed Shoulder (on-road)** Approximately 1.5m on-road bike lanes (sealed shoulder), which discontinue at some intersections. This road is labelled on the DoT Cycle Map as a local bicycle friendly route.	 	▪ This provides an east-west connection from Hayman Road and Kent Street, and provides access to Technology Park. ▪ On-road bike lanes are surfaced with red asphalt along the road, but are not marked edge lines or bike symbols, which may cause confusion for cyclists wishing to use the facility. ▪ There is a lack of appropriate off-road bypass paths at the west leg of the Kent Street intersection. ▪ On-road bike lanes do not extend the entire length to the Burvill Circuit intersection, and lack suitable options to enter/exit the roadway at these locations. There is also a lack of appropriate crossing facilities at Hayman Road. ▪ There is a lack of wayfinding along the route	▪ As part of the next resurfacing works this entire section of on-road cycle lanes is recommended to be reviewed. The cycle lanes should be sealed in red asphalt at a minimum width of 1.5m with consideration of protection. In addition, green asphalt should be used for the cycle lanes across all side intersections. Where possible, the existing traffic lane width should be narrowed to the minimum possible to facilitate a wider cycle lane. ▪ Install appropriate off-road bypass paths at the Burvill Circuit and Kent Street roundabouts. ▪ Install wayfinding along route particularly at Hayman Road and Kent Street. This should form part an overall wayfinding strategy (as outlined in Section 8.3.1).

Link Reference	Street Name	Between	Description	Photos	Comments / Issues	Suggestions
L20-A	Cale Street	Kwinana Freeway Overpass and Park Street	**Sealed Shoulder (on-road) and unmarked (on-road)** Approximately 1.5m on-road bike lanes (sealed shoulder) along most of the road, which discontinue between Robert Street and Canning Highway. This road is labelled on the DoT Cycle Map as a local bicycle friendly route.	 	▪ This provides an east-west connection between Kwinana Freeway and Como Secondary College. ▪ Existing traffic volumes along the road are below 1,000 vehicles per day and the speed limit is 50km/hr. ▪ On-road bike lanes are not surfaced with red asphalt or marked with bike symbols and signage. ▪ Bike symbols are used on the connection to the Kwinana Freeway overpass, however these are faded. ▪ The existing crossing at Canning Highway lacks adequate width for cyclists, putting cyclists in dangerous positions. ▪ There is a lack of appropriate off-road bypass paths at the Cale Street legs of the Robert Street Roundabout. ▪ There is a lack of wayfinding along the route	▪ Consider developing Cale Street into a Safe Active Street in the future, to enhance the cyclist connection between Como Secondary School and the Kwinana Freeway principal shared path. ▪ Investigate the widening of the median to a minimum 2.5m width (3.0m desirable) on Canning Highway to facilitate cyclists, in liaison with Main Roads WA. ▪ Install wayfinding along route particularly at the Kwinana Freeway Overpass and Canning Highway. This should form part an overall wayfinding strategy (as outlined in Section 8.3.1).
L20-B	Cale Street	Canning Highway and Bruce Street	**Unmarked (on-road)** The road currently has no cycling facilities and is generally 6.0m wide. This road is labelled on the DoT Cycle Map as a local bicycle friendly route.		▪ This provides an east-west connection between Kwinana Freeway and Como Secondary College. ▪ There is a lack of priority at the Baldwin Street and Talbot Avenue intersections.	▪ Consider developing Cale Street into a Safe Active Street in the future, to enhance the cyclist connection between Como Secondary School and the Kwinana Freeway principal shared path.

Link				Convenience			Accessibility / Safety				Comfort				Attractiveness					
Number	Name	Description	Location (between)	Continuity	Legibility	Directness	Worst Junction Conflict Point	Traffic Volume	Traffic Proximity / Mix	Traffic Speed	Link Conflict Points	Effective Width	Surface Quality	Maintenance	Overall Effort	Personal Security	Lighting	Quality of Environment		Overall Score
L1	Kwinana Freeway PSP	Shared Path	Canning Bridge and Narrows Bridge	2	0	2	0	3	3	N/A	1	3	0	0	2	0	-2	1		15
L2	South Perth Foreshore Path	Shared Path/Separated Path	Kwinana Freeway PSP and Ellam Street	2	1	2	0	3	3	3	2	2	1	1	2	2	2	2		28
L3	Hurlingham Road	Shared Path/On-road	South Perth Foreshore and Mill Point Road	2	0	1	0	3	2	0	1	1	0	1	2	2	2	2		19
L4	Banskia Terrace	Shared Path/On-Road	Mill Point Road and George Street	2	1	2	1	2	-2	0	0	0	0	1	0	0	1	1		9
L5	Thelma Street	Shared Path/On-Road	Murray Street and Labouchere Street	-1	0	2	-1	0	0	0	-1	1	0	0	-1	1	1	1		2
L6	Welwyn Avenue	Bicycle Lane	Manning Road and Hope Avenue	1	1	2	-2	0	-1	0	2	0	2	0	2	1	1	1		10
L7	Manning Road	Shared Path	Ley Street and Centenary Avenue	1	0	2	-1	-3	3	3	0	0	-2	0	2	1	1	1		8
L8	Davilak Street/Godwin Avenue/Jackson Avenue	On-Road/Off-road	Canning Bridge and Kent Street	-1	0	1	-2	2	-1	0	0	-1	1	1	2	0	0	0		2
L9	Lawler Street	On-Road	Canning Highway and Mill Point Road	2	-1	1	0	2	2	0	1	-1	1	-1	2	2	0	2		12
L10	Douglas Avenue/ Hayman Road	Shared Path/ Sealed Shoulder	South Perth Foreshore and Kent Street	0	1	2	-3	-3	2	-3	0	0	1	1	1	1	1	1		2
L11	Labouchere Road	Bicycle Lane	Mill Point Road and Canning Highway	1	1	2	-2	-3	2	-3	0	1	1	0	2	2	1	1		6
L12	Coode Street	Bicycle Lane/ On-Road	South Perth Foreshore and Canning Highway	0	1	2	-2	0	-3	0	-1	-1	1	0	2	2	1	1		3
L13	Kent Street	Bicycle Lane	Manning Road and Jarrah Road	0	1	2	-3	-3	2	-3	0	0	1	2	2	1	1	1		4
L14	Angelo Street	On-Road	Labouchere Road and Douglas Avenue	0	0	2	-1		-2	0	0	-1	1	0	-2	1	1	2		1
L15	South Terrace/ George Street	On-Road	Melville Parade and Berwick Street	0	0	2	-2	-2	-2	-3	-1	-1	1	1	0	1	1	1		-4
L16	Murray Street/David Street	On-Road	Jackson Road and Douglas Avenue	0	0	1	-2	0	-2	0	0	-1	1	-1	-1	1	0	1		-3
L17	Mill Point Road	Bicycle Lane	Coode Street and Way Road	1	0	2	1	-3	-2	-3	0	0	2	1	2	1	2	2		6
L18	Talbot Avenue/ Barker Avenue/ Bickley Crescent	Bicycle Lane/On-Road	Canning Highway and Manning Road	1	1	0	-2		0	0	0	-1	0	1	2	1	0	1		4
L19	Dick Perry Avenue	Bicycle Lane	Hayman Road and Kent Street	1	0	1	-2		2	0	2	0	1	0	2	-1	1	1		8
L20	Cale Street	Bicycle Lane/On-Road	Kwinana Freeway Overpass and Bruce Street	1	0	2	-2	2	0	0	1	-1	1	-1	0	1	1	2		7

Modify intersection to improve cyclist priority

Widen and upgrade the existing off-road shared path and install on-road cycle lanes
An alternative option is consider developing into a safe active street.

Support a shared space concept for the Mend Street precinct.

Improve cyclist priority at road junctions

Develop safe active street

Enhance cycle connection

Upgrade intersection with advanced stop boxes

Develop safe active street

Investigate improvements to lighting, signage, pavement surface and general amenity of existing underpass.
Investigate improving cyclist transition into the underpass.

Install 1.5m on-road bike lanes

Investigate the reallocation of a traffic lane for the provision of 1.5m on-road bike lanes

Upgrade to protected on-road cycle lanes (during next resurfacing)

Install bi-directional cycle path

Install bi-directional cycle path

Develop safe active street

Investigate improvement to north-south connection with Main Roads, including continuation of lanes through intersection

Develop safe active street

Consider a shared space for the high activity Angelo Street precinct

Upgrade to protected on-road cycle lanes with bus stop bypasses (during next resurfacing)
Install new shared path on western side of Labouchere Road.

Install appropriate bypass paths

Upgrade to protected on-road cycle lanes

Upgrade to protected on-road cycle lanes(during next resurfacing)

Install advanced stop boxes

Upgrade intersection with advanced stop boxes

Install protected bicycle lanes

Upgrade intersection with advanced stop boxes

As an alternative to installing on-road lanes on South Terrace between Labouchere Road and Coode Street, strengthen the Comer Street connection to South Terrace and also the Community Centre. A safe active street treatment for this section could be developed.

Install on-road cycle lanes

Upgrade to protected on-road cycle lanes

In collaboration with ToVP install Off-Road Bypasses, and widen median crossings

Install appropriate off-road bypass paths

Develop safe active street

Upgrade to protected on-road cycle lanes

Install protected on-road cycle lanes and upgrade the existing path to a 3.0m high quality shared path in collaboration with ToVP

Upgrade to protected on-road cycle lanes(during next resurfacing)

Upgrade to 2.5m-3.0m red asphalt shared path

Develop safe active street

Develop safe active street

Install off-road bypass

Provide appropriate off-road bypasses, Widen median crossings

Provide appropriate off-road bypasses, Shift E-W median crossing on southern leg north

Upgrade intersection with improved cycle facilities

Investigate modification to intersection

Remove pedestrian only signs and install shared path signage

Modify intersection to remove pinch point

Upgrade to protected on-road cycle lanes

Install bi-directional cycle path with appropriate tie-in to Godwin Avenue path

Provide appropriate off-road bypass path to facilitate access to new main street

Install appropriate bypass paths

Install bi-directional cycle path

Install new cut-through crossing

Develop safe active street

Upgrade to 2.5m-3.0m shared path

Develop safe active street

Reduce posted speed to 60km/h

Investigate median widening on Canning Highway

New kids skills and pump track with upgraded shared path connections

Investigate the reduction of posted speed to 60km/h.
Upgrade to protected on-road cycle lanes (during next resurfacing) in collaboration with ToVP.
Install off-road bypass paths at bus stops.

Develop safe active street

Install pedestrian/cyclist crossings on east-west legs

Install bi-directional cycle path

Install pedestrian/cyclist crossing on eastern leg at signals (N-S direction)

Investigate flooding issues along the PSP (similar treatment to the Causeway in ToVP could be implemented).
Cyclists are required to cross Canning Highway at four signalised crossings to access Canning Station with high delays. Improved priority for cyclists connecting to Canning Station should be investigated.
The above should be considered in any future works planned in this area by the Transport Portfolio

Install advanced stop box on Welwyn Avenue approach and install staggered pedestrian/cycle crossing on eastern leg (N-S direction)

Install new 3.0m shared path

Install protected on-road lanes or bi-directional cycle lanes

Install pedestrian/cyclist crossings on all legs at signals

Off-Road Bypasses

Upgrade to 2.5m-3.0m red ashpalt shared path

Paint concrete red and reinstall shared path pavement marking

Under Main Roads control.
Lobby to Main Roads to resurface path with high quality red asphalt and install lighting. It is recommended that widening of the path or providing separation for cyclists/pedestrians is also considered.

OR

Install shared path linemarking and signage

Option 1 - Shared path and safe active street along Hope Avenue
Option 2 - Shared path along Roebuck Drive and safe active street down Letchworth Centre Avenue

Investigate the feasibility of installing a shared path from Centenary Avenue to the existing shared path between Clontarf Aboriginal College and Centenary Avenue

Install bi-directional cycle lanes along Mount Henry Road

Legend

- Rail Stop
- Railway
- LGA Boundary (CoSP)
- Hospital Facility
- Separated Path (Bikes Only)
- High Quality Shared Path (Bikes and Pedestrians)
- On-Road Bicycle Lanes or Sealed Shoulders
- Safe Active Street/Shared Space
- Identified issue requiring further investigation
- Identified issue requiring minor works

A1 scale: 1:12,000
0 280 560 m

Source: © Landgate 2017, OSM

Date: 9/08/2017

PERTH

aurecon

DRAFT

Coordinate System: GDA 1994 MGA Zone 50
File: f0002_255909_A1P_Overview_DraftCoSP_RevB
GIS Analyst: Sophie.Richards

Infrastructure Audit Summary (CoSP)

Appendix C – Infrastructure Project Sheets (CoSP)

1 South Perth Esplanade

Objective	Sub Objective	Qualitative Impacts	Quantitative Assessment		Weighting	Weighted /10
			No. of Comments	Score / 10		
Public Consultation	Community Survey	From the community survey, this route received the highest number of comments with regards to cycling issues and safety concerns. The lack of dedicated cycle infrastructure, lack of driver awareness and high pedestrian volumes creates an intimidating environment for cyclists.	26-50	**8.0**	**20%**	**8.50**
	Stakeholders	Discussions were raised regarding the lack of on-road cycle infrastructure along the route, and issues for providing this whilst creating a low speed environment in the vicinity of Mends Street. The appropriate type of cross section along this route was discussed and is being considered as part of future planning within the area (i.e. Connect South).				
			Score / 10	**Average / 10**		
Strategic	Completion of State Networks	This project forms part of the principal route along the Swan River that acts a key connection for the region.	10	**10.0**	**25%**	
Connectivity	Schools	This project provides a connection to Wesley College, St Columba's Catholic Primary School and South Perth Primary School.	6	**6.4**	**25%**	
	Tertiary	This project may increase cyclist connectivity, but connectivity to specific tertiary institutions will be limited.	2			
	Recreational and Tourism	This project is a major recreational route and provides direct access to a number of destinations including Perth Zoo and Mends Street.	10			
	Employment Zones	This project provides direct and convenient access to the Perth CBD and will assist commuters.	10			
	Public Transport	This project will have some benefit in terms of connecting to public transport, as it improves the connection to Mends Street Jetty and the corresponding ferry service.	4			
Economic	Mode Shift	It is very likely that this project could attract non-confident cyclists to visit Perth and the South Perth Foreshore.	10	**6.0**	**5%**	
	Impact on motor vehicles	No impact to vehicles is likely to occur due to this project.	0			
	Economic Impacts	This project is part of the South Perth Foreshore, and connects to Perth Zoo and the Mends Street commercial precinct.	8			
Safety	Cycling Safety	Providing appropriate facilities segregated from general traffic presents significant increases in safety for regular users.	10	**10.0**	**15%**	
	Pedestrian safety issues	The issues associated with conflict between pedestrians and cyclists will not increase because this project does not require the removal of the existing footpath on the north side.	10			
People and Communities	Level of Service	This project will reduce delay across the route, caused by vehicle interactions.	10	**10.0**	**10%**	
	Townscape/Urban Planning	This project aligns with planning to increase activity at the South Perth Foreshore.	10			
Financial	Possible funding source	CoSP Capital Works Programme / Department of Transport				
			Amount			
	Estimated Capital Cost	Estimated cost to install raised pavement crossings with path continued through intersections at three locations, as well as construction of on-road cycle lanes and new shared path along South Perth Esplanade.	$1,500,000.00			

* The number of stakeholder comments is included in the quantitative analysis for assessing the proposed projects. Note that the comments relate to a range of issues and are used to provide an indication of the level of stakeholder interest for the location in question.

2 Canning Bridge to Curtin Link

Objective	Sub Objective	Qualitative Impacts	Quantitative Assessment		Weighting	Weighted /10
			No. of Comments	Score / 10		
Public Consultation	Community Survey	A number of issues were raised for the route, primarily associated with the existing connection between Henley Street and Jackson Road.	6-15	4.0	20%	7.97
	Stakeholders	Curtin University raised the lack of cycle infrastructure connecting to Canning Bridge, and the need for this.				
			Score / 10	Average / 10		
Strategic	Completion of State Networks	This project forms a strategic route acting as a key east-west connection between Curtin University and Canning Bridge.	8	8.0	25%	
Connectivity	Schools	This project provides direct access to Como Secondary School and Curtin Primary School.	10	9.8	25%	
	Tertiary	This project provides direct access to Curtin University.	10			
	Recreational and Tourism	This project connects to a number of key destinations including Curtin University facilities and McDougall Park.	9			
	Employment Zones	This project will provide improved access for commuters accessing Curtin University and residents using Canning Bridge Station to access the Perth CBD.	10			
	Public Transport	This project provides direct access to Canning Bridge Station.	10			
Economic	Mode Shift	It is likely that this project could attract all cyclist groups to access Perth and key destinations within CoSP (i.e. Curtin University).	10	4.3	5%	
	Impact on motor vehicles	The project would decrease the posted speed and remove priority from vehicles between Ley Street and Henley Street, increasing journey times.	-1			
	Economic Impacts	This project will not provide direct access to any shopping centres, but will have some positive effects to Curtin University stores.	4			
Safety	Cycling Safety	Providing appropriate facilities segregated from general traffic presents significant increases in safety for regular users. Removing pinch points, increasing driver awareness and reducing traffic speeds will significantly improve cyclist safety along the safe active street/bicycle boulevard section.	10	10.0	15%	
	Pedestrian safety issues	Existing footpaths remain providing segregation from all other modes.	10			
People and Communities	Level of Service	This project will reduce delay across the route, caused by vehicle interactions.	10	10.0	10%	
	Townscape/Urban Planning	This project aligns with planning to increase activity at the Bentley-Curtin specialised activity centre.	10			
Financial	Possible funding source	CoSP Capital Works Programme / Department of Transport				
			Amount			
	Estimated Capital Cost	Estimated cost over three stages of works to install new bi-directional cycle paths and improved connections at Godwin Avenue/Henley Street and Kent Street intersections. The estimated cost for the Safe Active Street is based on recently completed projects.	$1,800,000.00			

* The number of stakeholder comments is included in the quantitative analysis for assessing the proposed projects. Note that the comments relate to a range of issues and are used to provide an indication of the level of stakeholder interest for the location in question.

3 Manning Road Project

Objective	Sub Objective	Qualitative Impacts	Quantitative Assessment		Weighting	Weighted /10
			No. of Comments	Score / 10		
Public Consultation	Community Survey	There is a high demand for provisions of dedicated cycle infrastructure along this route. A high number of issues and safety concerns were raised along the route including high traffic speeds, high traffic volumes and lack of facilities for cyclists.	26-50	8.0	20%	7.83
	Stakeholders	The lack of on-road cycle infrastructure along the road was discussed, and the need for crossing into the campus.				
			Score / 10	Average / 10		
Strategic	Completion of State Networks	This project forms a strategic route acting as a key east-west connection through to Curtin University and neighbouring Councils.	8	8.0	25%	
Connectivity	Schools	This project provides part of the connection to Manning Primary and Curtin Primary schools and provides direct access to Clontarf Aboriginal College.	10	7.6	25%	
	Tertiary	This project provides direct access with Curtin University.	10			
	Recreational and Tourism	This project acts as an alternative recreational route to the Swan River Foreshore and provides direct access to George Burnett Park, Trinity Playing Fields and Curtin University facilities.	5			
	Employment Zones	This project will provide improved access for commuters accessing Curtin University and residents using Canning Bridge Station to access the Perth CBD.	8			
	Public Transport	This project provides a connection to Canning Bridge Station.	5			
Economic	Mode Shift	It is likely that this project could attract all cyclist groups to access Perth and key destinations within CoSP (i.e. Curtin University).	10	6.7	5%	
	Impact on motor vehicles	Because of the separation to vehicles, this will not effect general traffic.	0			
	Economic Impacts	This project provides direct access to Waterford Plaza shopping centre.	10			
Safety	Cycling Safety	Providing appropriate facilities segregated from general traffic presents significant increases in safety for regular users.	10	8.0	15%	
	Pedestrian safety issues	Shared paths provide a higher probability of conflict between pedestrians and cyclists compared to other facilities.	6			
People and Communities	Level of Service	This project will improve comfort (smoother surface) and reduce delay at cross roads because of improved crossing facilities.	8	8.0	10%	
	Townscape/Urban Planning	This project aligns with planning to increase activity at the Bentley-Curtin specialised activity centre.	8			
Financial	Possible funding source	CoSP Capital Works Programme / Department of Transport / Lotterywest				
			Amount			
	Estimated Capital Cost	Estimated cost to install new shared path along section and upgrade remaining path. Improvements at intersection including advanced cycle stop boxes and crossing facilities is also included.	$600,000.00			

* The number of stakeholder comments is included in the quantitative analysis for assessing the proposed projects. Note that the comments relate to a range of issues and are used to provide an indication of the level of stakeholder interest for the location in question.

