



Department of
Transport

Western Australian Bicycle Network Plan 2017 update





MINISTER'S FOREWORD

As a mother of three young children, I know how enjoyable cycling can be for Western Australian families.

The number of Perth people cycling to work, or for fun, has significantly increased in popularity over the past 15 years and we want to continue this trend so the community can reap the environmental, social and health benefits offered by choosing their bikes.

Perth has a good level of existing cycling infrastructure but there are still a lot of gaps and dead ends. We know that people want to ride their bikes, but want to do so safely with dedicated facilities.

The McGowan Labor Government reinforced its commitment to improving the State's cycling network by allocating a total of \$129 million over the next four years to deliver safe and connected transport options for Western Australians.

This unprecedented investment will ensure the delivery of projects that will provide an integrated network of safe, high-quality paths helping to ensure that everyone is able to ride safely while easing congestion.



The 2017 updates to the *Western Australian Bicycle Network (WABN) Plan* will guide the continued delivery of cycling infrastructure to better meet the growing need for convenient, safe cycling routes and end-of-trip facilities, while aligning with our METRONET and planning priorities.

Cycling infrastructure needs to be considered an important part of all major transport projects, so with every new major road or METRONET railway constructed by this Government, you will likely find new cycling facilities.

For the Perth area, the focus will continue on filling gaps and expanding on the current cycling and pedestrian network with priority placed within a 15 kilometre radius from the Perth CBD along railway lines and major roads.

For regional WA, the focus is on completing a number of bike network plans that will guide the delivery of strategic cycling infrastructure and help to provide opportunities for greater recreational activity. The plans will include short-term actions which will be used to guide future funding through the Regional Bicycle Network Grants Program.

A number of new initiatives including the Safe Active Streets Program and bike boulevard projects have been included in the update to encourage short trips on bikes to schools, railway stations or shops. The Program is designed to create safe and comfortable riding environments for bike riders with all levels of experience.

The WABN Plan has been a catalyst for significant funding in cycling infrastructure and renewed interest in cycling across the State, local government and cycling groups. This update will ensure that the strategic expansion of the cycling network will coincide with our expansion of METRONET as part of a multifaceted approach to reducing congestion and increasing liveability in our suburbs.

Hon Rita Saffioti MLA

Minister for Transport

EXECUTIVE SUMMARY

The vision of the *Western Australian Bicycle Network Plan 2014-2031 (WABN Plan)* is to make Western Australia (WA) a place where cycling is safe, connected, convenient and a widely-accepted form of transport.

Numerous benefits for individuals and communities are realised when cycling participation increases, including improved physical and mental health, reduced levels of road congestion and reduced air and noise pollution. If the number of cyclists is to increase in the future, the emphasis must be on providing high-quality, safe and comfortable cycling infrastructure.

The WABN Plan has been developed to leave a lasting legacy for all current and future cyclists. It includes initiatives which cover a range of activities to efficiently provide a safe and sustainable cycling network which ties in with key activity and attraction areas.

The purpose of the WABN Plan 2017 Update is to report on progress towards the key actions and ensure the Plan remains relevant and reflective of current planning practices and government priorities. A detailed revision of the Plan is due in 2019.

The WABN Plan has been a catalyst for significant funding in cycling infrastructure and renewed interest in cycling across the State, local government and cycling groups. Continued investment is vital to encourage and grow cycling as well as shape active and healthy communities.

Agencies across government have played a key role in developing, supporting and delivering on the WABN Plan initiatives.

KEY ACHIEVEMENTS

Since the release of the WABN Plan in 2014, significant progress has been made on a number of key initiatives relating to cycling.

Safe Active Streets Program (bike boulevards)

In March 2015, the Department of Transport (DoT) together with the RAC, hosted a Cycling Imagineering Workshop and Ministerial Roundtable Dinner with stakeholders and two visiting Dutch transport planners. The aim was to explore innovative options to provide a safe and connected cycling network for people of all ages in Perth and regional towns.

A key outcome of the workshop and roundtable dinner was the State Government commitment to a demonstration Safe Active Streets Program.

A [report](#) from the workshop including agreed key actions to improve cycling in WA is available on the DoT website.

The development of the Safe Active Streets Program forms a new key action within the WABN Plan and has been an area of focus with bike boulevard demonstration projects developed in partnership with the Cities of Bayswater, Vincent and Belmont.

Bike boulevards are cycle routes on quiet local streets, where speeds have been reduced to 30 km/h to allow people in cars and on bikes to share the street safely. With lower traffic speeds, streets are also much safer for pedestrians and children, and additional tree planting and landscaping make them more attractive places to walk or ride.