4 Douglas Avenue Project

Objective	Sub Objective	Qualitative Impacts	Quantitative Assessment		Weighting	Weighted /10
			No. of Comments	Score / 10		
Public Consultation	Community Survey	A number of issues were raised for crossing at Canning Highway and Mill Point Road, and the lack of cycle facilities along Douglas Avenue between these intersections.	26-50	**8.0**	**20%**	**7.47**
	Stakeholders	Crossing at Canning Highway and Mill Point Road was raised by stakeholders as a significant inconvenience for cyclists.				
			Score / 10	**Average / 10**		
Strategic	Completion of State Networks	This project forms a strategic route acting as a key north-south connection through to Curtin University and the South Perth Foreshore.	8	**8.0**	**25%**	
Connectivity	Schools	This project provides a connection to Wesley College and Kensington Secondary School.	6	**7.2**	**25%**	
	Tertiary	This project provides direct connection with Curtin University.	10			
	Recreational and Tourism	This project connects to a number of key destinations within CoSP including Curtin University facilities and the South Perth Foreshore.	8			
	Employment Zones	This project provides improved connection for non-confident commuters to Curtin University and the Perth CBD.	8			
	Public Transport	This project does not provide access to the rail lines, however it does connect to the South Perth Ferry and various bus stops.	4			
Economic	Mode Shift	It is likely that this project could attract non-confident cyclists to Curtin University, South Perth Foreshore and the Perth CBD.	8	**3.3**	**5%**	
	Impact on motor vehicles	The project would decrease the posted speed and remove priority from vehicles increasing journey times on Douglas Avenue between South Perth Foreshore and Mill Point Road, and along Lawler Street.	-2			
	Economic Impacts	This project will not provide direct access to any shopping centres, but may have some positive effects to Curtin University stores and the Mends Street commercial precinct	4			
Safety	Cycling Safety	Providing appropriate facilities segregated from general traffic presents significant increases in safety for regular users. Removing pinch points, increasing driver awareness and reducing traffic speeds will significantly improve cyclist safety along the safe active street/bicycle boulevard sections.	8	**8.0**	**15%**	
	Pedestrian safety issues	Shared paths provide a higher probability of conflict between pedestrians and cyclists compared to other facilities. For the majority of the project, existing footpaths remain providing segregation from all other modes.	8			
People and Communities	Level of Service	This project will reduce delay across the route, caused by vehicle interactions.	8	**7.0**	**10%**	
	Townscape/Urban Planning	This project aligns with planning to increase activity at the South Perth Foreshore and the Bentley-Curtin specialised activity centre.	6			
Financial	Possible funding source	CoSP Capital Works Programme / Department of Transport				
			Amount			
	Estimated Capital Cost	Estimated cost over four stages of works to install new protected cycle lanes and bi-directional path and an upgraded shared path. Improvements at major intersection including advanced cycle stop boxes and crossing facilities are also included. The estimated cost for the Safe Active Street is based on recently completed projects.	$1,500,000.00			

* The number of stakeholder comments is included in the quantitative analysis for assessing the proposed projects. Note that the comments relate to a range of issues and are used to provide an indication of the level of stakeholder interest for the location in question.

5 Thelma Street Investigation

Objective	Sub Objective	Qualitative Impacts	Quantitative Assessment		Weighting	Weighted /10
			No. of Comments	Score / 10		
Public Consultation	Community Survey	A number of issues were raised, particularly in the vicinity of Penrhos College and to the east, concerned with conflicts with general traffic.	6-15	4.0	20%	6.80
	Stakeholders	Concerns associated with the existing cyclist connection adjacent to Penrhos College were raised.				
			Score / 10	Average / 10		
Strategic	Completion of State Networks	This project forms a strategic route acting as a key east-west connection through to Kwinana Freeway and ToVP.	8	8.0	25%	
Connectivity	Schools	This project provides direct access to Penrhos College and Como Primary School.	10	7.2	25%	
	Tertiary	This project provides connection with Curtin University.	10			
	Recreational and Tourism	This project will improve connectivity to Curtin University facilities, and the Kwinana Freeway PSP.	4			
	Employment Zones	This project will provide improved access for commuters accessing Curtin University and using Kwinana Freeway PSP to access the Perth CBD.	8			
	Public Transport	This project does not provide access to the rail lines, however it does connect to various bus stops.	4			
Economic	Mode Shift	It is likely that this project could attract non-confident cyclists to Curtin University and the Perth CBD.	8	4.0	5%	
	Impact on motor vehicles	The project could potentially decrease the posted speed and remove priority from vehicles, increasing journey times.	-2			
	Economic Impacts	This project will not provide direct access to any shopping centres, but will have some positive effects to Curtin University stores.	6			
Safety	Cycling Safety	Providing appropriate facilities segregated from general traffic presents significant increases in safety for regular users.	10	8.0	15%	
	Pedestrian safety issues	Updating the path adjacent to Wesley Playing Fields to a shared path results in a higher probability of conflict between pedestrians and cyclists compared to other facilities.	6			
People and Communities	Level of Service	This project will reduce delay across the route, caused by vehicle interactions.	8	8.0	10%	
	Townscape/Urban Planning	This project aligns with planning to increase activity at the Bentley-Curtin specialised activity centre.	8			
Financial	Possible funding source	CoSP Capital Works Programme / Department of Transport				
			Amount			
	Estimated Capital Cost	Estimated cost includes an investigation into an improved cycle infrastructure arrangement for east-west cyclists at Penrhos College.	$30,000.00			

* The number of stakeholder comments is included in the quantitative analysis for assessing the proposed projects. Note that the comments relate to a range of issues and are used to provide an indication of the level of stakeholder interest for the location in question.

6 Kent Street Project

Objective	Sub Objective	Qualitative Impacts	Quantitative Assessment		Weighting	Weighted /10
			No. of Comments	Score / 10		
Public Consultation	Community Survey	A number of issues were raised at the Hayman Road intersection, and the facilities north of this.	6-15	**4.0**	**20%**	**6.74**
	Stakeholders	Existing issues associated with high traffic speeds and access points into Curtin University were raised.				
			Score / 10	**Average / 10**		
Strategic	Completion of State Networks	This project forms a strategic route acting as a key north-south connection between CoSP and ToVP and to Curtin University.	8	**8.0**	**25%**	
Connectivity	Schools	Although in ToVP, connection is provided to Kent Street Senior High School.	8	**7.4**	**25%**	
	Tertiary	This project provides direct access to Curtin University.	10			
	Recreational and Tourism	This project connects to a number of key destinations in the area including Curtin University facilities, and the Albany Highway commercial precinct.	6			
	Employment Zones	This project provides improved connections to Curtin University and the Albany Highway commercial precinct.	8			
	Public Transport	This project will have some benefit in terms of connecting to public transport, as it improves the connection to the Rutland Avenue PSP and Victoria Park Station (ToVP).	5			
Economic	Mode Shift	It is likely that this project could attract both non-confident and confident cyclists to Curtin University, and to attractors in ToVP (i.e. Albany Highway commercial precinct).	8	**5.3**	**5%**	
	Impact on motor vehicles	Reduction of the speed limit between Manning Road and Jarrah Road and advanced cyclist stop boxes at signalised intersections will increase journey times for general traffic. A reduction in lane width and traffic calming measures may also reduce the level of service of motor vehicles.	-2			
	Economic Impacts	This project provides direct access to Waterford Plaza shopping centre and the Albany Highway commercial precinct.	10			
Safety	Cycling Safety	Providing appropriate off-road facilities segregated from general traffic presents significant increases in safety for regular users. Off-road bypasses for on-road facilities and painted buffer zones will significantly increase safety for on-road cyclists.	10	**7.5**	**15%**	
	Pedestrian safety issues	Shared paths provide a higher probability of conflict between pedestrians and cyclists compared to other facilities.	5			
People and Communities	Level of Service	This project will improve comfort (smoother surface) and reduce delays at busy sections.	8	**7.0**	**10%**	
	Townscape/Urban Planning	This project aligns with planning to increase activity at the Bentley-Curtin specialised activity centre.	6			
Financial	Possible funding source	CoSP Capital Works Programme / Department of Transport / Curtin University				
			Amount			
	Estimated Capital Cost	Estimated cost includes to install off-road bypass paths, amended median crossings and new protected on-road cycle lane.	$400,000.00			

* The number of stakeholder comments is included in the quantitative analysis for assessing the proposed projects. Note that the comments relate to a range of issues and are used to provide an indication of the level of stakeholder interest for the location in question.

7 Coode Street Project

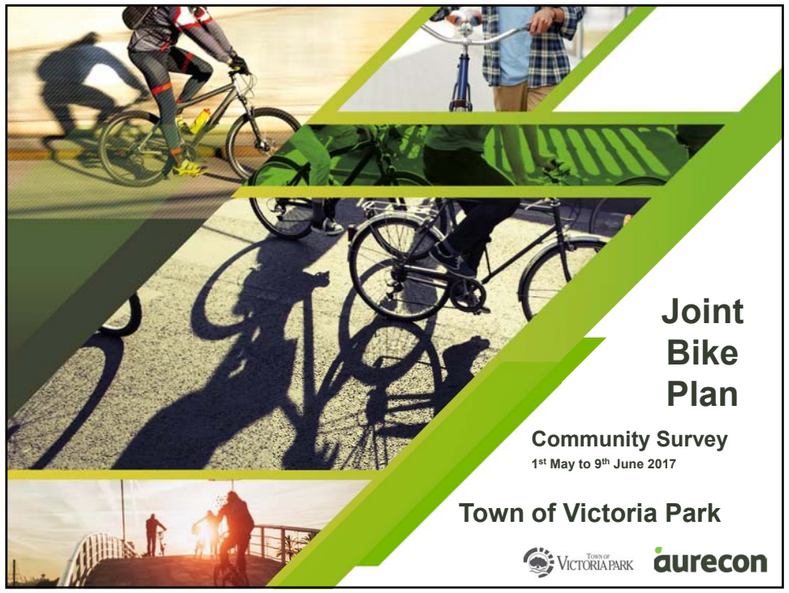
Objective	Sub Objective	Qualitative Impacts	Quantitative Assessment		Weighting	Weighted /10
			No. of Comments	Score / 10		
Public Consultation	Community Survey	A number of issues were raised along the road, particularly concerned with gaps in bike lanes and conflicts with general traffic.	6-15	4.0	20%	6.65
	Stakeholders	Coode Street was identified as an important cycling route within the CoSP.				
			Score / 10	Average / 10		
Strategic	Completion of State Networks	This project forms a strategic route acting as a key north-south connection between South Perth Foreshore and Thelma Street.	8	8.0	25%	
Connectivity	Schools	This project provides direct access to Wesley College and Como Primary School.	10	6.0	25%	
	Tertiary	This project may increase cyclist connectivity, but connectivity to specific tertiary institutions will be limited.	4			
	Recreational and Tourism	This project connects to a number of key destinations within CoSP including Angelo Street and Preston Street commercial precincts and the South Perth Foreshore.	6			
	Employment Zones	This project provides improved access for commuters accessing the Perth CBD.	6			
	Public Transport	This project does not provide access to the rail lines, however it does connect to various bus stops and South Perth Ferry.	4			
Economic	Mode Shift	There is some potential that this project could attract cyclists to access Angelo Street and Preston Street commercial precincts and the South Perth Foreshore.	6	4.0	5%	
	Impact on motor vehicles	This project may involve a reduction in lane width and traffic calming measures that may reduce the level of service of motor vehicles.	-2			
	Economic Impacts	This project provides a connection to the Preston Street commercial precinct and direct access to the Angelo Street commercial precinct.	8			
Safety	Cycling Safety	Off-road bypasses for on-road facilities and painted buffers will significantly increase safety for on-road cyclists.	10	9.0	15%	
	Pedestrian safety issues	Existing footpaths remain providing segregation from all other modes.	8			
People and Communities	Level of Service	This project will improve comfort (smoother surface) and reduce delay at intersections.	8	8.0	10%	
	Townscape/Urban Planning	This project aligns with planning to increase activity at the South Perth Foreshore.	8			
Financial	Possible funding source	CoSP Capital Works Programme / Department of Transport				
			Amount			
	Estimated Capital Cost	Estimated cost includes the installation of new protected on-road cycle lanes plus off-road bypass paths at two intersections and advanced cycle stop boxes at one intersection.	$500,000.00			

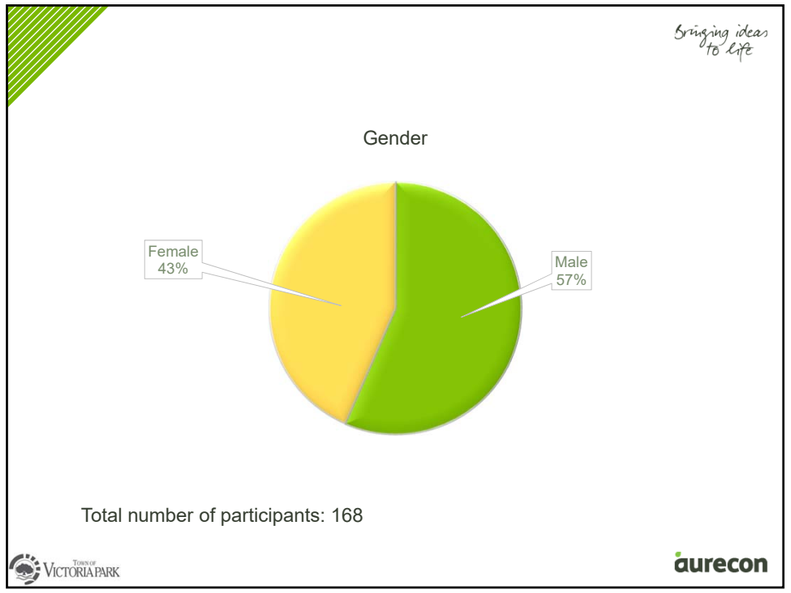
* The number of stakeholder comments is included in the quantitative analysis for assessing the proposed projects. Note that the comments relate to a range of issues and are used to provide an indication of the level of stakeholder interest for the location in question.

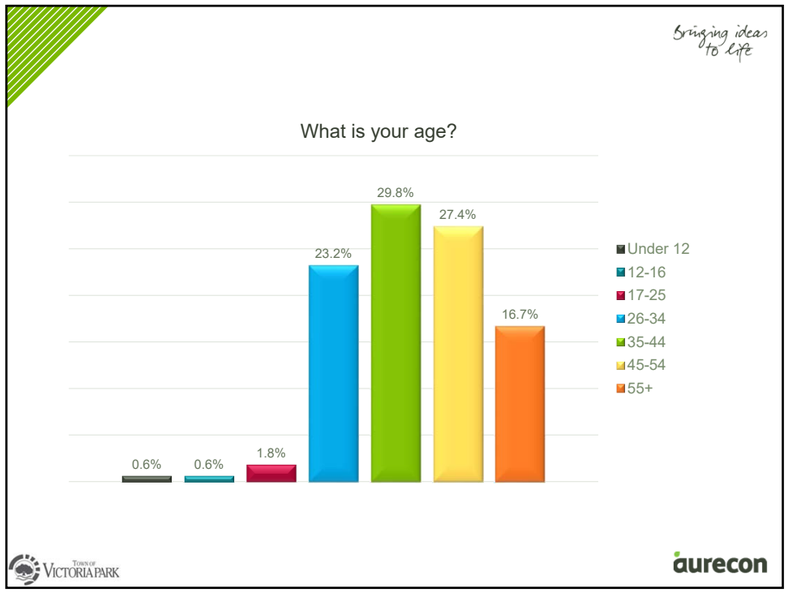
TOWN OF
VICTORIA PARK

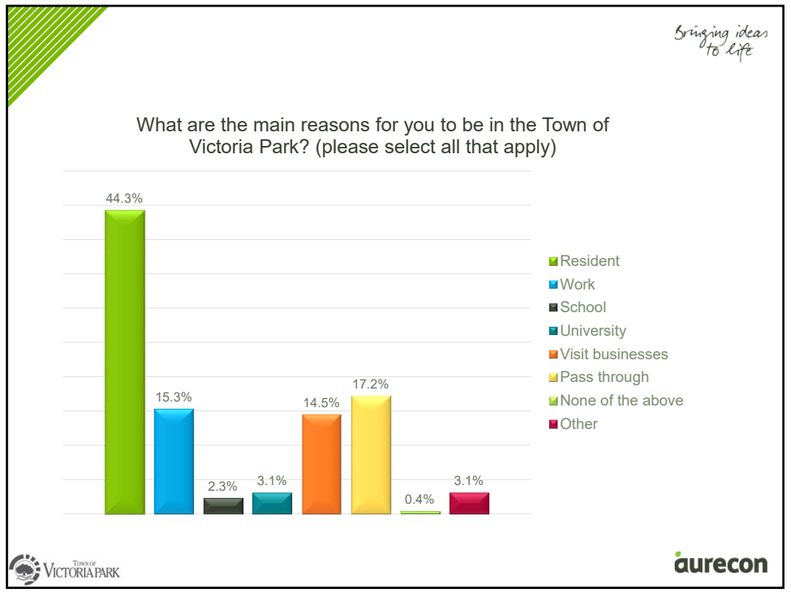
Appendix D – Community Consultation Summary (ToVP)