The demonstration projects were approved for implementation in April 2016. Construction commenced in late June with the Shakespeare Street Bike Boulevard officially opened at a community event on 4 December 2016. Planning and design for stage two of Shakespeare Street is currently underway.

Stage one of the Bayswater to Morley Bike Boulevard was completed in June 2017. Construction of the Surrey Road Safe Active Street in Belmont has also commenced. In addition to the pilot projects, another five local authorities received funding for the planning and design of safe active street projects in 2016-17.

Principal Shared Path (PSP) Program

Since the release of the WABN Plan in 2014, a number of PSP projects have been completed. In 2014-15, 7 km of PSP was built at a cost of \$10.6 million; in 2015-16, 14.7 km of PSP was built for \$23.8 million; and in 2016-17, 9 km of PSP was built at a cost of \$29.5 million.

The completed projects include :

- Fremantle Line – Shenton Park to Loch Street
- Kwinana Freeway – Scandrett Way to London Way
- Kwinana Freeway – Mill Point Road to Thelma Street
- Mitchell Freeway – Erindale Road to Balcatta Road
- Midland Line – Bassendean Station to Lord Street
- Midland Line – Guildford Bridge/Railway Parade

- Midland Line – Lord Street underpass
- Midland Line – Guildford Station to East Street
- Midland Line – East Street to Morrison Road

As part of the Malaga Drive interchange upgrade and Gateway WA project around Perth Airport, new PSP connections have also been delivered along the Reid, Leach, Roe and Tonkin Highways.

Local Government Grants Program

The Perth Bicycle Network (PBN) and Regional Bicycle Network (RBN) Grants Programs are the mechanism State Government uses to support local governments to plan, design and build cycling infrastructure.

Over the past three years:

- 40 PBN projects have been funded and delivered;
- 57 RBN projects have been funded and delivered; and
- 9 Connections to School projects have been funded and delivered.

A number of improvements have been made to the program including the introduction of a two-stage application process, milestone setting, funding projects over two to three years to allow for concept planning and design before construction, and prioritisation of projects with greater strategic significance.

Review of local bicycle routes

In 2016-17 a review was conducted of local bicycle routes to assist with the development and creation of the Western Australian Cycling Network Hierarchy. This is a modern classification system that determines the function of the route based on the types of activities that take place along the corridors.

Review of Traffic Management of Local Roads

Main Roads has developed the draft [Cycling Guidelines for Local Area Traffic Management](#) which aim to improve outcomes for cyclists when practitioners are designing and implementing local area traffic management schemes in Western Australia. The Guidelines are primarily focused on local and access type roads and consider best practice examples from around Australia and overseas. Draft guidelines were released for public consultation in 2017, updates to the draft are required before further consultation will be undertaken. The Department will facilitate the necessary updates and additional consultation in order to finalise the guidelines in the 2018-19 financial year.

Planning for cycling in the regions

The Department has commenced work with Local Governments in Geraldton, Greater Bunbury, Busselton, Margaret River and Nannup to develop long-term strategic bicycle plans. This work considers cycling connectivity within town centres as well as between regions, for the purpose of transport and tourism into the future.

Larger centres such as Bunbury, Busselton and Geraldton are more likely to include high standard principal routes than smaller regional towns. For all centres, a combination of strategic and local routes will be identified. The plans will also consider long distance cycle trails and on road training circuits which are important for facilitating inter-regional connectivity, safer long distance riding and growth in cycle tourism.

The plans will include short-term prioritisation plans which will be used to guide future funding through the RBN Grants Program for dedicated cycling infrastructure.

Monitoring and usage

DoT has completed a bicycle network counting and monitoring strategy. The strategy recommends prospective sites for the installation of bicycle counters, both on existing and proposed on-road and off-road paths. The installation of counters will continue in the coming years.





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VISION, TARGET AND OBJECTIVES

Vision

The vision of the *Western Australian Bicycle Network Plan 2014-2031* (WABN Plan) is to make Western Australia (WA) a place where cycling is safe, connected, convenient and a widely-accepted form of transport.

Target

To achieve increased levels of cycling, improve cycling infrastructure and reduce serious cyclist injuries.

Objectives

The objectives of the WABN Plan take a whole-of-government approach to cycling.

The objectives are to:

1. Build evidence and demonstrate the benefits of cycling for the community;
2. Encourage cycling to build active and healthy communities;
3. Provide a high-quality, interconnected bicycle network;
4. Improve the level of safety for people cycling; and
5. Build and enhance relationships with advocacy groups and relevant stakeholders.

“The vision is to make WA a place where cycling is safe, connected, convenient and a widely accepted form of transport.”