Appendix D
Community Survey – ToVP Summary

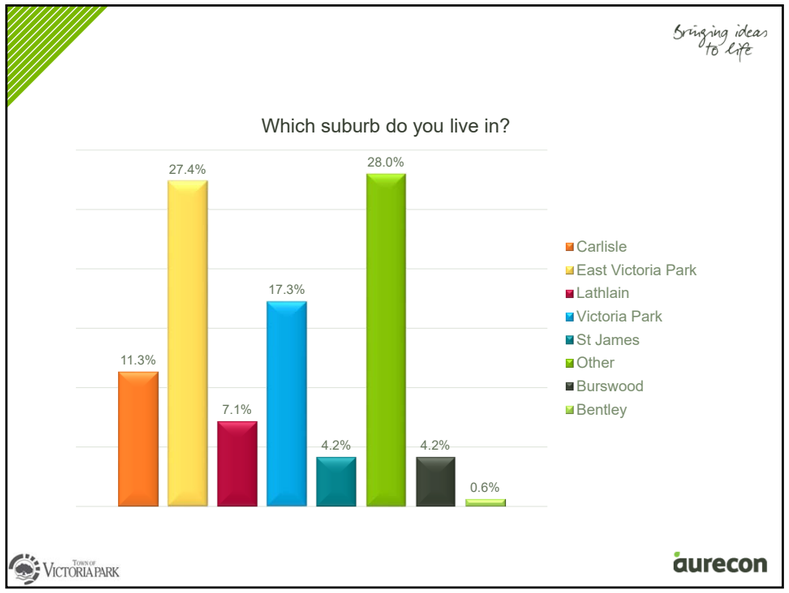


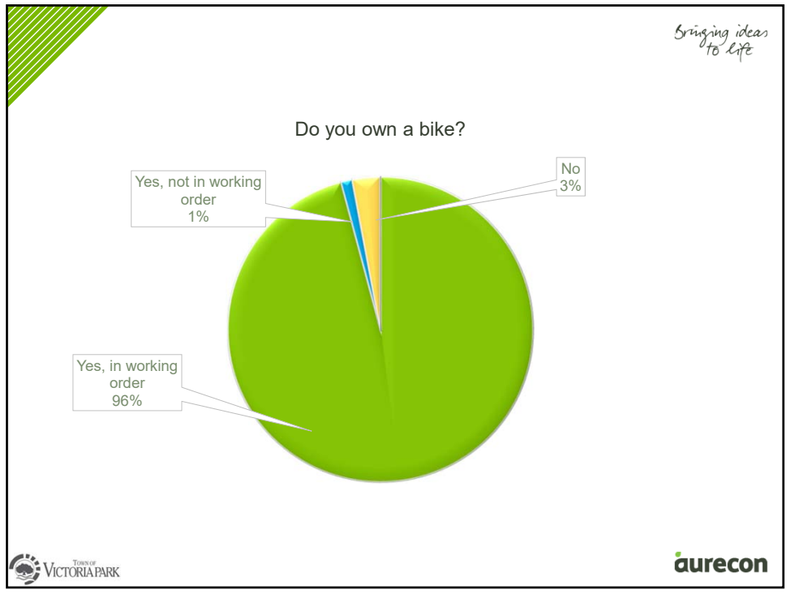


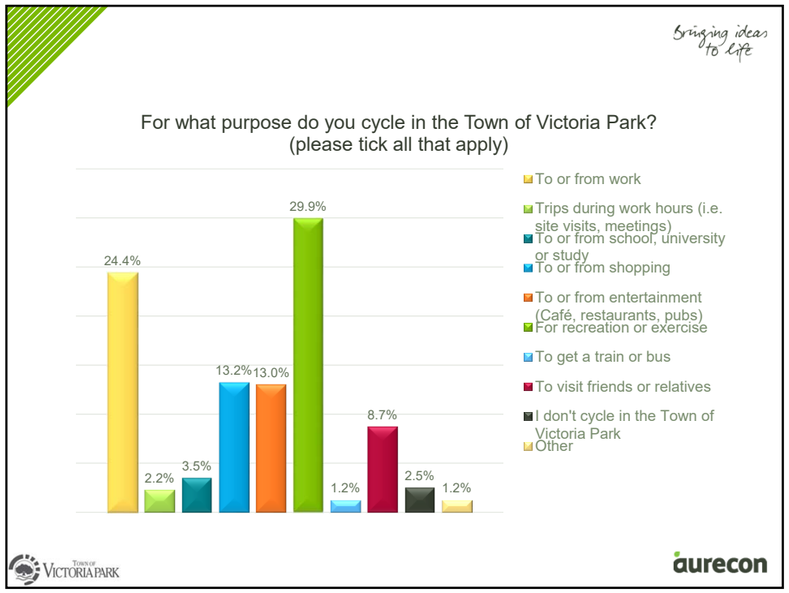


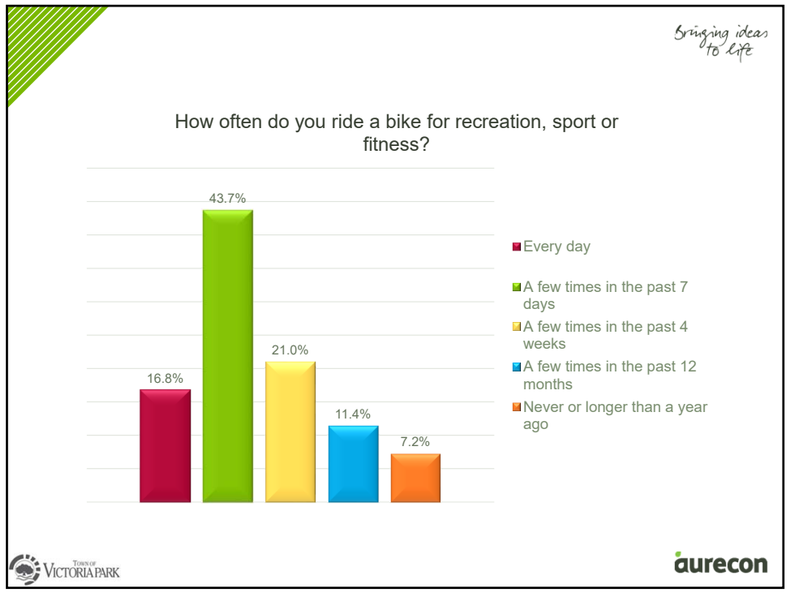


Appendix D
Community Survey – ToVP Summary









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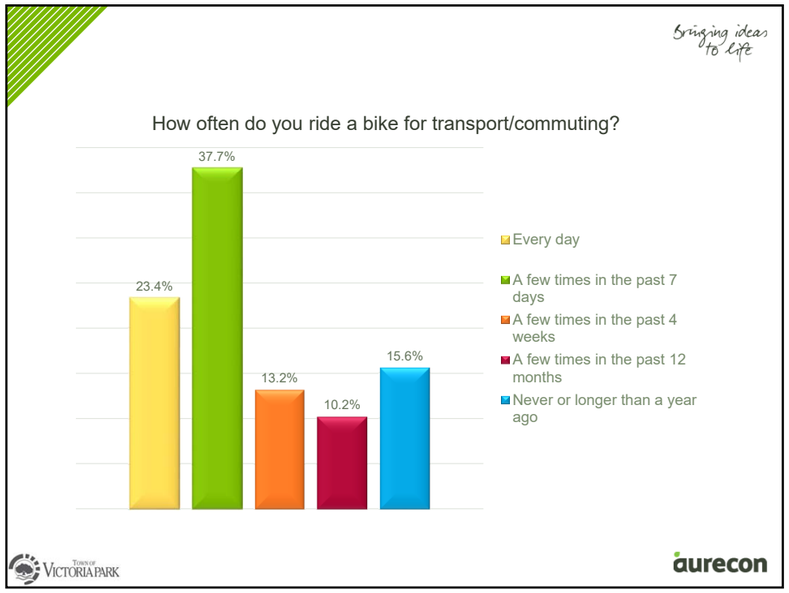

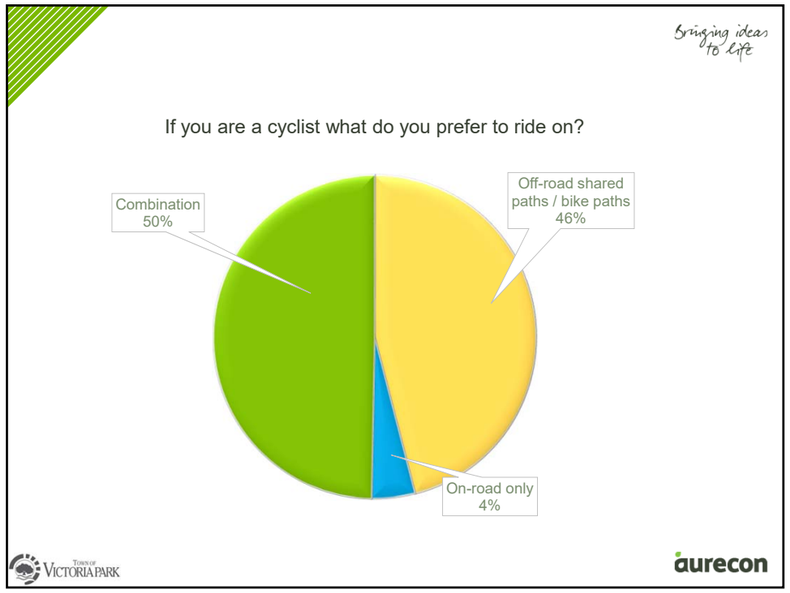

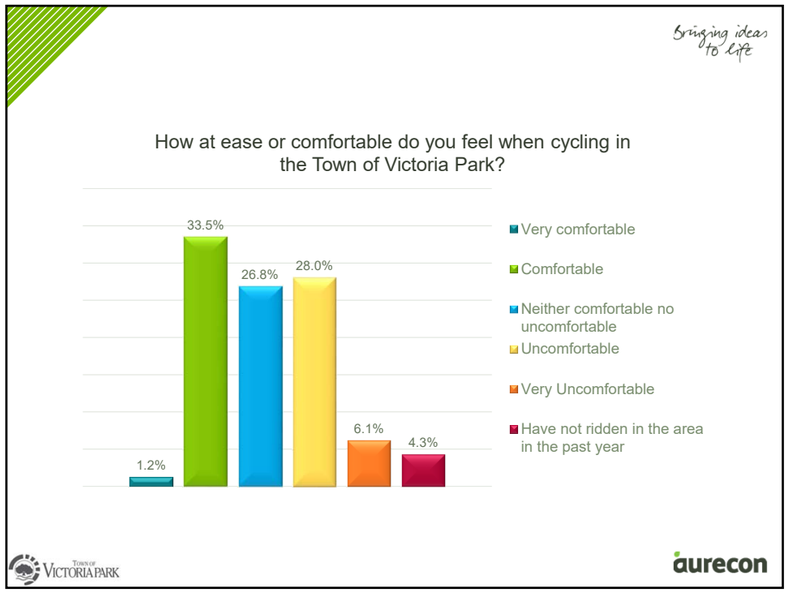

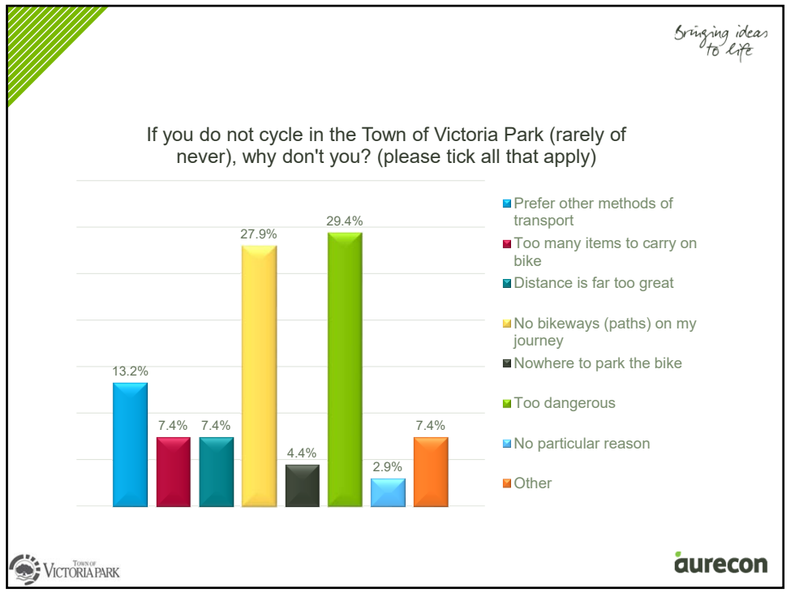

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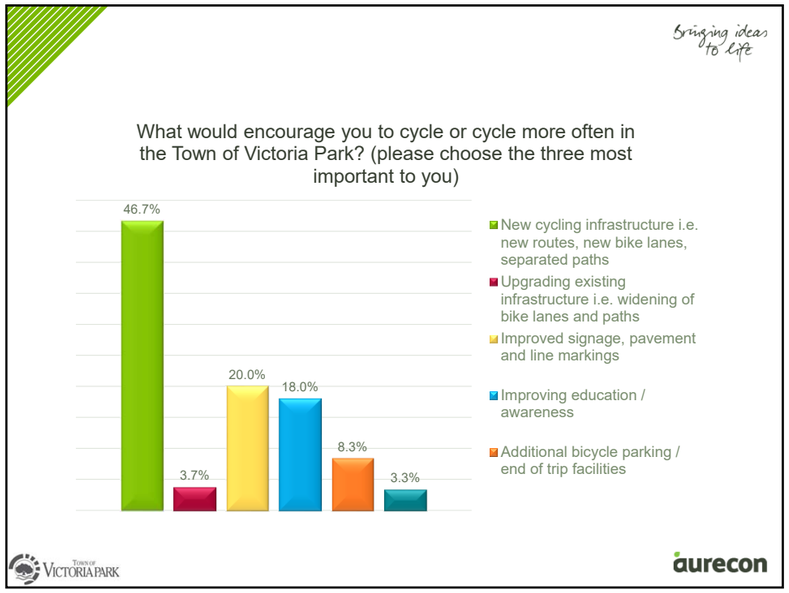
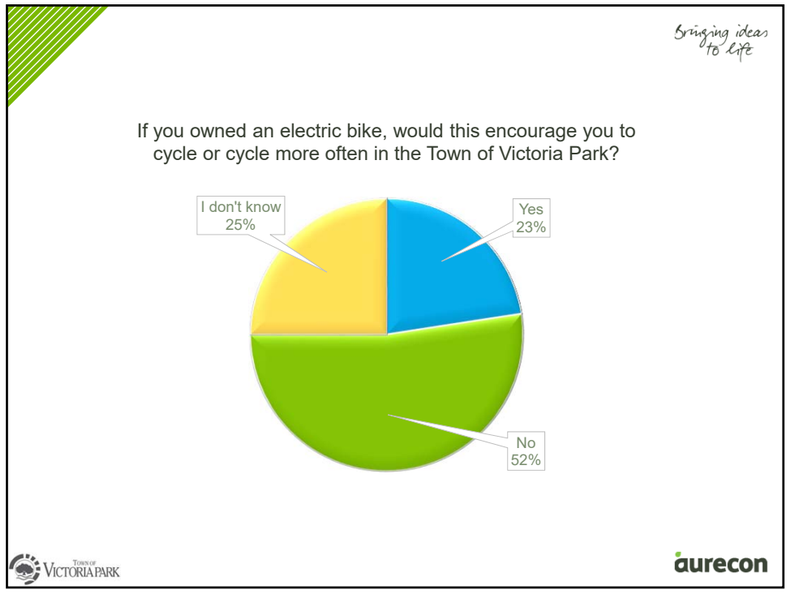
Community Survey – ToVP Summary





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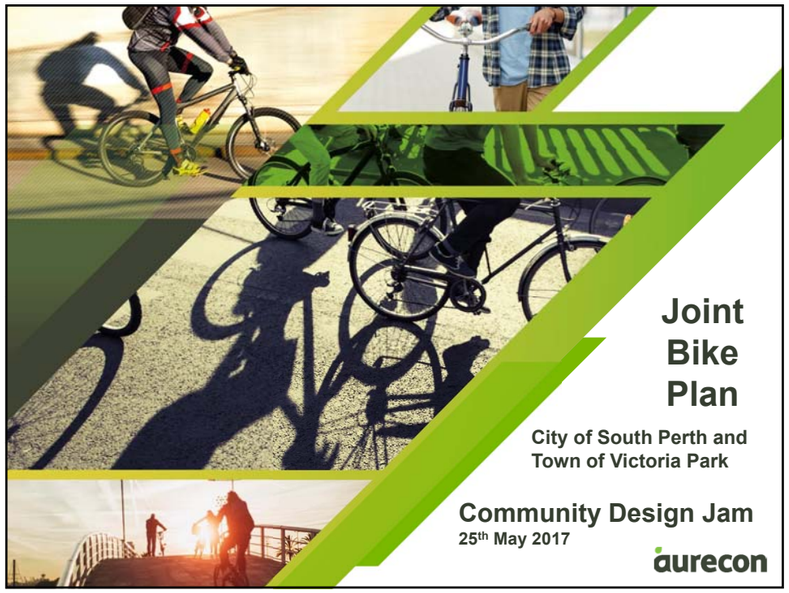
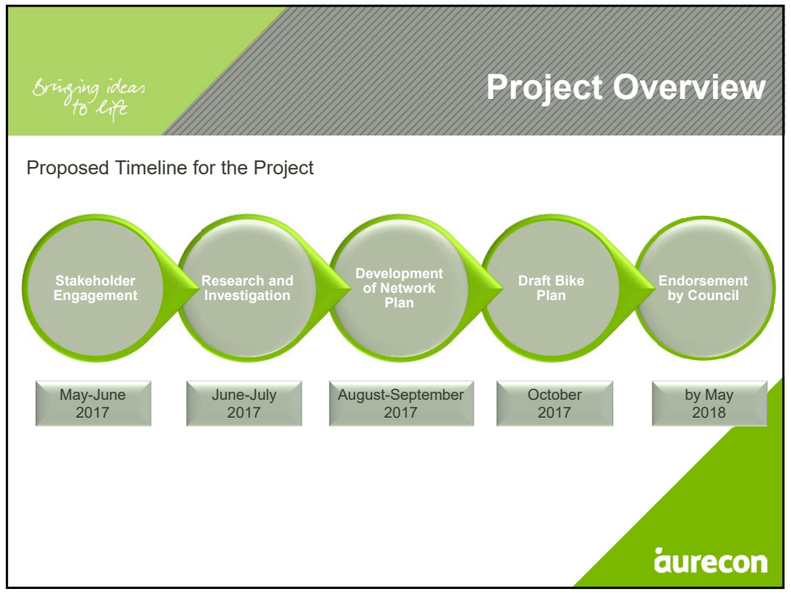
Community Design Jam – ToVP Summary





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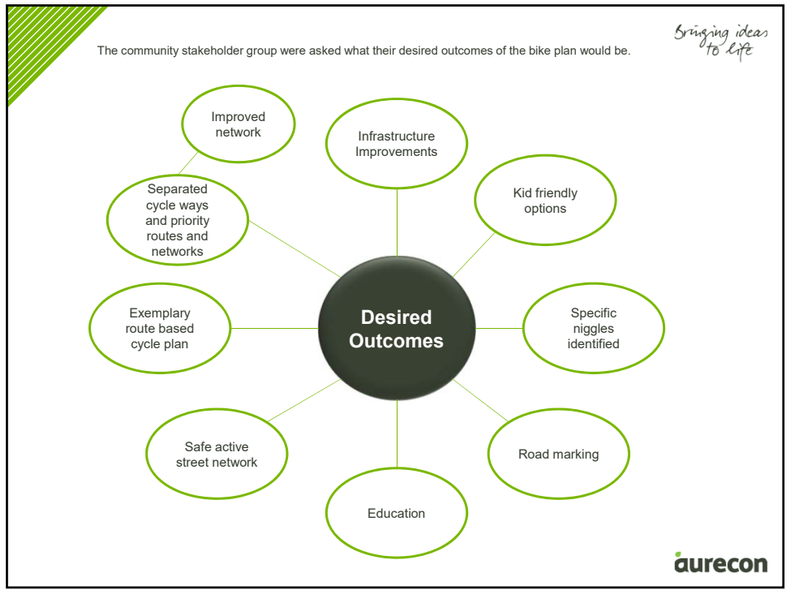

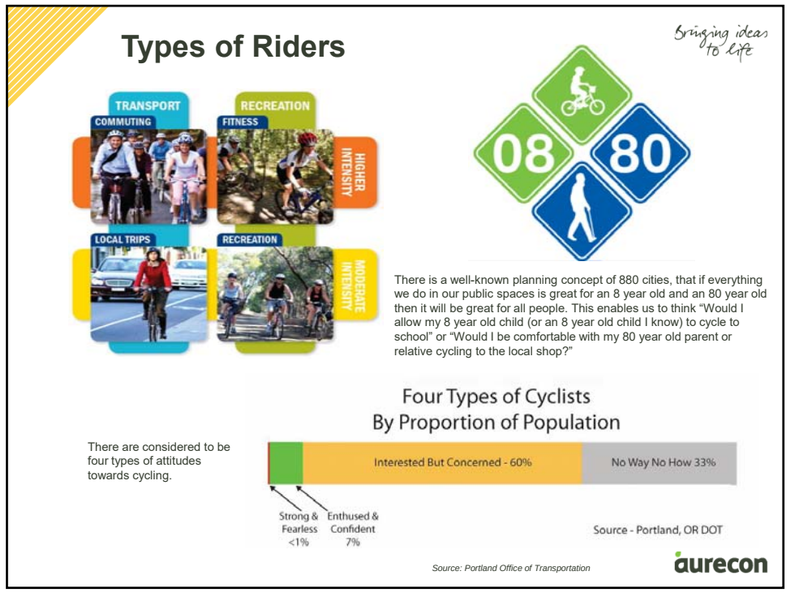

Appendix D
Community Design Jam – ToVP Summary

Cycling Infrastructure

Bringing ideas to life

On-Road Bicycle Lane

Examples of on-road infrastructure include signed on-road bicycle lanes or marked sealed shoulders, and bicycle boulevards which involve transforming low traffic local roads into slow-speed safe active streets for walking and cycling.

Bicycle Boulevard

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Cycling Infrastructure

Bringing ideas to life

Examples of off-road cycling infrastructure include shared paths for cyclists and pedestrians, and separated cycle paths for cyclists only.

Shared Path

Separated Bicycle Path

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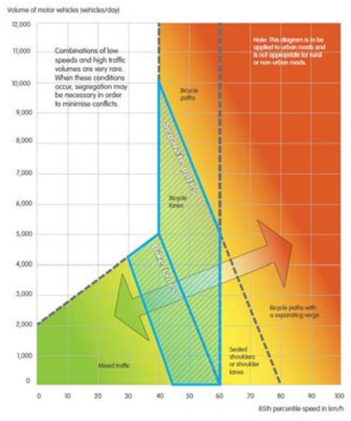
Cycling Infrastructure

Bringing ideas to life

Different types of infrastructure are often preferred for different types of riders, as indicated on the figure on the left.
The right figure identifies traffic volume and speed thresholds in relation to the type of infrastructure that should be installed.

	On-Road Bicycle Lanes	Off-Road Paths
Training 	✓	✗
Commuting 	✗/✓	✓
Local trips (i.e. shops, friends) 	✗	✓
Recreation 	✗	✓
School 	✗	✓



Source: adapted from Cycling Aspect of Austroads Guidelines by Bicycle Network Australia

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End of Trip Facilities

Bringing ideas to life

Examples of bicycle parking, including public racks or enclosed storage sheds, like at train stations.

Bicycle Racks

Secure Bicycle Storage

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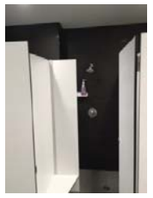
Appendix D
Community Design Jam – ToVP Summary

End of Trip Facilities

bringing ideas to life

Examples of lockers, showers and changing rooms, often located within private facilities such as workplaces.

Lockers



Shower Facilities

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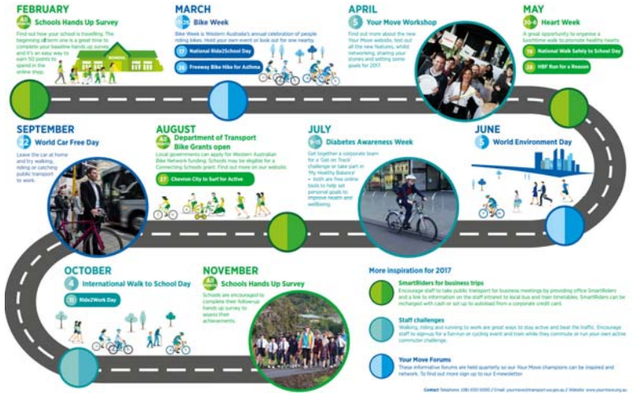
Behaviour Change

Department of Transport

your move – more ways to get there

An important aspect of the bike plan is to investigate soft solutions, which maximise the effectiveness of the harder infrastructure solutions. The DoT runs a very successful behaviour change program called Your Move which helps people find alternative, active ways to get to and from work, school and around their local community. The program has targeted specific local government areas, for example Cockburn, by helping people achieve their active transport goals through providing tailored information and resources as well as personalised coaching and feedback on progress.



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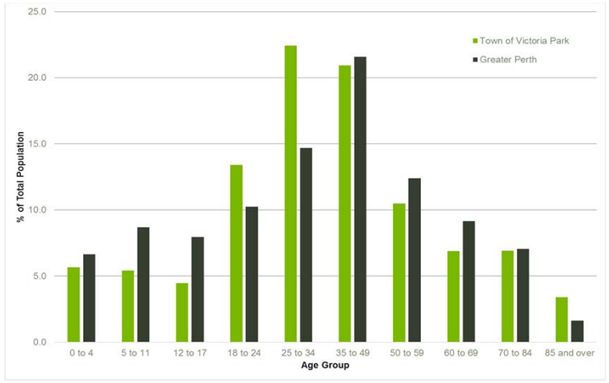
Previous Survey Data

bringing ideas to life

The following survey data specific to the Town of Victoria Park. The graph demonstrates the age profile for Town of Victoria Park residents in comparison to the greater Perth area. Note that this is taken from census data from 2011, with newer 2016 data expected to be released later this year.



*Sourced from 2011 Census data

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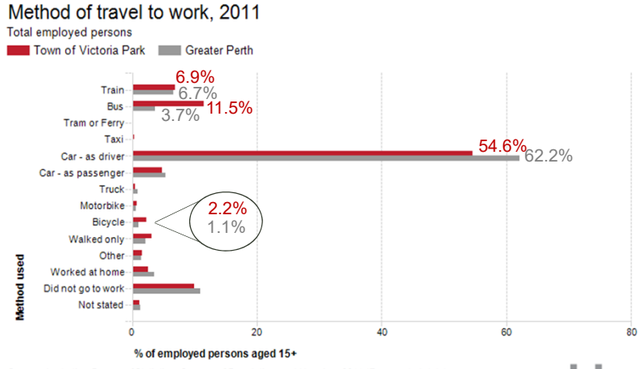
Previous Survey Data

bringing ideas to life

The below graph demonstrates how the Town of Victoria Park residents get to work, with car being the dominant mode choice, as with most of Perth. The graphs shows that 2.2% of residents cycle to work.



Source: Australian Bureau of Statistics, Census of Population and Housing, 2011 (Enumerated data)
Compiled and presented in profile.id by .id, the population experts.

.id the population experts

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Appendix D

Community Design Jam – ToVP Summary

Previous Survey Data

Bringing ideas to life

The below survey data is from the draft Healthy Vic Park Plan released earlier this year. Cycling infrastructure was rated second in public health priorities, and people would like to see more cycling infrastructure in their local neighbourhood to support a healthier lifestyle.

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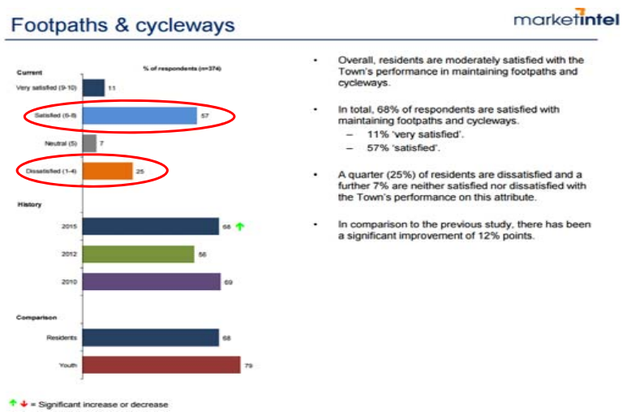
Previous Survey Data

Bringing ideas to life

The below data is from the Town of Victoria Park 2015 Community Perception Survey Report showing that 2/3rds of residents are generally satisfied with footpaths and cycleways in the Town, however there is plenty of room to improve.



- Overall, residents are moderately satisfied with the Town's performance in maintaining footpaths and cycleways.
- In total, 68% of respondents are satisfied with maintaining footpaths and cycleways.
  - 11% 'very satisfied'.
  - 57% 'satisfied'.
- A quarter (25%) of residents are dissatisfied and a further 7% are neither satisfied nor dissatisfied with the Town's performance on this attribute.
- In comparison to the previous study, there has been a significant improvement of 12% points.

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Integrated Transport and Movement Plan

Bringing ideas to life

The image demonstrates the key cycling infrastructure improvements recommended in the Integrated Transport and Movement Plan for the Town completed in 2013.

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PERTH & PEEL TRANSPORT PLAN

Bringing ideas to life

The WA Transport Portfolio (the Department of Transport, Public Transport Authority and Main Roads) released the Perth and Peel Transport Plan @ 3.5million earlier this year.

In the Plan there are three key cycling network planning principles to be considered.

The Plan outlines a proposed strategic network for Perth, which the Joint Bike Plan will investigate further and help inform.

The Plan outlines four types of cycle routes and the corresponding infrastructure expected for each.

Cycling Network Planning Principles

1. Provide cycling infrastructure in a grid matrix layout
2. Separate cyclists from moving vehicles
3. Separate cyclists from pedestrians

PSPs	Shared paths of high standard, with grade separation at intersecting roads/railways
Strategic Routes	Shared paths of PSP standard (where possible), separated bi-directional cycle lanes, bicycle boulevards
Local Routes	Pavement markings and signage, bicycle boulevards, on-road cycle lanes
RSPs	Shared paths of PSP Standard

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Appendix D
Community Design Jam – ToVP Summary

Previous Survey Data

Bringing ideas to life

The below image was taken from Strava maps, the online tool that allows riders to log their cycling trips. The thicker lighter lines represent the heavier used roads. The tool is historically more commonly used for recreational trips, however is still a useful tool to capture the more frequently ridden roads.

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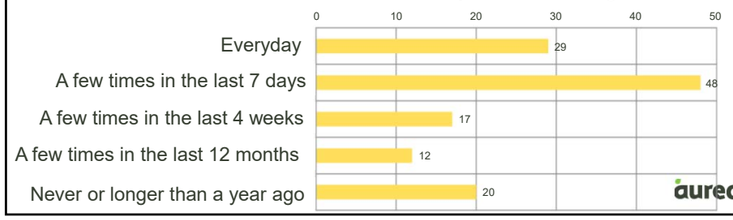
Online Survey Data Results to Date

Bringing ideas to life

How often do you ride a bike for **recreation sport or fitness**

How often do you ride a bike for **transport / commuting**



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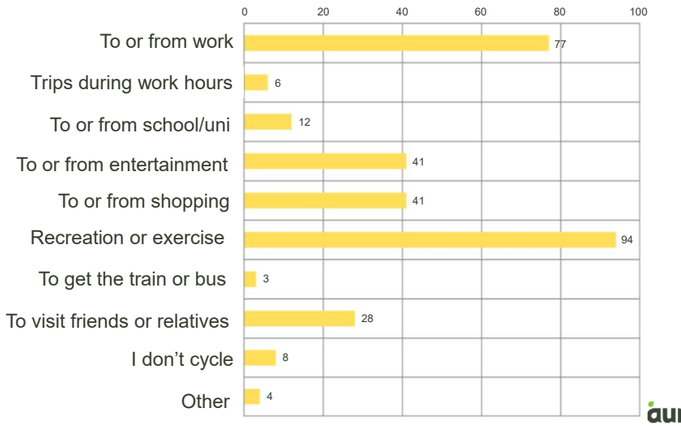
Online Survey Data Results to Date

Bringing ideas to life

For what purposes do you cycle in the Town of Victoria Park please tick all that apply



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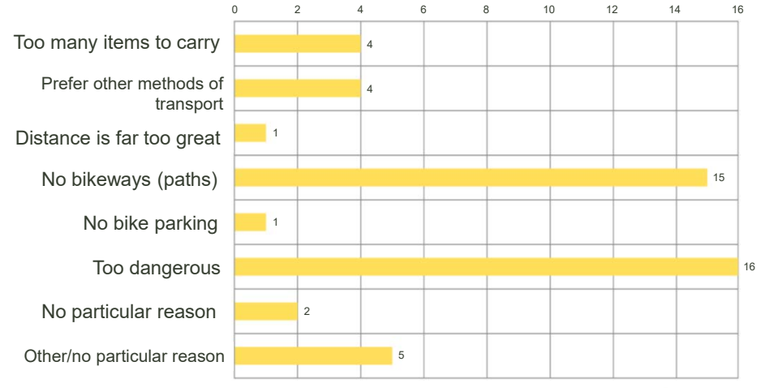
Online Survey Data Results to Date

Bringing ideas to life

If you do not cycle in the Town of Victoria Park rarely or never why dont you please tick all that apply



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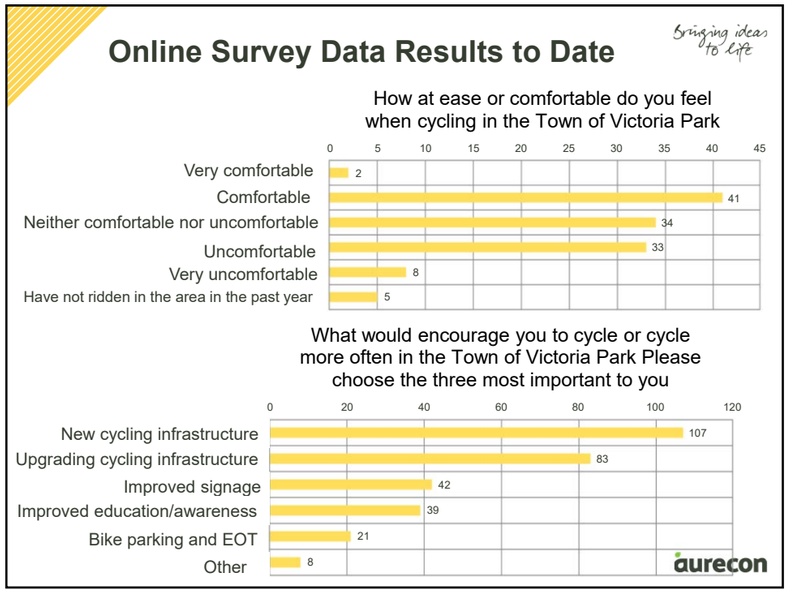
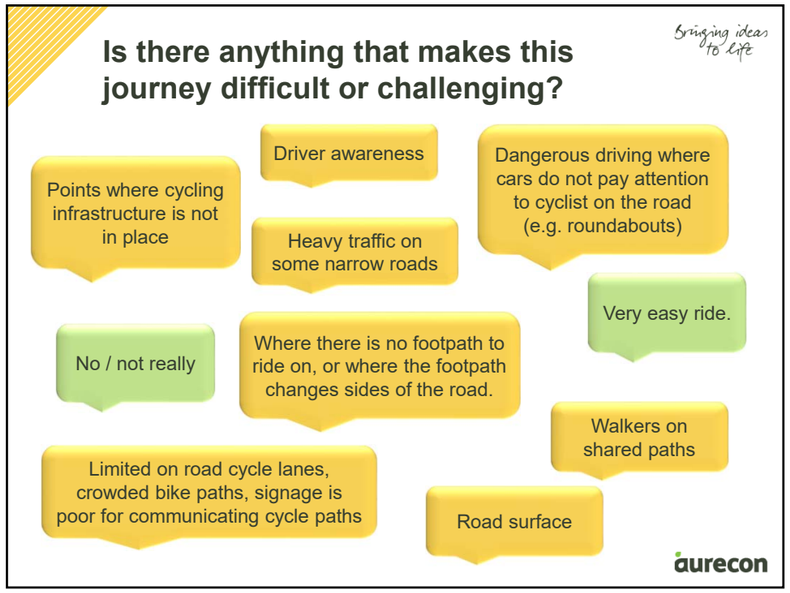
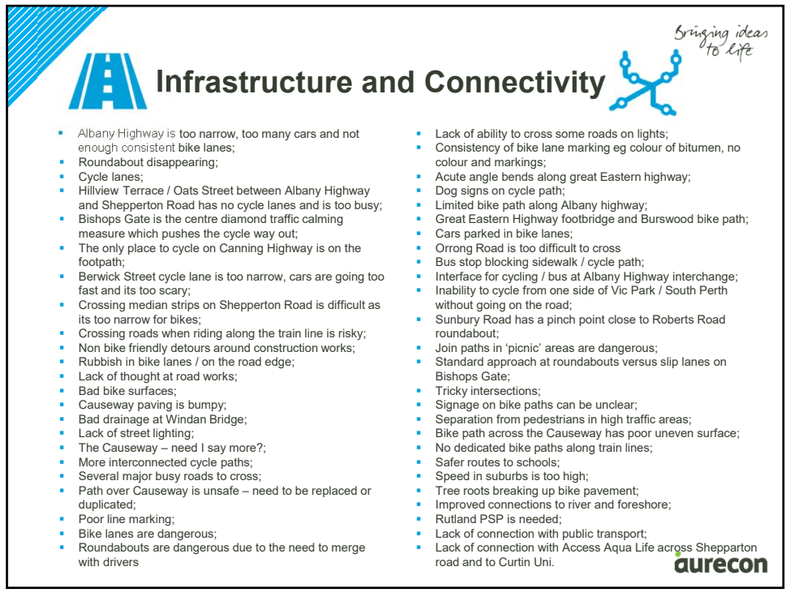
Appendix D
Community Design Jam – ToVP Summary







Appendix D
Community Design Jam – ToVP Summary

Bringing ideas to life

Council / Policy

- Lack of ease of finding where to lodge issues about infrastructure on website;
- Council website is shocking;
- No cyclist data or information on the website;
- 4 way stops at junctions on cycle routes are an issue;
- Belmont Council Linkage is needed;
- Engagement back to the community on the draft plan is required;
- We need a prioritised list of initiatives for public to comment on what they feel is most important;
- Innovative / cost effective solutions are what we are looking for;
- Need quick wins that the council can proceed without major funding;
- One clear rule – need now;
- Enforcement of parking and driving laws needs to be invested in;
- Looking / choosing expensive solutions is a barrier;
- Not right priorities on how to spend the money;
- No courage / leadership to implement changes;
- Knowledge of experienced staff that design infrastructure needs to be made use of;
- Not a priority for council;
- Lots of plans but no action;
- Helmet legislation is an issue;
- No follow up on enforcement by police to dangerous drivers; and
- Learn from Belmont, Bayswater and Vincent.

Maintenance

- Glass on footpaths is common;
- Potholes are common;
- Kerbside collection rubbish often left on path;
- Bushes grow into bike path;
- Rubbish on edge of roadway; and
- Sweeping of debris and broken glass is needed.

End of Trip Facilities

- Lack of bike racks at train stations, shopping centres, libraries and retail centres;
- Lack of bike racks on Albany Highway near shops;
- Bike parking / security at destinations needs to be improved;
- End of trip facilities at events are needed to encourage people;
- Not enough bike racks or storage near shops/cafes;
- Not enough parking along Albany Highway restaurants;
- No safe ways to get to Albany Highway; and
- Limited cycle parking near cafés and shops.

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Bringing ideas to life

Education / Attitude

- Lack of knowledge of road rules;
- No signs to tell pedestrians to keep left;
- BELL BELL BELL BELL;
- Drivers need to follow road rules;
- Cyclist education;
- Rider education;
- Walkers with no lights on bike paths;
- Cars assume right of way;
- Us versus them mentality;
- No or lack of empathy;
- Riding on footpaths, car reversing out past high fences;
- Pedestrian education that bikes can use footpaths;
- Communication between road / path users;
- Lack of understanding among users;
- Each feel entitled to own space;
- Car owner attitude – right to the road;
- Pedestrian / cycle conflict
- Pedestrian education – to not walking 3 abreast;
- Dogs cutting off cyclists;
- Better cyclist visibility;
- Tour de France riders – very fast;
- Riding on the footpath – explanation / education;
- Various skills of riders;
- Pedestrians wearing headphones;
- Roundabout etiquette;
- Drivers don't provide enough room for cyclists; and
- Walkers or runners have poor cyclist awareness.

Incentives

- Encouragement / incentives for more 'active' cyclists are needed;
- Cycle incentives for bicycle pathways of businesses do not exist;
- Encouragement of local social cycling amongst groups needs work; and
- Engagement with schools to encourage cycling / walking to school is a great potential.

Recreation

- Lack of child friendly facilities;
- Recreational cycling things are needed; and
- Lack of public cycling events.

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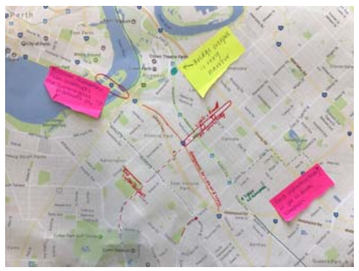
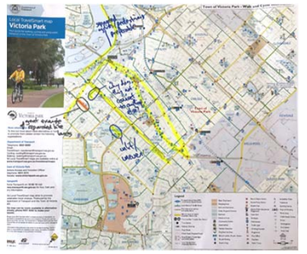
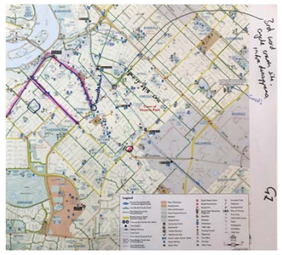
Bringing ideas to life

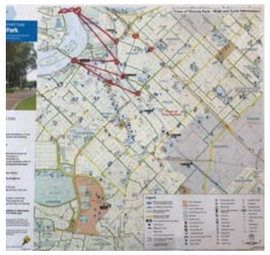
Key Issues and Opportunities Identified



Bringing ideas to life







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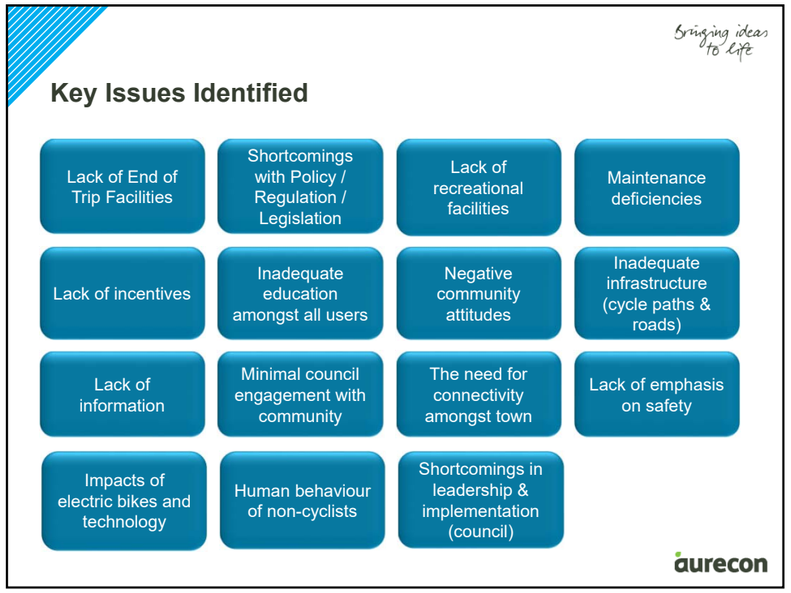
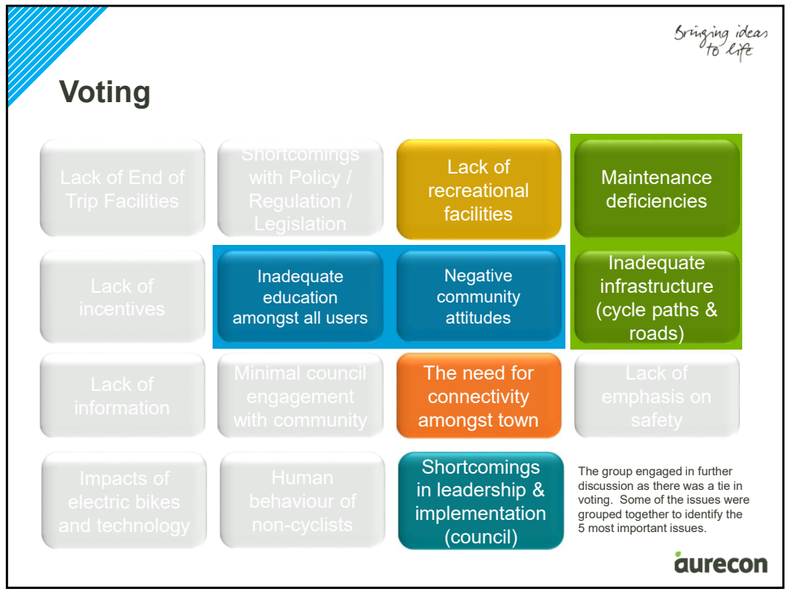
Appendix D