BACKGROUND

CYCLING DEMANDS AND TRENDS

General cycling participation

Since the release of the *National Cycling Strategy 2011-2016*, annual analysis of cycling participation rates across the country has occurred. The latest 2017 figures identify that in WA:

- the cycling participation rate is 42 per cent which is significantly higher than the Australian average of 34 per cent;
- males are more likely to have cycled in the past week than females;
- 85 per cent of people who regularly cycle do so for recreation; and
- 35 per cent of people who regularly cycle use a bicycle for transport.

The *RAC 2015 Cycling Survey* found that in WA, 82 per cent of people cycle for exercise and 40 per cent cycle for transport. The majority of these people are cycling on shared paths and then on-road.

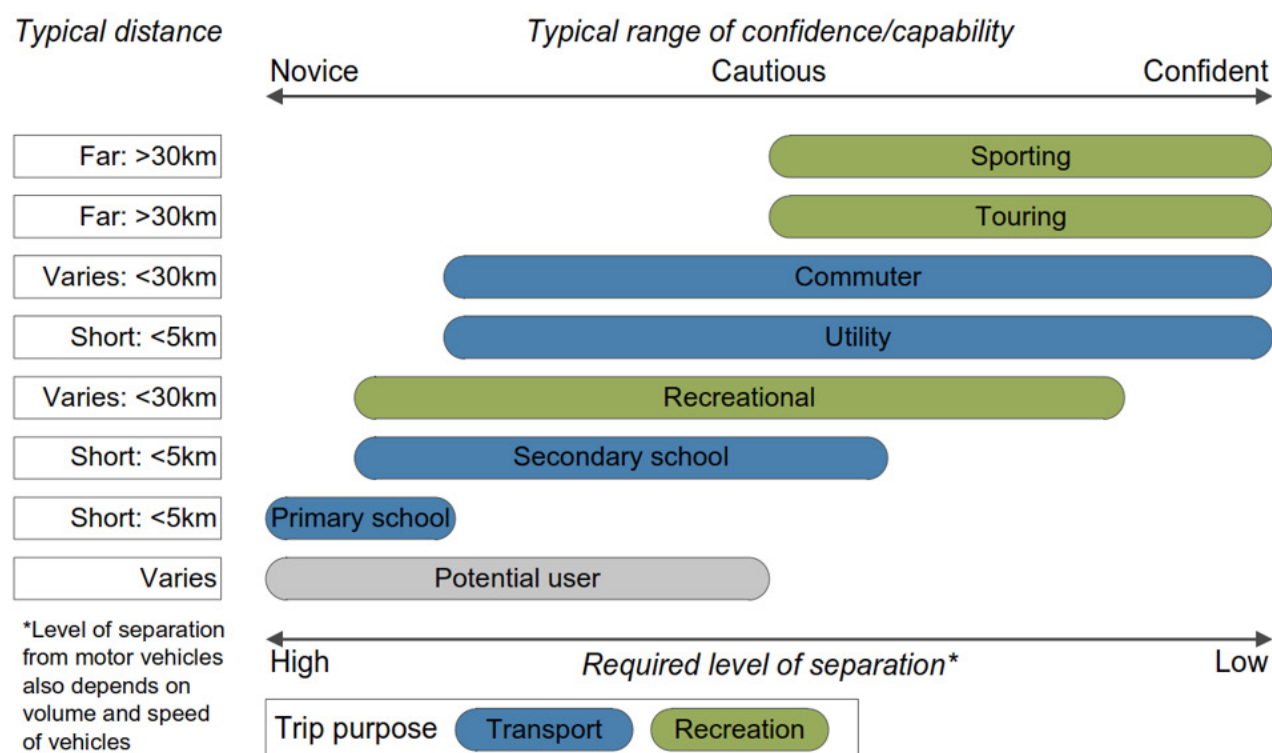
These figures confirm that people cycle for different reasons and purposes and the WABN needs to cater for a segmented cycling market across:

- transport;
- sport;
- recreation; and
- tourism.

Each group has different needs and demands that can require tailored infrastructure solutions. These solutions are dependent on the groups' level of confidence when riding (Figure 1). At the same time, cycling infrastructure is likely to be used by a variety of user groups and we need to ensure that it adequately caters for their differing needs, demands and levels of confidence.

The Department of Transport (DoT) will continue to work with stakeholders such as the Department of Local Government, Sport and Cultural Industries, WestCycle and Tourism Western Australia, to strive to meet the needs of all cyclists in WA.

Figure 1. Types of cyclists, their confidence level and required level of separation



Source: [Austroads](#) Guide to Traffic Management Part 4: Network Management

Cycling into the Central Business District (CBD)

Perth's cycling network is monitored using fixed bicycle counters located primarily on the Principal Shared Path (PSP) and Recreational Shared Path (RSP) network. There are 13 of these counters located on the CBD periphery, providing a daily count of cyclists on key bicycle routes into central Perth.