Community Design Jam – ToVP Summary





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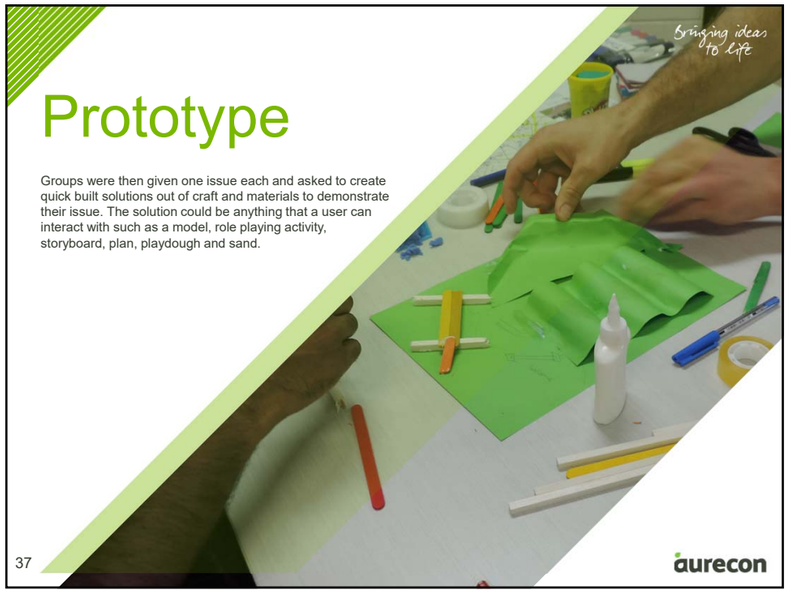


Bringing ideas to life
Inadequate Connectivity
41
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Bringing ideas to life
The need for leadership and Implementation by Council
NO ESCAPE
42
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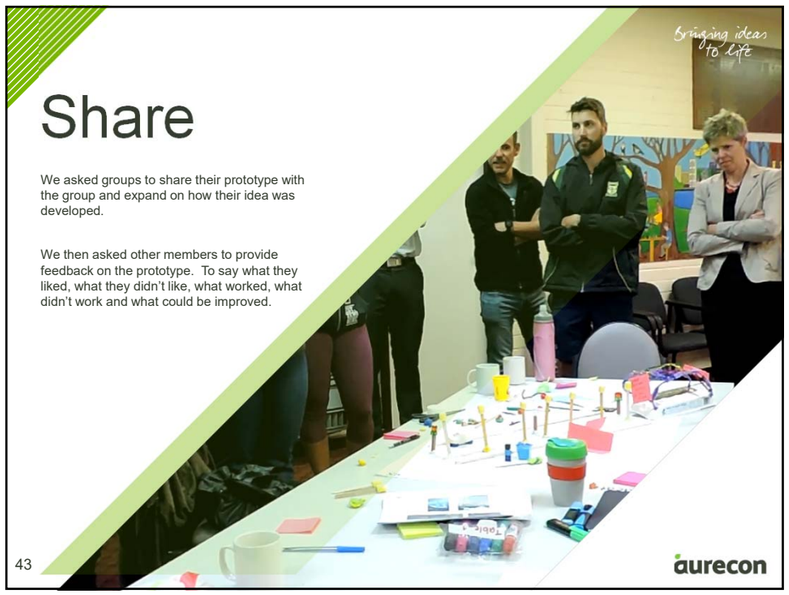
Bringing ideas to life
Share
We asked groups to share their prototype with the group and expand on how their idea was developed.
We then asked other members to provide feedback on the prototype. To say what they liked, what they didn't like, what worked, what didn't work and what could be improved.
43
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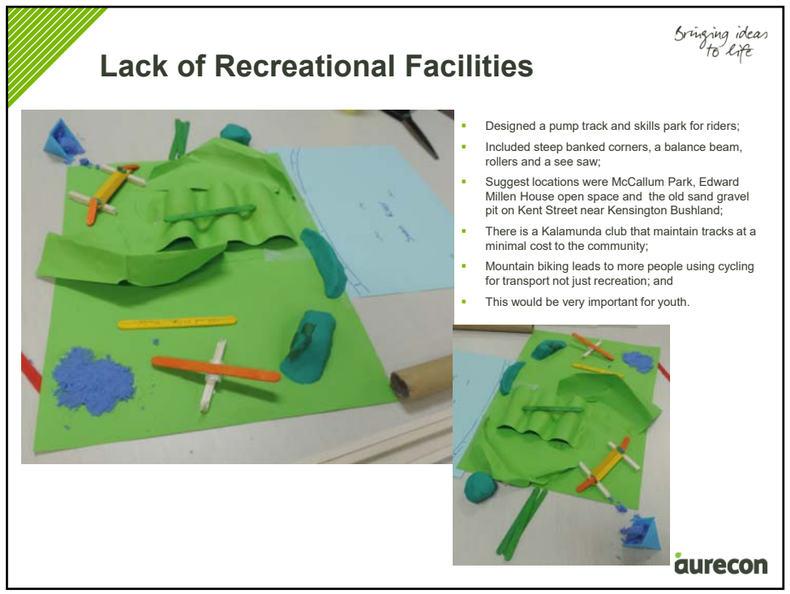
Bringing ideas to life
Lack of Recreational Facilities
Designed a pump track and skills park for riders;
Included steep banked corners, a balance beam, rollers and a see saw;
Suggest locations were McCallum Park, Edward Millen House open space and the old sand gravel pit on Kent Street near Kensington Bushland;
There is a Kalamunda club that maintain tracks at a minimal cost to the community;
Mountain biking leads to more people using cycling for transport not just recreation; and
This would be very important for youth.
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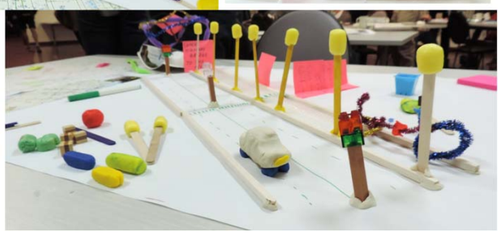
Appendix D
Community Design Jam – ToVP Summary

Bringing ideas to life

Infrastructure and Maintenance Deficiencies



- Utopia version of Albany Highway;
- Separated road and cycle path;
- Solar power generated cycle path;
- Sufficient lighting along the paths;
- Maintenance worker checking paths for consistency;
- Super highway bridge over the river; and
- Traffic lights to allow for traffic.

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Bringing ideas to life

Community Attitudes and Lack of Education

- 3 circle harmony approach for pedestrians, cyclist and motorists;
- The symbol could be painted on paths or roads;
- A campaign through social media, television and radio to promote education and awareness;
- "Its another human being"; and
- "I feel like getting a jersey that says I am a human".

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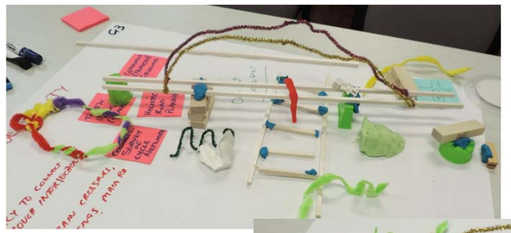
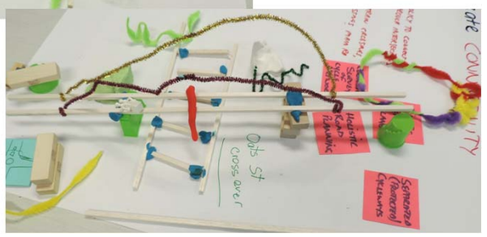
Bringing ideas to life

Inadequate Connectivity





- Pinch points such as where you can cross the river, highways and train lines and connecting those in with cycle paths;
- Example of crossing the railway with an elaborate green bridge;
- Frustrated by cycle paths stopping at traffic intersections and safety concerns associated with those;
- Suggested that designers and planners ride in the areas and conduct an audit; and
- Suggested a policy change with Main Roads about signalised intersections.

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Bringing ideas to life

The need for Leadership and Implementation by Council

- Need the leadership of our council to be different;
- Allow the town to be very bike friendly;
- The council member has ridden to his speech and left the bike at the bottom, he has risen above the other council members and saying this is the way we do it;
- Lobbying governments for funding;
- Bike paths everywhere;
- Implementation of all plans for commuters and recreational users; and
- Promoting a healthier active lifestyle; and
- Taking a risk and showing people that things can be better.

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Appendix D

Community Design Jam – ToVP Summary

Appendix E – Detailed Infrastructure Audit Results (ToVP)

Detailed Link Results for the ToVP

Link Reference	Street Name	Between	Description	Photos	Comments / Issues	Suggestions
L1-A	Town of Victoria Park Foreshore Path	Ellam Street and The Causeway	**Separated Cycle Only Path (off-road)** Approximately 3.0m wide off-road path. The path includes appropriate markings, signage and lighting along most of the alignment. At the path connections to the Causeway bridge (south side), the path becomes shared with pedestrians.	 	▪ This provides part of a key route for commuters and recreational cyclists, who visit the Swan River foreshore and Perth CBD. ▪ The path is high quality and in good condition, however wayfinding is lacking. ▪ Lighting and sightlines are good, creating a suitable cycle environment. ▪ There is a lack of high quality lighting at the Causeway underpass. ▪ Legibility at the connection of the separated and shared path is poor, which can potentially mislead pedestrians onto the separated cycle-only path.	▪ The shared path pavement marking on the cycle only path should be removed, and a small footpath connection should be constructed to direct pedestrians appropriately. ▪ Investigate improvement of lighting at the Causeway underpass. ▪ Install wayfinding along route particularly at Taylor Street and the Causeway. This should form part of an overall wayfinding strategy (as outlined in Section 15.3.1).
L1-B	Town of Victoria Park Foreshore Path	The Causeway and Windan Bridge	**Shared Path (off-road)** Approximately 3.0m wide off-road path.		▪ This provides part of a key route for commuters and recreational cyclists, who visit the Swan River foreshore and Perth CBD. ▪ There is a lack of wayfinding along the path, particularly at major junctions such as the shared path connection to the Great Eastern Highway. ▪ Lighting is lacking along some sections of the path including at locations with heavy foliage.	▪ Liaise with the Burswood Park Board and investigate the installation of a separated footpath adjacent to the existing shared path and convert the shared path to a cycle only path. It is recommended that a permanent cycle counter or a real-time speed display sign (north of Crown) is installed to monitor the use and behaviour on the foreshore path following the completion and opening of the new Perth Stadium. This will assist in determining the warrant for path separation. ▪ Investigate installation of lighting at gaps along share path, such as the section just north of the Causeway. ▪ Investigate the ponding issues along the shared path at the junction south of the Windan Bridge. ▪ Install wayfinding along the route particularly at junctions with other paths, directing users to key destinations within ToVP (i.e. Great Eastern Highway shared path north of the Causeway) and key destinations such as Crown Perth and Perth Stadium. This should form part of an overall wayfinding strategy (as outlined in Section 15.3.1).
L2 - A	Great Eastern Highway	Burswood Park and Great Eastern Highway Overpass	**Shared Path (off-road)** Approximately 3.0m wide off-road path through part of Burswood Park and along the north side of		▪ This provides part of the east-west connection to the Swan River Foreshore and the proposed Rutland Avenue/ Goodwood Parade PSP. ▪ There is a lack of wayfinding along the path, at junctions and at the Great Eastern Highway Overpass.	▪ It is recommended to install a new 2.5 to 3.0m high quality shared path on the northern side of Great Eastern Highway to bypass the existing bus shelter. The path should connect to the existing ramp which connects to the overpass. ▪ Install wayfinding along the route particularly at the intersection with the shared paths at Foreshore, Victoria

Link Reference	Street Name	Between	Description	Photos	Comments / Issues	Suggestions
			Great Eastern Highway.		▪ A significant conflict exists at the bus stop on the Great Eastern Highway, just east of the overpass. At this location, the path narrows increasing the likelihood of conflicts between cyclists and bus patrons.	Park Drive and the Great Eastern Highway Overpass. This should form part of an overall wayfinding strategy (as outlined in Section 15.3.1).
L2 - B	Great Eastern Highway	Great Eastern Highway Overpass and Orrong Road Overpass	**Shared Path (off-road)** Approximately 3.0m wide off-road path on south sides of Great Eastern Highway and the Orrong Road off-ramp.		▪ This provides part of the east-west connection to the Swan River Foreshore from the Orrong Road Overpass (into Belmont) and the proposed Rutland Avenue/ Goodwood Parade PSP. ▪ Some sections of the path are narrow and lack formalised pavement and line marking. ▪ Holding rails are missing at both sides of the Cornwall Street crossover and at the median. ▪ Some sections of the path have debris and overgrown vegetation, particularly at the Orrong Road off-ramp.	▪ Liaise with Main Roads to install holding rails on both approaches of the Cornwall Street crossover and on the median. ▪ Ensure the shared path is maintained regularly through regular liaison with Main Roads.
L3	Gallipoli Street	Orrong Road Overpass and Rutland Avenue/ Victoria Park Station	**On-Road (unmarked)** The road currently has no cycling facilities and is generally 10m wide, with one traffic calming device. This section is labelled on the DoT Your Move Map as a local bicycle friendly route.		▪ This provides a local east-west connection between Victoria Park Station and the Orrong Road overpass (leading into City of Belmont), and Surrey Road safe active street. ▪ The existing path lacks width and is along one side only at sections. ▪ Parked cars, roundabouts and traffic calming devices put on-road cyclists in dangerous positions. ▪ The narrowing of roads at intersections (‘nibs’) also increase the chances of conflicts between cyclists and vehicles. ▪ A small section of the route is part of a bus route. ▪ There is a lack of wayfinding along the road, particularly for key destinations such as Orrong Road Overpass and Victoria Park Station.	▪ This route is proposed to form part of the long term strategic network as a local route. There is potential for this route to be developed into a Safe Active Street. ▪ Install wayfinding along route particularly at the Maple Street and Rutland Avenue intersections. This should form part of an overall wayfinding strategy (as outlined in Section 15.3.1).

Link Reference	Street Name	Between	Description	Photos	Comments / Issues	Suggestions
L4 - A	Bishopsgate Street	Rutland Avenue and Kent Street	**On-Road (marked**) This road currently has appropriately marked red-asphalt on-road bike lanes and consists of a good surface quality with green pavement at intersections. A 1.8m wide off-road concrete path with red painted pavement is located along the east side from Rutland Avenue to Goddard Street and the remaining section is 1.6m wide concrete.	 	▪ This provides a local northwest-south east connection between Victoria Park Station and Angelo Street. ▪ There is a lack of off-road bypass options on the approaches and departures for cyclists travelling through the Kent Street intersection. ▪ The section of path along the east side of Bishopsgate Street south of Goddard is in poor condition with uneven pavement. It is noted that this is adjacent to Lathlain Park, which is planned to be redeveloped. ▪ Existing traffic volumes along the road are approximately 4000 vehicles per day and the speed limit is 50km/hr.	▪ Install appropriate off-road bypass paths with smooth transitions for on-road cyclists on the Bishopsgate Street approaches and departures to the roundabout ▪ Consideration of off-road and on-road cyclists is required along this route, as part of the Lathlain Park Redevelopment. Existing on-road facilities located adjacent to the development should be maintained, while upgrading of the off-road facilities to a high quality shared path standard should be considered as part of any works.
L4 - B	Bishopsgate Street	Kent Street and Archer Street	**On-Road (marked**) This road currently has appropriately marked red-asphalt on-road bike lanes and consists of a good surface quality. Two traffic calming devices are located along the section.		▪ This provides a local northwest-southeast connection between Victoria Park Station and Angelo Street. ▪ The on-road bike lanes discontinue approximately 100m north of the Angelo Street roundabout, forcing cyclists to either exit the road or cycle with traffic. There is currently a lack of suitable options to enter/exit the roadway at this location. ▪ Existing traffic volumes along the road are approximately 3,000 vehicles per day and the speed limit is 50km/hr.	▪ Remove “All Bicycles” signage at the Gloucester Street intersection, which indicates to cyclists to leave the road. ▪ Consider extending the on-road cycle lanes to the Angelo Street roundabout as part of any future resurfacing works, with appropriate off-road bypass paths at the northwest leg of the roundabout. Install off-road bypass paths with smooth transitions where the on-road cycle lanes currently discontinue.
L5 - A	Kent Street	Manning Road and Hayman Road	**Sealed Shoulder (on-road) and Shared Path (off-road)** Approximately 1.5m on-road bike lanes (sealed shoulder), which discontinue at the Manning Road intersection. A 3.0m wide off-road path runs along the east side of the road. The path includes appropriate pavement		▪ This provides a key strategic route that connects multiple destinations including Curtin University, Kent Street Senior High School, the Leisure Life Centre, Albany Highway commercial precinct and Lathlain Park. ▪ Existing traffic volumes along the road are approximately 22,000 vehicles per day and the speed limit is 70km/hr. ▪ This is a high frequency bus route which creates potential conflicts for on-road cyclists at bus stops ▪ The sealed shoulder is not surfaced with red pavement, appropriately signed or marked, and	▪ Replace the existing concrete footpath on the eastern side of Kent Street (just north of Beazley Avenue) with a 2.5m-3.0m high quality red asphalt shared path as proposed in the Kent Street project, outlined in Section 15.3. Liaison with Curtin University is required. ▪ It is recommended that when the next resurfacing works along Kent Street are undertaken that this entire section of on-road cycle lanes is reviewed. The cycle lanes should be sealed in red asphalt at a minimum width of 1.5m with consideration of protection. In addition, green asphalt should be used for the cycle lanes across all side intersections. Where possible, the existing traffic lane width should be narrowed to the minimum possible to facilitate a wider cycle lane.

Link Reference	Street Name	Between	Description	Photos	Comments / Issues	Suggestions
			and line markings along most of the alignment. A 2.0 to 3.0m concrete path and on-road bike lane run lane along the west side which are located within CoSP. Only the eastern (southbound) carriageway is located within ToVP, which is the only one referred from here.		may cause confusion for cyclists wishing to use the facility. ▪ There is currently a lack of off-road bypass paths at the Manning Road intersection. ▪ A gap in the shared path exists with approximately 230m of narrow unmarked path, north of Beazley Avenue.	▪ Install wayfinding along route particularly at Manning Road and Curtin University Main Street. This should form part of an overall wayfinding strategy (as outlined in Section 15.3.1).
L5 - B	Kent Street	Hayman Road and Jarrah Road	**Sealed Shoulder (on-road) and Shared Path (off-road)** Approximately 1.5m sealed shoulder, which discontinue at some intersections and sections of road. Only the eastern carriageway (southbound) is located within ToVP which is only referred to from here. A 2.0 to 2.5m asphalt path runs along the east side of Kent Street.	 	▪ This provides a key strategic route that connects multiple destinations including Curtin University, Kent Street Senior High School, the Leisure Life Centre, Albany Highway commercial precinct and Lathlain Park. ▪ On-road bike lanes are not surfaced with red asphalt, or marked with bike symbols and signage. ▪ There is currently a lack of off-road bypass paths at the Hayman Road, Dick Perry Avenue and Jarrah Road intersections, for the Kent Street approaches and departures. ▪ No on-road bike lane is located along the section between Dick Perry Avenue and Jarrah Road. ▪ There is a lack of formalised pavement and line marking along the shared path and it is cracked and uneven along sections. ▪ There is no lighting along the path affecting personal security and making the path unappealing during the evening. ▪ Median crossings lack holding rails and the required widths for cyclists along Kent Street at the Hayman Road and Jarrah Road intersections. ▪ This is a high frequency bus route which creates potential conflicts for on-road cyclists at bus stops. ▪ There is a lack of wayfinding along the route.	▪ Replace existing footpath on the eastern side of Kent Street with a 3.0m wide red asphalt shared path as proposed in the Kent Street prioritised project (outlined in Section 15.3). ▪ In collaboration with the CoSP, install new 1.5m on-road cycle lanes as proposed in the Kent Street prioritised project (outlined in Section 7.2). ▪ In collaboration with CoSP, install holding rails and shift median crossings so that adequate width is provided (minimum 2.5m) at the Kent Street legs of the Hayman Road intersection. ▪ Install holding rails at the Jarrah Road median crossings. ▪ Install wayfinding along route particularly at Hayman Road, Turner Avenue (Technology Park) and Jarrah Road. This should form part of an overall wayfinding strategy (as outlined in Section 15.3.1).

Link Reference	Street Name	Between	Description	Photos	Comments / Issues	Suggestions
L5 - C	Kent Street	Jarrah Road and Gloucester Street	**Bicycle Lane (on-road) and Shared Path (off-road)** Approximately 1.5m on-road bike lanes, which discontinue at some intersections. A shared path runs along the north side of Kent Street, varying in surface material (asphalt and concrete) and width (1.6m to 4.0m).		▪ This provides a key strategic route that connects multiple destinations including Curtin University, Kent Street Senior High School, the Leisure Life Centre, Albany Highway commercial precinct and Lathlain Park. ▪ Existing traffic volumes along the road are approximately 12,000 vehicles per day and the speed limit is 60km/hr. ▪ This is a high frequency bus route. ▪ On-road bike lanes are not surfaced with red asphalt west of Berwick Street. ▪ There is currently a lack of off-road bypass paths at the Etwell Street, Devenish Street and Berwick Street intersections. ▪ There is a lack of formalised pavement and line marking along the shared path and it lacks adequate width and surface quality at sections. ▪ A high number of driveway crossovers are located on the shared path between Berwick Street and Gloucester Street. ▪ There is a lack of wayfinding along the route.	▪ Formalise the existing shared path on the northern side by including pavement marking and signage as proposed in the Kent Street prioritised project (outlined in Section 15.3). ▪ It is recommended that when the next resurfacing works along Kent Street are undertaken that this entire section of on-road cycle lanes is reviewed. The cycle lanes should be sealed in red asphalt at a minimum width of 1.5m with consideration of protection. In addition, green asphalt should be used for the cycle lanes across all side intersections. Where possible, the existing traffic lane width should be narrowed to the minimum possible to facilitate a wider cycle lane. ▪ Remove “All Bicycles” signage at the Gloucester Street intersection, which indicates to cyclists to leave the road. ▪ Install wayfinding along route particularly at Berwick Street (south) and Gloucester Street. This should form part of an overall wayfinding strategy (as outlined in Section 15.3.1).
L5 - D	Miller Street	Gloucester Street and Bishopsgate Street	**Bicycle Lane (on-road) and Shared Path (off-road)** Approximately 1.5m on-road bike lanes, which discontinue at some intersections. A shared path runs along the south side of Kent/Miller Street, varying in quality and width (1.6m to 2.5m).	 	▪ This provides a key strategic route that connects multiple destinations including Curtin University, Kent Street Senior High School, the Leisure Life Centre, Albany Highway commercial precinct and Lathlain Park. ▪ Existing traffic volumes along the road are approximately 12,000 vehicles per day and the speed limit is 60km/hr ▪ This is a high frequency bus route. ▪ On-road bike lanes lack continuity, and are not surfaced with red asphalt east of Sunbury Road. ▪ During the site visit, several locations along the bike lanes were being excavated for other works. ▪ The Kent Street/Albany Highway/Miller Street intersection is a barrier to cyclists, with insufficient space for cyclists on and off-road.	▪ Upgrade the existing footpath to a 2.5m-3.0m red asphalt shared path with appropriate pavement markings and signage on the southern side of Miller Street, as proposed in the Kent Street prioritised project (outlined in Section 15.3). ▪ It is recommended that when the next resurfacing works along Miller Street are undertaken that this entire section of on-road cycle lanes is reviewed. The cycle lanes should be sealed in red asphalt at a minimum width of 1.5m with consideration of protection. In addition, green asphalt should be used for the cycle lanes across all side intersections. Where possible, the existing traffic lane width should be narrowed to the minimum possible to facilitate a wider cycle lane. ▪ Install wayfinding along route particularly at Albany Highway and Bishopsgate Street. This should form part of an overall wayfinding strategy (as outlined in Section 15.3.1).

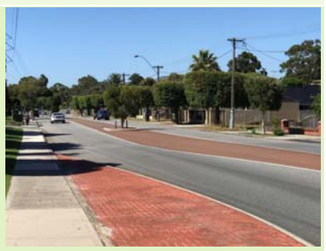
Link Reference	Street Name	Between	Description	Photos	Comments / Issues	Suggestions
					▪ There is currently a lack of off-road bypass paths at the Albany Highway, Shepperton Road and Bishopsgate Street intersections. ▪ There is a lack of formalised pavement and line marking along the shared path and it lacks adequate width and surface quality at sections. Wayfinding is also lacking along the path and at key intersection, such as Albany Highway. ▪ There is a lack of wayfinding along the route.	
L5 - E	Roberts Road	Bishopsgate Street and Orrong Road	**Bicycle Lane (on-road)** Approximately 1.5m on-road bike lanes, which discontinue at some intersections.		▪ This provides a key strategic route that connects multiple destinations including Curtin University, Kent Street Senior High School, the Leisure Life Centre, Albany Highway commercial precinct and Lathlain Park. ▪ Concrete paths located along most of both sides of the road. This lacks formalised pavement and line marking, width and surface quality. ▪ There is a lack of holding rails on the median crossing at Orrong Road. ▪ There is a lack of wayfinding along the route.	▪ Upgrade the existing footpath to a 2.5m-3.0m red asphalt shared path with appropriate pavement markings and signage on the southern side of Roberts Road, as proposed in the Kent Street prioritised project (outlined in Section 15.3). ▪ It is recommended that when the next resurfacing works along Roberts Road are undertaken that this entire section of on-road cycle lanes is reviewed. The cycle lanes should be sealed in red asphalt at a minimum width of 1.5m with consideration of protection. In addition, green asphalt should be used for the cycle lanes across all side intersections. Where possible, the existing traffic lane width should be narrowed to the minimum possible to facilitate a wider cycle lane. ▪ As part of other works, the intersection of Orrong Road/Roberts Road is planned to be modified to remove the right turn movement out of Roberts Road. As part of the works consolidated pedestrian/cyclist crossing at Orrong Road with holding rails should be provided. ▪ Install wayfinding along route particularly at Orrong Road. This should form part of an overall wayfinding strategy (as outlined in Section 15.3.1).
L6-A	Berwick Street	Canning Highway and Kent Street	**Sealed Shoulder (on-road)** This road currently has no cycling facilities and is generally 12.5m wide. A 1.5m sealed shoulder is located along each side of the road, which discontinues at some sections.		▪ This provides part of a north-south connection between the City of Canning and the Victoria Park foreshore. ▪ Existing traffic volumes along the road are approximately 20,000 vehicles per day and the speed limit is 60km/hr. ▪ This road is part of a bus route. ▪ The sealed shoulder is not surfaced with red pavement, appropriately signed or marked, and may cause confusion for cyclists wishing to use the facility.	▪ Install advanced cyclist stop boxes on the southern approach of the Kent Street intersection, as proposed in the Kent Street prioritised project (outlined in Section 15.3). ▪ This section of Berwick Street is constrained and caters for high traffic volumes and is a bus route. As such, an alternative route for cyclists is proposed along the parallel Gloucester Street which is proposed to be developed into a Safe Active Street. Cyclists can be directed along Kent Street to Gloucester Street and subsequently the existing underpass at Hordern Street.

Link Reference	Street Name	Between	Description	Photos	Comments / Issues	Suggestions
					▪ The on-road bike lanes discontinue before the Kent Street intersection, which puts cyclists at dangerous positions with general traffic. ▪ There is a lack of pedestrian/cycle lanterns at the Kent Street signalised intersection. ▪ Traffic lanes along the road are narrow, with a painted and concrete median located along the road generally 1.5m wide. ▪ The existing footpath lacks width and surface quality, and is often obstructed by street furniture (i.e. at bus stops and sign posts). ▪ Challenging gradients are located along the route, increasing effort for cyclists.	
L6-B	Berwick Street	Kent Street and Hill View Terrace	**Bicycle Lane (on-road)** Approximately 1.5m on-road bike lanes, which discontinues at some sections. The road is generally 12.5m wide.		▪ This provides part of a north-south connection between the City of Canning and the Victoria Park foreshore. ▪ Existing traffic volumes along the road are approximately 20,000 vehicles per day and the speed limit is 60km/hr. ▪ This road is part of a bus route. ▪ On-road bike lanes are not surfaced with red asphalt, or marked with bike symbols and signage. ▪ The on-road bike lane along the northbound carriageway discontinues south of Whittlesford Street and north of Sussex Street, and lack suitable options to enter/exit the roadway. ▪ The on-road bike lane along the southbound carriageway discontinues north of Ashburton Street and South of Whittlesford Street, and lack suitable options to enter/exit the roadway.	▪ Install off-road bypass paths with smooth transitions at the on-road bike lanes where they discontinue/begin. ▪ Upgrade on-road bike lanes as part of the next resurfacing, ensuring red pavement, adequate pavement markings and signage, and extension across the entire section including through intersections (i.e. Kent Street to Hill View Terrace). ▪ Install wayfinding along route particularly at the Hill View Terrace and Kent Street intersections. This should form part of an overall wayfinding strategy (as outlined in Section 15.3.1).
L6-C	Berwick Street	Hill View Terrace and Boundary Road	**Bicycle Lane (on-road)** Approximately 1.5m on-road bike lanes, which discontinues at some sections. The road is generally 13.5m wide.		▪ This provides part of a north-south connection between the City of Canning and the Victoria Park foreshore. ▪ Existing traffic volumes along the road are approximately 9,000 vehicles per day and the speed limit is 60km/hr. ▪ This road is part of a bus route. ▪ On-road bike lanes are marked with bike symbols, but are not surfaced with red asphalt.	▪ Upgrade on-road bike lanes as part of the next resurfacing, ensuring red pavement, adequate pavement markings and signage, and extension across the entire section including through intersections (i.e. Hill View Terrace Boundary Road). ▪ Install wayfinding along route particularly at the Boundary Road and Hill View Terrace intersections. This should form part of an overall wayfinding strategy (as outlined in Section 15.3.1).

Link Reference	Street Name	Between	Description	Photos	Comments / Issues	Suggestions
					▪ On-road bike lanes lack continuity at the Hill View Terrace and Boundary Road intersections. There is also a lack of suitable options to enter/exit the roadway at these locations where the bike lanes discontinue. ▪ A considerable hill is located along at the Hill View Terrace intersection, increasing effort for cyclists.	
L7	Armagh Street	Berwick Street and Hordern Street	**On-Road (unmarked)** The road currently has no cycling facilities and is generally 6.5m wide. This section is labelled on the DoT Your Move Map as a local bicycle friendly route.	 	▪ This provides an east-west connection between Berwick Street and Albany Highway, and to the Victoria Park foreshore via the Hordern Street underpass. ▪ Traffic volumes are below 1,000 vehicles per day, which is conducive to cycling. ▪ A high number of parked cars were observed along the route, on a single side of the road at each section. As a result, there is insufficient space for cyclists on-road, when a vehicle traveling along the road. ▪ Lighting is lacking along some sections of the path including at locations with heavy foliage (i.e. adjacent to Raphael Park). ▪ The Hordern Street underpass is prone to flooding, due to openings in the roof and drainage issues, due to leaf litter build up Boom gates are located at north end of Hordern Street at the connection to the underpass. ▪ There is a lack of wayfinding along the route.	▪ Develop Armagh Street (between Gloucester Street and Hordern Street) into a Safe Active Street as proposed in the Gloucester Street prioritised project (outlined in Section 15.3). ▪ Regular maintenance of the drainage collection points at the ends of the Hordern Street underpass are required to ensure no blockages. It may also be worth investigating if the roof openings can be covered to avoid water intrusion, without affecting lighting. ▪ Investigate measures to reduce conflict between cyclists and pedestrians at the underpass, and improve its overall amenity. ▪ Investigate the operation of the boom gates at the Hordern Street underpass to ensure they do not block pedestrians and cyclists using the route. ▪ Install wayfinding along the route particularly at Gloucester Street and Hordern Street. This should form part of an overall wayfinding strategy (as outlined in Section 15.3.1).
L8	Gloucester Street	Kent Street and Armagh Street	**On-Road (unmarked)** The road currently has no cycling facilities and is generally 8.0m wide. This section is labelled on the DoT Your Move Map as a local bicycle friendly route.		▪ This provides part of a north-south connection between the City of Canning (via Berwick Street) and the Victoria Park foreshore. This is an alternative route to Berwick Street (between Canning Highway and Kent Street). ▪ Traffic volumes along most of the route are below 1,000 vehicles per day. The section near Kent Street (south east of Star Street) has approximately 2,000 vehicles per day. ▪ The posted speed is 50km/h. ▪ A small section of the route is used by a bus service (between King George Street and McMillan Street).	▪ Develop Gloucester Street into a Safe Active Street as proposed in the Gloucester Street prioritised project (outlined in Section 15.3). ▪ Install wayfinding along the route particularly at Kent Street and Armagh Street. This should form part of an overall wayfinding strategy (as outlined in Section 15.3.1).

Link Reference	Street Name	Between	Description	Photos	Comments / Issues	Suggestions
					▪ There are several intersections along the route without through priority with cyclist having to stop frequently (i.e. Armagh Street, Geddes Street, Cargill Street, McMaster Street, King George Street, McMillan Street, Manchester Street and State Street). ▪ A considerable hill is located along the route, increasing effort for cyclists. ▪ A left-in left out configuration is located at the McMillan Street intersection.	
L9	Albany Highway	Oats Street and the Causeway	**On-Road (unmarked)** The road currently has no cycling facilities and is generally 13.0m wide (4m lanes).	 	▪ Albany Highway (between Oats Street and the Causeway) is a key commercial and entertainment destination for Town of Victoria Park residents and for the wider Perth metropolitan area. ▪ Existing traffic volumes along the road are approximately 15,000 vehicles per day and the speed limit is 40km/hr. ▪ Formalised parking is located along most of both sides of the road, and the carriageways are generally separated by a painted or concrete median. ▪ This is a high frequency bus route, which increases the chances of conflicts at bus stops. ▪ Currently, less confident cyclists will ride on the existing footpath which has multiple conflict points, including pedestrians, service infrastructure and outdoor dining areas (etc). ▪ There is a lack of wayfinding along the route.	▪ Enhance the on-road cycle environment in the short-term, as proposed in the Albany Highway prioritised project (outlined in Section 15.3). ▪ Investigate modifications to parking and the installation of a bi-directional cycle path along the route, as proposed in the Albany Highway prioritised project (outlined in Section 15.3). ▪ Install wayfinding along the route particularly at Hill View Terrace, Mint Street, Kent Street, McMillan Street, Duncan Street and Armagh Street, and indicate key locations such as Victoria Park Train Station. This should form part of an overall wayfinding strategy (as outlined in Section 15.3.1).
L10-A	Rutland Avenue/ Goodwood Parade	Welshpool Road and Great Eastern Highway	**On-Road (unmarked)** The road currently has no cycling facilities and is generally 6.5m north of Victoria Park Station and 10.0m wide south of Victoria Park Station. This road is labelled on the DoT Your Move Map as a local bicycle friendly route.		▪ This provides a principal route along the Perth-Armadale rail line. ▪ Existing traffic volumes are generally below 2,000 vehicles per day, and the speed limit is 50 km/h. ▪ Bus services use some sections of Rutland Avenue, south of Mint Street. ▪ There is a lack of adequate cycle crossing facilities at intersecting roads (i.e. Mint Street and Oats Street), including the lack of median storage and holding rails.	▪ Install high quality shared path along the route between Welshpool Road and Bishopsgate Street and a Safe Active Street between Bishopsgate Street and the Great Eastern Highway as proposed in the Rutland Avenue/ Goodwood Parade prioritised project (as outlined in Section 15.3). ▪ In the interim, improve the transition from on-road to off-road South of the Great Eastern Highway overpass by constructing a more adequate off-road bypass path. ▪ Install wayfinding along the route particularly at Hill View Terrace, Archer Street, Kent Street, Duncan Street and the Great Eastern Highway overpass. This should form

Link Reference	Street Name	Between	Description	Photos	Comments / Issues	Suggestions
					▪ At some locations, surface quality is poor, and there is a build-up of leaf litter. ▪ There is a lack of wayfinding along the route. ▪ The existing off-ramp connection to the path for the Great Eastern Highway overpass is lacking a smooth transition for cyclists.	part of an overall wayfinding strategy (as outlined in Section 15.3.1).
L10-B	Rutland Avenue/ Goodwood Parade	Great Eastern Highway and Riversdale Road	**On-Road (unmarked)** The road currently has no cycling facilities and is generally 10.0m wide. This road is labelled on the DoT Your Move Map as a local bicycle friendly route. A 2.0 to 2.5m asphalt path runs along the west side for approximately 120.0m (from the Great Eastern Highway overpass) to a pedestrian/cyclist rail crossing.		▪ This provides a principal route along the Perth-Armadale rail line. ▪ Existing traffic volumes are generally below 2,000 vehicles per day, and the speed limit is 50 km/h. ▪ The Great Eastern Highway overpass is narrow, increasing potential conflicts for cyclists and pedestrians. ▪ The north side of the overpass is secluded and lacks passive surveillance affecting personal security and making the path unappealing during the evening. However, CCTV is located here for these reasons. ▪ There is a high demand for parking along the west side, and a significant number of trees are present. ▪ Some wayfinding is present, although it shows the outdated Perth Bicycle Network (PBN) routes.	▪ Install a high quality shared path along the route providing a connection to the PSP on the east side of the Graham Farmer Freeway, as proposed in the Rutland Avenue/ Goodwood Parade prioritised project (outlined in Section 15.3). ▪ Consider widening at the Great Eastern Highway overpass as part of future works along this route. ▪ Install wayfinding along the route particularly at the Great Eastern Highway Overpass and Riversdale Road. This should form part of an overall wayfinding strategy (as outlined in Section 15.3.1).
L11-A	Hayman Road	Kent Street and Marquis Street	**Sealed Shoulder (on-road) and Shared Path (off-road)** Approximately 1.5m sealed shoulder, which discontinue at some intersections. A 3.0m off-road path runs along the south side of Hayman Road between Kent Street and Adie Court.	 	▪ This provides connectivity to and between Curtin University, Bentley TAFE Campus, and other nearby destinations. ▪ Existing traffic volumes are approximately 16,000 vehicles per day and the speed limit is 60 km/h. ▪ The on-road bike lanes discontinue at the Curtin University Main Street/Allen Court intersection and at the section between Adie Court and Marquis Street. It is noted that Hayman Road is planned to be upgraded to four lanes for the entire length, which will result in an off-road emphasis for cycling infrastructure. ▪ Curtin University Bus Station is located opposite Jenkins Avenue, which is utilised by several bus services.	▪ Install a 3.0m high quality shared red asphalt path for the missing section of path on the west side (Adie Court south) and associated works as proposed in the Hayman Road prioritised project (outlined in Section 15.3). ▪ Investigate improving crossing priority for cyclists at the Curtin University Main Street/Allen Court intersection as proposed in the Hayman Road prioritised project (outlined in Section 15.3). ▪ Install wayfinding along route particularly at Manning Road, Curtin University Bus Station and Curtin University Main Street. This should form part of an overall wayfinding strategy (as outlined in Section 15.3.1).

Link Reference	Street Name	Between	Description	Photos	Comments / Issues	Suggestions
					▪ The shared path provided is high quality with red pavement, and appropriate pavement and line markings. ▪ There is a gap in the existing high quality shared path south of Adie Court. The existing concrete path lacks width, red pavement surfacing, and pavement markings and signage. ▪ On-road bike lanes are not surfaced with red asphalt, or marked with bike symbols and signage. ▪ No priority is provided for cyclists at crossovers. ▪ There is a lack of wayfinding along the route.	
L11-B	Marquis Street	Hayman Road and Holder Crescent	**Shared Path (off-road)** A 1.8m concrete path runs along the north side of Marquis Street.		▪ This provides connectivity to Curtin University from cycle infrastructure east i.e. Hill View Terrace bike lanes. ▪ Existing traffic volumes are approximately 12,000 vehicles per day, and the speed limit is 60 km/h. ▪ The on-road environment has tight bends and a roundabout which put cyclists in dangerous positions with traffic. ▪ The existing concrete path is narrow and lacks red pavement, and appropriate pavement and line markings. ▪ There is a lack of wayfinding along the route.	▪ Install a 2.5-3.0m high quality shared red asphalt path on the north side of Marquis Street as proposed in the Hayman Road prioritised project (outlined in Section 15.3). ▪ Install wayfinding along route particularly at Hayman Road and Hill View Terrace. This should form part of an overall wayfinding strategy (as outlined in Section 15.3.1).
L12-A	Hill View Terrace	Holder Street and Albany Highway	**Bicycle Lane (on-road)** Approximately 1.5m on-road bike lanes, which discontinues at some sections. The road is generally 13.5m wide, with some sections as narrow as 10.0m.	 	▪ This provides part of a key strategic route that connects multiple key destinations including Curtin University, Albany Highway, TAFE Carlisle, Aqualife and Oats Street Station. ▪ Existing traffic volumes are approximately 13,000 vehicles per day, and the speed limit is 60 km/h. ▪ This is a high frequency bus route with potential conflicts for on-road cyclists at bus stops. ▪ There is a gap in on-road bike lanes between Holder Street and Jarrah Road.	▪ Install new 1.5m wide on-road cycle lanes between Holder Street and Boundary Road as proposed in the Oats Street prioritised project (outlined in Section 15.3) ▪ Upgrade the existing on-road cycle lanes as part of the next resurfacing, ensuring red pavement, adequate pavement markings and signage, and extension of the cycle lanes through intersections (i.e. at Jarrah Road and Albany Highway). ▪ At the Jarrah Road intersection, install advanced cyclist stop boxes on both Hill View Terrace approaches. ▪ At the Holder Street roundabout, install appropriate off-road bypass paths to ensure a smooth transition with the shared path proposed on the north side of Marquis Street and the proposed bike lanes on Hill View Terrace.

Link Reference	Street Name	Between	Description	Photos	Comments / Issues	Suggestions
					▪ On-road Bike lanes discontinue on the east side of Jarrah Road and lack suitable options to enter/exit the roadway. ▪ On-road Bike lanes discontinue on the west side of Albany Highway and lack suitable options to enter/exit the roadway. ▪ On-road bike lanes are marked with bike symbols, but are not surfaced with red asphalt between Jarrah Road and Berwick Street. ▪ A considerable hill is located along the route at the intersection with Berwick Street, increasing effort for cyclists. ▪ There is a lack of wayfinding along the route.	▪ Install wayfinding along the route particularly at Berwick Street and Albany Highway. This should form part of an overall wayfinding strategy (as outlined in Section 15.3.1).
L12-B	Oats Street	Albany Highway and Orrong Road	**Bicycle Lane (on-road)** Approximately 1.5m on-road bike lanes, which discontinues at some sections. The road is generally 13.5m wide.		▪ This provides part of a key strategic route that connects multiple key destinations including Curtin University, Albany Highway, TAFE Carlisle, Aqualife and Oats Street Station. ▪ Existing traffic volumes are approximately 15,000 vehicles per day, and the speed limit is 50 km/h. ▪ This is a high frequency bus route with potential conflicts for cyclists at bus stops. ▪ There is a gap in on-road bike lanes between Albany Highway and Shepperton Road, and at the rail crossing adjacent to Oats Street Station. ▪ On-road bike lanes discontinue on the east side of Shepperton Road and lack suitable options to enter/exit the roadway. ▪ On-road bike lanes discontinue on the west side of Orrong Road and lack suitable options to enter/exit the roadway. ▪ On-road bike lanes are marked with bike symbols, but are not surfaced with red asphalt between Shepperton Road and Orrong Road ▪ There is a lack of off-road bypass paths at the Read Street, Bishopsgate Street and Star Street roundabouts. ▪ There is a lack of wayfinding along the route.	▪ Install 1.5m wide on-road cycle lanes between Albany Highway and Shepperton Road and widen the existing on-road cycle lanes between Shepperton Road and Orrong Road as proposed in the Oats Street prioritised project (outlined in Section 15.3). ▪ Install wayfinding along the route particularly at Albany Highway, Bank Street, Rutland Avenue, and Orrong Road. This should form part of an overall wayfinding strategy (as outlined in Section 15.3.1).

Link Reference	Street Name	Between	Description	Photos	Comments / Issues	Suggestions
L13	Orrong Road	Cornwall Street and Kew Street	**Shared Path (off-road)** A 2.0 to 2.5m wide concrete path runs along the west side of the road. A 1.6 to 2.0m wide concrete path runs along the east side of the road, which is located within City of Belmont ad not referred to further.		▪ This provides north-south route between Leach Highway and Great Eastern Highway. ▪ Existing traffic volumes are approximately 65,000 vehicles per day, and the speed limit is 60 km/h. ▪ A sealed shoulder is provided along sections, although is narrow and lacks continuity. ▪ The existing concrete path lacks appropriate markings and signage, and is narrower at sections than a high quality shared path. ▪ The path pavement surface is cracked and uneven along stretches. ▪ Some sections of the path had debris and overgrown vegetation. ▪ There is a lack of wayfinding along the route.	▪ As part of future works along Orrong Road, ensure that cycle infrastructure is provided. Liaison with Main Roads will be required. ▪ Install wayfinding along the route particularly at Kent Street and Oats Street. This should form part of an overall wayfinding strategy (as outlined in Section 15.3.1).
L14	Jarrah Road	Kent Street and Hill View Terrace	**Bicycle Lane (on-road)** Approximately 1.5m on-road bike lanes.	 	▪ This provides a north-south connection adjacent to Curtin university which provides linkage to key routes and local streets. ▪ Existing traffic volumes are generally below 2,000 vehicles per day, and the speed limit is 50 km/h. ▪ This route is used by bus services, with potential conflicts for on-road cyclists at bus stops. ▪ Most of the on-road bike lanes are appropriately marked and surfaced with red pavement. ▪ The existing on-road bike lanes discontinue at the Kent Street and Hill View Terrace intersections, and lack suitable options to enter/exit the roadway. ▪ Most of the northbound bike lane is located within the door zone of the adjacent and parallel parking, which increases the chances of conflicts for vehicles and cyclists. ▪ Some sections of the bike lanes had debris and vegetation located on it.	▪ Install advanced cyclist stop boxes at the Hill View Terrace intersection at the Jarrah Road and Boundary Road approaches to provide continuous on-road cycle lanes. ▪ During the next resurfacing, consider indenting the on-road parking bays further into the verge to provide sufficient clearance to on-road cyclists away from the door zone of parked vehicles. Alternatively, investigate the installation of a shared path on the western side of Jarrah Road. ▪ Install appropriate off-road bypass paths with smooth transitions at the approach and departure on Jarrah Road at the intersection with Kent Street, as proposed in the Kent Street prioritised project (outlined in Section 15.3). ▪ Investigate indentation of parking along the west side to avoid northbound cyclists being locate in the door zone. ▪ Install wayfinding along the route particularly at Kent Street, and Hill View Terrace. This should form part of an overall wayfinding strategy (as outlined in Section 15.3.1).

Link Reference	Street Name	Between	Description	Photos	Comments / Issues	Suggestions
L15	Baron-Hay Court	Kent Street and George Street	**On-Road (unmarked)** The road currently has no cycling facilities and is generally 6.0m wide. This road is labelled on the DoT Your Move Map as a local bicycle friendly route.		▪ This provides a north-south connection which provides linkage to key routes and continuation to Jarrah Road. ▪ Existing traffic volumes are low along this road. ▪ Parking is located along most of the road on the west side. ▪ This road is in poor condition with uneven pavement and missing kerbing, which has resulted in soil/sand deposits along the road. ▪ It is noted that there is a potential for future development along the road. ▪ Lighting is lacking along the route.	▪ This route is proposed to form part of the long term strategic network as a local route. As part of future works on the road, investigate the provision of a bi-directional cycle path along the eastern side of Baron-Hay Court. In addition, install appropriate off-road bypass paths to ensure a smooth transition between the on -and off-road environments. ▪ Install wayfinding along the route particularly at Kent Street and George Street. This should form part of an overall wayfinding strategy (as outlined in Section 15.3.1).
L16-A	Perth Cycle Ring (Adie Court/ Pallitt Street/ Creaton Street/ Playfield Street/ Devenish Street/ Whittlesford Street)	Hayman Road and Berwick Street	**On-Road (unmarked)** The road currently has no cycling facilities and is generally between 7.5m and 10.0m wide. Adie Court is labelled on the DoT Your Move Map as a local bicycle friendly route.	 	▪ This route forms part of the “Perth Cycle Ring” report and is endorsed by the community. ▪ This provides part of a local east-west route connecting from Curtin University to Oats Street Station. Other attractions and destinations include Millen Primary School, Carson Street School, Aqualife Centre, South Metropolitan TAFE Carlisle Campus. ▪ The route carries predominantly low traffic, and is therefore more suitable for less confident cyclists. ▪ Adie Court is a high frequency bus route, with two cyclist crashes involving buses. The existing path along Adie Court lacks formalised pavement and line marking and conflicts with bus stops and parked vehicles. ▪ Existing signage at the Adie Court/ Jarrah Road intersection indicates that entry is only permitted for taxis and buses. ▪ Parking along Pallitt Street has high usage from Curtin University visitors, which results in a narrow space for on-road traffic and cyclists. ▪ There is lack of controlled parking along Creaton Street. ▪ Millen Primary School is located along Playfield Street, which has increased traffic for the morning and afternoon peaks for children being dropped off. ▪ Lighting is lacking along sections of the route.	▪ Construct a cut-through at the intersection of Adie Court/Jarrah Road to allow cyclists to exit Adie Court and connect to the Jarrah Road on-road cycle lanes. ▪ Update no entry signage at the Adie Court/ Jarrah Road intersection (excluded to buses and taxis) to also allow cyclists to access the road. ▪ This route is proposed to form part of the long term strategic network as a local route. As part of any resurfacing works along the route, consider the implementation of Safe Active Street and high quality shared path treatments.

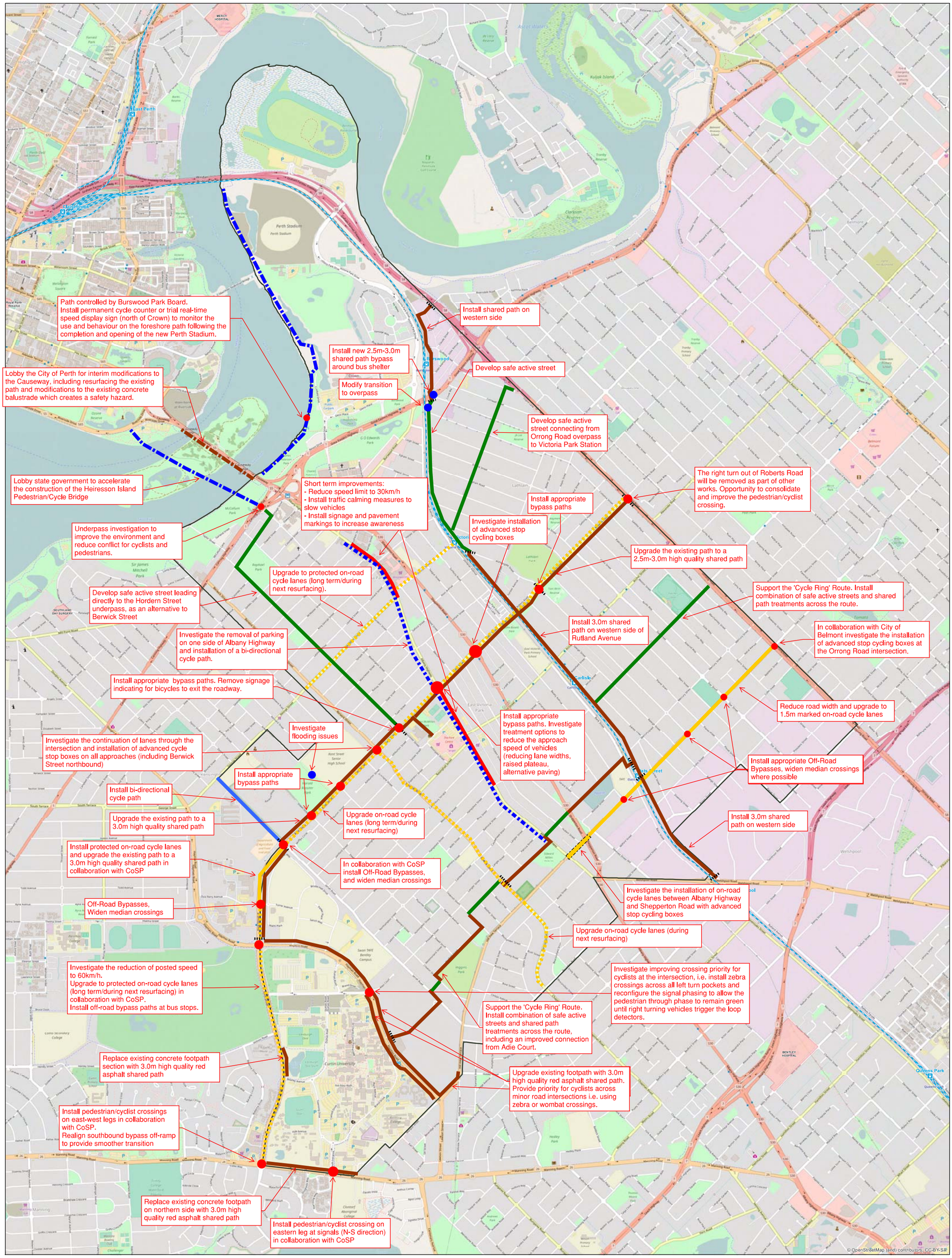
Link Reference	Street Name	Between	Description	Photos	Comments / Issues	Suggestions
L16-B	Perth Cycle Ring (Baillie Avenue/ Somerset Street/ Bank Street)	Berwick Street and Oats Street Station	**On-Road (unmarked)** The road currently has no cycling facilities and is generally between 7.5m and 13.0m wide. Baillie Avenue and Somerset Street are labelled on the DoT Your Move Map as a local bicycle friendly route.		▪ This route forms part of the "Perth Cycle Ring" report and is endorsed by the community ▪ This provides part of a local east-west route connecting from Curtin University to Oats Street Station, made up of a combination of high quality shared paths and safe active streets. Other attractions and destinations include Millen Primary School, Carson Street School, Aqualife Centre, South Metropolitan TAFE Carlisle Campus. ▪ This route carries predominantly low traffic, and is more suitable for less confident cyclists. An off-road environment only is suitable at Berwick Street, which has high traffic volumes. ▪ There is lack of controlled parking along Baillie Avenue. ▪ Provisions for crossing at major roads is lacking holding rails (i.e. Berwick Street, Albany Highway, Shepperton Road) ▪ The section of Somerset Street between Shepperton Road and Bank Street caters for increased traffic volumes (approximately 1,800 vehicles per day), a bus route and connects to the Aqualife Centre and TAFE Carlisle Campus. ▪ Lighting is lacking along sections of the route.	▪ This route is proposed to form part of the long term strategic network as a local route. As part of any resurfacing works, consider the implementation of a high quality shared path on the eastern side of Baillie Avenue adjacent to Edward Millen Reserve. Investigate the feasibility of installing a 2.5m-3.0m high quality shared path between Carson Street School and the National Archives of Australia. ▪ As part of any resurfacing works along the route, consider the implementation of Safe Active Street and high quality shared path treatments.
L17	Lion Street/ Asteroid Way/ Apollo Way/ Solar Way/ Gemini Way/ Galaxy Way	Oats Street Station and Orrong Road	**On-Road (unmarked)** The road currently has no cycling facilities and is generally between 7.5m and 8.5m wide.	 	▪ This provides a local east-west connection between Carlisle Station and Orrong Road. ▪ This route carries predominantly low traffic, and is more suitable for less confident cyclists. ▪ Parking activity is high during events at Fletcher Park and the adjacent Catholic Church along Solar Way. ▪ Lighting is lacking along most of the route. ▪ The general amenity of sections of the route are poor, potentially discouraging use for some cyclists. ▪ Increased permeability for cyclists is provided at several locations along the route, where general traffic has restricted access and cyclists are provided with access.	▪ This route is proposed to form part of the long term strategic network as a local route. As part of any resurfacing works along the route, consider the development of the route as a Safe Active Street.

Link Reference	Street Name	Between	Description	Photos	Comments / Issues	Suggestions
L18	Manning Road	Kent Street and Conlon Street	**Shared Path (off-road)** A 1.6m to 2.0m concrete path runs along the north side of Manning Road. A 2.5m concrete path runs along the south side of Manning Road, which is within CoSP and not referred to here.	 	▪ This provides part of a key strategic east-west route that connects multiple key destinations including Curtin University, South Perth and Canning. ▪ Existing traffic volumes along the road are approximately 32,000 vehicles per day and the speed limit is 70km/hr. This is an unsuitable environment for on-road cycling. ▪ This is a high frequency bus route. ▪ The existing concrete path is narrow and lacks formalised signage, pavement and line marking. ▪ The draft City of Canning Cycling and Walking Plan proposes a 2.5m shared path along Manning Road between Conlon Street and Hamilton Street on one side (assumedly). ▪ There is a lack of adequate crossing facilities along Manning Road to Curtin University.	▪ As part of any resurfacing works along the path, replace the existing footpath with a 2.5m-3.0m wide high quality shared path. ▪ In collaboration with CoSP, upgrade existing crossing facilities at the Curtin University South entrance intersection, as proposed in the Manning Road prioritised project (outlined in Section 7.2).
L19-A	Mint Street	Albany Highway and Rutland Avenue	**On-Road (unmarked)** Most of the road currently has no cycling facilities and is generally between 13.0m and 13.5m wide.		▪ This provides part of an east west connection between Albany Highway and Orrong Road. This section also connects Carlisle Station and the Park Centre shopping complex on Albany Highway. ▪ Existing traffic volumes along the road are approximately 11,000 vehicles per day and the speed limit is 50km/hr. ▪ This road is used by multiple bus services, which creates potential conflicts for on-road cyclists at bus stops. ▪ A sealed shoulder, approximately 1.5m wide is located between Hubert Street and Shepperton Road. This is narrow, not surfaced with red pavement, appropriately signed or marked, which may cause confusion for cyclists wishing to use the facility. ▪ The road is narrowed by a 2.5m painted/ concrete median, which further reduces space for on-road cyclists. ▪ An overpass is located at Shepperton Road, however the grades and width are not conducive to cyclists. There are no other crossing facilities provided at Shepperton Road	▪ This route is proposed to form part of the long term strategic network as a local route. As part of the next resurfacing, investigate the provision of 1.5m on-road bike lanes with consideration of protection, plus advanced stop cycle boxes on the Mint Street approaches of the Albany Highway and Shepperton Road intersections. In addition, green asphalt should be used for the cycle lanes across all side intersections. Where possible, the existing traffic lane width should be narrowed to the minimum possible to facilitate a wider cycle lane. ▪ As part of any upgrades to the rail crossing (i.e. grade separation), investigate the provision of 3.0m high quality shared paths with appropriate off-road bypass paths for each direction, or 1.5m on-road cycle lanes with protection kerb. ▪ With the above infrastructure, install wayfinding along the route particularly at Albany Highway and Shepperton Road. This should form part of an overall wayfinding strategy (as outlined in Section 15.3.1).

Link Reference	Street Name	Between	Description	Photos	Comments / Issues	Suggestions
					for the east-west direction (i.e. pedestrian/cycle lanterns). ▪ A rail crossing is located on the road, which lacks provisions for on-road cyclists.	
L19-B	Archer Street	Rutland Avenue and Orrong Road	**On-Road (unmarked)** Most of the road currently has no cycling facilities and is generally between 12.0 and 15.0m wide.		▪ This provides part of an east west connection between Albany Highway and Orrong Road. This section also provides access to Carlisle Station the Archer Street shops. ▪ Existing traffic volumes along the road are approximately 14,000 vehicles per day and the speed limit is 50km/hr. ▪ This road is used by multiple bus services, which creates potential conflicts for on-road cyclists at bus stops. ▪ Red asphalt pavement and formalised parking is located along the section of road between Raleigh Street and Mars Street, at the local shops. ▪ The road is narrowed by a 1.6m to 1.8m painted/concrete median with tree plantings, which further reduces space for on-road cyclists. ▪ Currently, less confident cyclists will ride on the existing footpath which has multiple conflict points, including pedestrians, service infrastructure and outdoor dining areas (etc).	▪ This route is proposed to form part of the long term strategic network as a local route. As part of the next road resurfacing, investigate the provision of 1.5m on-road cycle lanes with consideration of protection, plus off-road bypass paths on the Archer Street approaches and departures of the Bishopsgate Street, Star Street and Orrong Road intersections. The on-road cycle lanes must provide appropriate clearance from the door zone of the existing on-parking along Archer Street shops. In addition, green asphalt should be used for the cycle lanes across all side intersections. Where possible, the existing traffic lane width should be narrowed to the minimum possible to facilitate a wider cycle lane. ▪ With the above infrastructure, install wayfinding along the route particularly at Bishopsgate Street and Archer Street shops. This should form part of an overall wayfinding strategy (as outlined in Section 15.3.1).
L20-A	McMillan Street	Berwick Street and Albany Highway	**On-Road (unmarked)** Most of the road currently has no cycling facilities and is generally 10.0m wide.		▪ This provides an east west connection between George Street and Albany Highway, which provides access to South Perth and the Albany Highway commercial precinct. ▪ Existing traffic volumes along the road are approximately 6,000 vehicles per day and the speed limit is 50km/hr. ▪ This road is used by a bus service for the section between Berwick Street and Gloucester Street. ▪ Several median crossings are located along the road for cyclists and pedestrians.	▪ This route is proposed to form part of the long term strategic network as a local route. As part of the next road resurfacing, investigate the provision of 1.5m on-road cycle lanes with consideration of protection, plus advanced stop cycle boxes on the McMillan Street approaches of the Berwick Street and Albany Highway intersections. In addition, green asphalt should be used for the cycle lanes across all side intersections. Where possible, the existing traffic lane width should be narrowed to the minimum possible to facilitate a wider cycle lane. ▪ With the above infrastructure, install wayfinding along the route particularly at Gloucester Street and Albany Highway. This should form part of an overall wayfinding strategy (as outlined in Section 15.3.1).

Link Reference	Street Name	Between	Description	Photos	Comments / Issues	Suggestions
L20-B	Duncan Street	Albany Highway and Victoria Park Station	**On-Road (unmarked)** Most of the road currently has no cycling facilities and is generally between 10.0 to 12.0m wide.		▪ This provides an east west connection between Albany Highway and Victoria Park Station. ▪ Existing traffic volumes along the road are approximately 4,000 vehicles per day and the speed limit is 50km/hr. ▪ Formalised parking is located along the section between Albany Highway and Shepperton Road. ▪ There is a lack of pedestrian/cycle lanterns at the Shepperton Road signalised intersection.	▪ This route is proposed to form part of the long term strategic network as a local route. As part of the next resurfacing, investigate the provision of 1.5m on-road cycle lanes with consideration of protection, plus advanced stop cycle boxes on the Duncan Street approaches of the Albany Highway and Shepperton Road intersections. In addition, green asphalt should be used for the cycle lanes across all side intersections. Where possible, the existing traffic lane width should be narrowed to the minimum possible to facilitate a wider cycle lane. Investigation into a wombat crossing to provide improved access from Kitchener Avenue to Victoria Park Station is also recommended. ▪ With the above infrastructure, install wayfinding along the route particularly at Albany Highway and Victoria Park Station. This should form part of an overall wayfinding strategy (as outlined in Section 15.3.1).

Link				Convenience			Accessibility / Safety				Comfort				Attractiveness				
Number	Name	Description	Location (between)	Continuity	Legibility	Directness	Worst Junction Conflict Point	Traffic Volume	Traffic Proximity / Mix	Traffic Speed	Link Conflict Points	Effective Width	Surface Quality	Maintenance	Overall Effort	Personal Security	Lighting	Quality of Environment	Overall Score
L1	Town of Victoria Park Foreshore Path	Separated Path/Shared Path	Ellam Street and Windan Bridge	2	0	2	0	3	3	N/A	2	3	2	2	2	2	0	2	25
L2	Great Eastern Highway	Shared Path	Burswood Park and Great Eastern Highway Overpass	2	0	2	0	3	3	N/A	0	2	2	2	2	1	2	2	23
L3	Gallipoli Street	Shared Path	Orrong Road Overpass and Rutland Avenue	1	1	2	-1	1	1	0	0	3	0	0	0	0	0	2	10
L4	Bishopsgate Street	Bicycle Lane	Rutland Avenue and Archer Street	-1	0	1	-2	0	2	0	-1	0	2	0	2	2	1	1	7
L5	Ken Street/Miller Street/Roberts Road	Shared Path/Bicycle Lane	Manning Road and Orrong Road	0	0	2	-3	-3	2	-3	0	0	2	0	2	1	0	0	0
L6	Berwick Street	Sealed Shoulders	Canning Highway and Kent Street	-2	-2	2	1	-3	-2	-3	-2	0	0	0	-1	1	1	0	-10
L7	Armagh Street	On-Road	Berwick Street and Hordern Street	2	-2	2	0	3	-1	0	1	-2	2	2	2	2	1	2	14
L8	Gloucester Street	On-Road	Kent Street and Armagh Street	0	-2	2	-2	2	0	0	1	-1	1	1	-1	2	2	1	6
L9	Albany Highway	On-Road	Oats Street and the Causeway	-1	0	2	-2	-3	-2	0	-2	-1	2	2	2	2	2	2	3
L10	Rutland Avenue	On-Road	Welshpool Road and Great Eastern Highway	-1	-2	2	-1	2	0	0	1	1	0	1	2	0	0	2	7
L11	Hayman Road	Shared Path/Bicycle Lane	Hayman Road and Holder Crescent	-1	0	2	-2	-3	-2	-3	-2	0	1	2	2	2	1	2	-1
L12	Hill View Terrace/ Oats Street	Bicycle Lane	Holder Street and Orrong Road	-1	1	2	-2	-3	2	-3	-1	1	0	-1	0	1	0	1	-3
L13	Orrong Road	Shared Path	Cornwall Street and Kew Street	1	0	2	0	-3	3	-3	2	2	-1	-1	2	1	2	0	7
L14	Jarrah Road	Bicycle Lane	Kent Street and Hill View Terrace	1	1	2	-2	2	2	0	-1	0	1	-1	0	1	1	1	8
L15	Baron-Hay Court	On-Road	Kent Street and George Street	2	-1	2	0	3	0	0	1	-2	-1	-1	-1	0	-2	1	1
L16	Perth Cycle Ring	On-Road	Hayman Road and Oats Street Station	0	-1	0	0	2	-2	0	0	-2	1	1	0	1	0	1	1
L17	Lion Street	On-Road	Oats Street Station and Orrong Road	1	-1	2	0	3	0	0	1	-1	0	-1	2	-1	-2	-1	2
L18	Manning Road	Shared Path	Kent Street and Conlon Street	1	0	2	0	-3	3	3	0	0	-1	-1	2	1	0	1	8
L19	Mint Street/ Archer Street	On-Road	Albany Highway and Orrong Road	0	0	2	-2	-3	-2	0	0	0	1	1	2	2	1	0	2
L20	McMillan Street/ Duncan Street	On-Road	Berwick Street and Duncan Street	0	0	2	1	0	-1	0	0	0	1	1	1	2	2	1	10



Legend

- Rail Stop
- Railway
- LGA Boundary (ToVP)
- Hospital Facility
- Separated Path (Bikes Only)
- High Quality Shared Path (Bikes and Pedestrians)
- On-Road Bicycle Lanes or Sealed Shoulders
- Safe Active Street/Shared Space
- Identified issue requiring further investigation
- Identified issue requiring minor works

A1 scale: 1:12,000
0 280 560 m

Source: © Landgate 2017, ESRI World Imagery

Date: 9/08/2017

PERTH

aurecon

DRAFT

Coordinate System: GDA 1994 MGA Zone 50
File: f0003_255909_A1P_Overview_DraftToVP_RevB
GIS Analyst: Sophie.Richards

Infrastructure Audit Summary (ToVP)

Appendix F – Infrastructure Project Sheets (ToVP)

1 Rutland Avenue Project

Objective	Sub Objective	Qualitative Impacts	Quantitative Assessment		Weighting	Weighted /10
			No. of Comments	Score / 10		
Public Consultation	Community Survey	There is a very high demand for provisions of cycle infrastructure along this route. A high number of issues and safety concerns were raised along the route including high traffic speeds, high traffic volumes and lack of facilities for cyclists.	26-50	**8.0**	**20%**	**8.83**
	Stakeholders	The lack of cycle infrastructure along the rail line was discussed, which this Plan must support.				
			Score / 10	**Average / 10**		
Strategic	Completion of State Networks	This project forms part of the principal route along the rail line that acts a key connection for the region.	10	**10.0**	**25%**	
Connectivity	Schools	This project provides a connection to East Victoria Park Primary School.	6	**7.6**	**25%**	
	Tertiary	This project may increase cyclist connectivity, but connectivity to specific tertiary institutions will be limited.	2			
	Recreational and Tourism	This project is a major recreational route and provides direct access to a number of destinations including Burswood Precinct, Perth, Lathlain Precinct and Albany Highway.	10			
	Employment Zones	This project provides direct and convenient access to the Perth CBD and will assist commuters.	10			
	Public Transport	This project provides direct access to Welshpool Station, Oats Street Station, Carlisle Station and Victoria Park Station.	10			
Economic	Mode Shift	It is likely that this project could attract all cyclist groups to access Perth and key destinations within ToVP (i.e. Albany Highway).	10	**6.7**	**5%**	
	Impact on motor vehicles	Because of the separation to vehicles, this will not effect general traffic.	0			
	Economic Impacts	This project provides a connection to Albany Highway, Burswood and Perth.	10			
Safety	Cycling Safety	Providing appropriate facilities segregated from general traffic presents significant increases in safety for regular users.	10	**10.0**	**15%**	
	Pedestrian safety issues	The issues associated with conflict between pedestrians and cyclists will not increase because this project does not require the removal of the existing footpath on the east side.	10			
People and Communities	Level of Service	This project will reduce delay across the route, caused by vehicle interactions.	10	**10.0**	**10%**	
	Townscape/Urban Planning	This project aligns with planning to increase activity at Burswood Peninsula.	10			
Financial	Possible funding source	ToVP Capital Works Programme / Department of Transport				
			Amount			
	Estimated Capital Cost	Estimated cost over four stages of works	$2,300,000.00			

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2 Kent Street Project

Objective	Sub Objective	Qualitative Impacts	Quantitative Assessment		Weighting	Weighted /10
			No. of Comments	Score / 10		
Public Consultation	Community Survey	From the online Mapping Tool, this route received the highest number of comments for cycling issues and safety concerns. Issues raised include the discontinuity of cycle lanes at sections of road and major intersections. Off-road facilities are also missing along sections or of low quality. The directness of the route and high level of community input highlights a clear desire for this project.	26-50	**8.0**	**20%**	**8.07**
	Stakeholders	A number of issues with intersections at major roads were raised, in addition to the missing gaps between Curtin University and the rest of Victoria Park.				
			Score / 10	**Average / 10**		
Strategic	Completion of State Networks	This forms a strategic route acting as a key east-west connection through Victoria Park and neighbouring Councils.	8	**8.0**	**25%**	
Connectivity	Schools	This project provides direct access to Kent Senior High School and East Victoria Park Primary School.	10	**8.2**	**25%**	
	Tertiary	This project provides direct access to Curtin University.	10			
	Recreational and Tourism	This project connects to a number of key destinations within ToVP including Curtin University facilities, Harold Rossiter Park, Albany Highway shops and Lathlain Park.	8			
	Employment Zones	This project provides improved connections to Curtin University and the Albany Highway commercial precinct.	8			
	Public Transport	This project will have some benefit in terms of connecting to public transport , as it improves the connection to the Rutland Avenue PSP and Victoria Park Station.	5			
Economic	Mode Shift	It is likely that this project could attract both non-confident and confident cyclists to Curtin University, and to attractors internal to ToVP (i.e. Albany Highway shops).	8	**5.3**	**5%**	
	Impact on motor vehicles	Reduction of speed limit between Manning Road and Jarrah Road and advanced cyclist stop boxes at signalised intersections will increase journey times for general traffic. A reduction in lane width and traffic calming measures may also reduce the level of service of motor vehicles.	-2			
	Economic Impacts	This project provides direct access to Waterford Plaza shopping centre and Albany Highway.	10			
Safety	Cycling Safety	Providing appropriate off-road facilities segregated from general traffic presents significant increases in safety for regular users. Off-road bypasses for on-road facilities and painted buffer zones will significantly increase safety for on-road cyclists.	10	**9.0**	**15%**	
	Pedestrian safety issues	Shared paths provide a higher probability of conflict between pedestrians and cyclists compared to other facilities.	8			
People and Communities	Level of Service	This project will improve comfort (smoother surface) and reduce delays at busy sections.	8	**8.0**	**10%**	
	Townscape/Urban Planning	This project aligns with planning to increase connectivity to Curtin University, and Albany Highway.	8			
Financial	Possible funding source	ToVP Capital Works Programme / City of South Perth / Department of Transport				
			Amount			
	Estimated Capital Cost	Estimated cost over four stages of works to provide a complete shared path connection between Manning Road and Orrong Road.	$1,500,000.00			

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3 Albany Highway Investigation

Objective	Sub Objective	Qualitative Impacts	Quantitative Assessment		Weighting	Weighted /10
			No. of Comments	Score / 10		
Public Consultation	Community Survey	From the community survey, this route received the highest number of comments with regards to cycling issues and safety concerns. The lack of cycle infrastructure, lack of driver awareness and speeding drivers creates an intimidating environment for cyclists.	26-50	**8.0**	**20%**	**7.67**
	Stakeholders	Discussions were raised for the lack of cycle infrastructure along the route, and issues for providing this while maintaining on-street parking. The appropriate type of cross section along this route was a source of contention amongst stakeholders, considering the potential future planning within the area.				
			Score / 10	**Average / 10**		
Strategic	Completion of State Networks	This project forms a local route which provides a connection through the centre of ToVP and connects to strategic routes.	6	**6.0**	**25%**	
Connectivity	Schools	This project provides direct access to Victoria Park Primary School and connects with Ursula Frayne Secondary College.	10	**7.2**	**25%**	
	Tertiary	This project may increase cyclist connectivity, but connectivity to specific tertiary institutions will be limited.	2			
	Recreational and Tourism	This project is part of the Albany Highway commercial strip, which is a recreational destination.	10			
	Employment Zones	This project will provide improved access for commuters accessing the Albany Highway commercial precinct.	10			
	Public Transport	This project will have some benefit in terms of connecting to public transport, as it improves the connection to Victoria Park Station.	4			
Economic	Mode Shift	It is very likely that this project could attract non-confident cyclists to visit Albany Highway by bike.	10	**5.3**	**5%**	
	Impact on motor vehicles	Further reduction of the speed limit and traffic calming will increase journey times for general traffic.	-4			
	Economic Impacts	This project is part of the Albany Highway commercial strip.	10			
Safety	Cycling Safety	Removing pinch points, increasing driver awareness and reducing traffic speeds will significantly improve cyclist safety. Medium-term treatments for segregation will further reduce potential conflict points.	10	**10.0**	**15%**	
	Pedestrian safety issues	Existing footpaths remain providing segregation from all other modes.	10			
People and Communities	Level of Service	The project will improve comfort and reduce delay because of improved priority along the road.	10	**10.0**	**10%**	
	Townscape/Urban Planning	The project supports urban planning for Albany Highway.	10			
Financial	Possible funding source	ToVP Capital Works Programme				
			Amount			
	Estimated Capital Cost	Investigation into bi-directional cycle lanes on one side of Albany Highway, plus interim low cost measures to improve cycling awareness.	$100,000.00			

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4 Gloucester Street Project

Objective	Sub Objective	Qualitative Impacts	Quantitative Assessment		Weighting	Weighted /10
			No. of Comments	Score / 10		
Public Consultation	Community Survey	There is demand for improved infrastructure connecting to the Swan River Foreshore. Berwick Street was raised during the survey as an area requiring improvement, which this project provides an alternative option.	6-15	4.0	20%	7.10
	Stakeholders	This project provides an alternative route to Berwick Street, which was raised as an area of significant concern for cyclists.				
			Score / 10	Average / 10		
Strategic	Completion of State Networks	This project forms a strategic route acting as a key north-south connection through Victoria Park to Perth.	8	8.0	25%	
Connectivity	Schools	This project provides a connection to Kent Street High School and Victoria Park Primary.	10	6.0	25%	
	Tertiary	No tertiary institutions are within close proximity to the project although it still could form part of the route to Bentley.	4			
	Recreational and Tourism	This project could be utilised to connect to key destinations along the foreshore such as Taylor McCallum Park. Connection to recreational uses on Albany Highway and at Curtin University (as it develops into activity centre) are also connected.	8			
	Employment Zones	This project provides improved connection for non-confident commuters to the Perth CBD.	8			
	Public Transport	The project does not connect to any major bus or train stations	0			
Economic	Mode Shift	It is likely that this project could attract non-confident cyclists to access Perth and Albany Highway.	10	6.0	5%	
	Impact on motor vehicles	The project would decrease the posted speed and remove priority from vehicles, increasing journey times.	-2			
	Economic Impacts	The project directly connects to The Park Shopping Centre.	10			
Safety	Cycling Safety	Removing pinch points, increasing driver awareness and reducing traffic speeds will significantly improve cyclist safety.	10	10.0	15%	
	Pedestrian safety issues	Existing footpaths remain providing segregation from all other modes.	10			
People and Communities	Level of Service	The project will improve comfort (if road is resurfaced) and reduce delay because of improved priority at intersections.	10	10.0	10%	
	Townscape/Urban Planning	The project supports urban planning for the Victoria Park area.	10			
Financial	Possible funding source	ToVP Capital Works Programme / Department of Transport				
			Amount			
	Estimated Capital Cost	Estimated cost based on recently completed Safe Active Street projects.	$1,300,000.00			

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5 Oats Street Project

Objective	Sub Objective	Qualitative Impacts	Quantitative Assessment		Weighting	Weighted /10
			No. of Comments	Score / 10		
Public Consultation	Community Survey	There is demand for improved infrastructure along the entire length of Hill View Terrace and Oats Street, particularly where bicycle lanes end between Albany Highway and Shepperton Road.	6-15	4.0	20%	6.85
	Stakeholders	The abovementioned gap was also highlighted by stakeholders.				
			Score / 10	Average / 10		
Strategic	Completion of State Networks	This forms part of a strategic route acting as a key connection through to Belmont.	8	8.0	25%	
Connectivity	Schools	This project may increase cyclist connectivity, but connectivity to specific schools will be limited.	2	7.4	25%	
	Tertiary	This project provides direct access with the TAFE campus in Carlisle.	10			
	Recreational and Tourism	This project could be utilised for Aqualife and a number of parks.	8			
	Employment Zones	This project provides improved access for commuters accessing Curtin University, the Albany Highway commercial precinct and within the City of Belmont.	7			
	Public Transport	This project provides a direct connection from the east and west to Oats Street Station.	10			
Economic	Mode Shift	It is likely that this project could attract confident cyclists to access Curtin University and public transport.	8	4.0	5%	
	Impact on motor vehicles	This project may involve a reduction in lane width and traffic calming measures that may reduce the level of service of motor vehicles.	-2			
	Economic Impacts	This project connects to Albany Highway and forms part of the connection to Belmont Forum.	6			
Safety	Cycling Safety	Off-road bypasses for on-road facilities and painted buffers will significantly increase safety for on-road cyclists.	8	8.0	15%	
	Pedestrian safety issues	Existing footpaths remain providing segregation from all other modes.	8			
People and Communities	Level of Service	This project will improve comfort (smoother surface) and reduce delay at intersections.	8	8.0	10%	
	Townscape/Urban Planning	This project aligns with planning to increase connectivity to Albany Highway and Bentley.	8			
Financial	Possible funding source	ToVP Capital Works Programme / Department of Transport				
			Amount			
	Estimated Capital Cost	Estimated cost to install new on-road cycle lanes and widen existing on-road cycle lanes to provide a complete cycle connection between Holder Street and Orrong Road.	$1,000,000.00			

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6 Hayman Road Project

Objective	Sub Objective	Qualitative Impacts	Quantitative Assessment		Weighting	Weighted /10
			No. of Comments	Score / 10		
Public Consultation	Community Survey	There is demand for improved infrastructure along Hayman Road, due to the existing gap in off-road facilities causing inconvenience and safety concern.	6-15	**4.0**	**20%**	**6.53**
	Stakeholders	Curtin University raised the lack of cycle infrastructure along Hayman Road, to improve connectivity into the campus form the east side.				
			Score / 10	**Average / 10**		
Strategic	Completion of State Networks	This forms a strategic route acting as a key connection through to the Swan River Foreshore (via Douglas Avenue) and Kent Street.	8	**8.0**	**25%**	
Connectivity	Schools	This project may increase cyclist connectivity, but connectivity to specific schools will be limited.	2	**5.4**	**25%**	
	Tertiary	This project provides direct access with Curtin University (including Technology Park) and the TAFE.	10			
	Recreational and Tourism	This project will improve connectivity to sporting facilities at Curtin University.	4			
	Employment Zones	This project provides improved access to Curtin University for staff.	6			
	Public Transport	This project provides direct access to the Curtin University Bus Station, although a new station is planned internal to the campus	5			
Economic	Mode Shift	It is likely that this project could attract non-confident cyclists to Curtin University, removing a barrier to the final part of the journey.	8	**2.7**	**5%**	
	Impact on motor vehicles	Improvement of signal phasing for pedestrians and cyclists, and zebra crossings on side roads will increase delay for vehicles	-2			
	Economic Impacts	This project will not provide direct access to any shopping centres, but may have some positive effects to Curtin University stores.	2			
Safety	Cycling Safety	Providing appropriate facilities segregated from general traffic presents significant increases in safety for regular users.	10	**9.0**	**15%**	
	Pedestrian safety issues	Shared paths provide a higher probability of conflict between pedestrians and cyclists compared to other facilities.	8			
People and Communities	Level of Service	This project will improve comfort (smoother surface) and reduce delay because of zebra crossings at cross roads, and improved crossing phases at the Allen Court/Curtin Main Street intersection	10	**9.0**	**10%**	
	Townscape/Urban Planning	The project aligns with increasing connectivity to Curtin University, which is designated as a specialised activity centre.	8			
Financial	Possible funding source	ToVP Capital Works Programme / Department of Transport				
			Amount			
	Estimated Capital Cost	Estimated cost to install new 3.0m shared path to provide a complete shared path connection between Adie Court and Holder Street.	$450,000.00			

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Western Australian Planning Commission Draft Liveable Neighbourhoods 2015

Bringing ideas to life

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