Over recent years, cycling statistics have fluctuated as shown in Figure 2.

Between 2010-11 and 2013-14 there was a significant increase in cycling numbers, which slowed into 2014-15. There was a significant decline between 2014-15 and 2015-16 (9 per cent), and a further minimal decline into 2016-17 (3 per cent). However, two counters on the cordons were unavailable in 2016-17 which would have impacted the total cycling numbers.

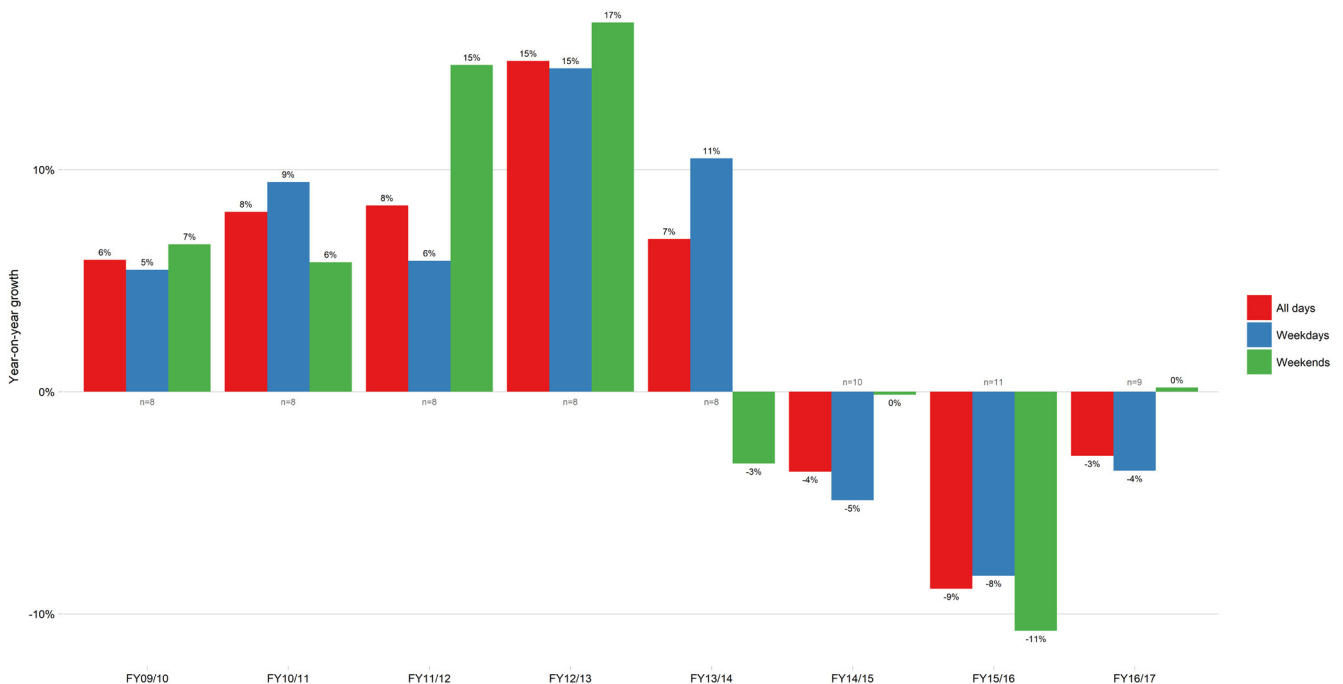
During 2016-17 an average of 8,300 riders crossed the Perth CBD cordon on weekdays and 7,100 on weekends. The busiest counter site was the Kwinana Freeway PSP at the Narrows Bridge West abutment, with around 2,100 riders per day.

There are a variety of factors that could have influenced the stagnation in cycling demand, including:

- The economic downturn in WA;
- A slower rate of population growth; and
- Closures and detours due to construction works along or in the vicinity of cycle paths.

There is evidence from other Australian capital cities to suggest the rate of cycling growth has stabilised over the past few years in much the same way that it appears to have done in Perth.

Figure 2. Annual change in cycling traffic into and out of the Perth CBD



Cycling for recreation/tourism/sport

Mountain bike riding, while just one form of cycling for recreation, sport and tourism purposes, continues to increase in popularity in WA. It is estimated that 19 per cent of Western Australians own a mountain bike, with 120,000 new mountain bikes purchased every year. The [*Western Australian Mountain Bike Strategy \(2015-2020\)*](#) outlines a vision for WA to embrace sustainable mountain biking, allowing the state to capitalise on this growing global trend.

WestCycle has prepared Mountain Bike Master Plans for the South West and Perth and Peel regions. These plans provide a framework for creating and sustaining international mountain bike destinations capable of providing a range of economic, tourism, environmental, health, social and community benefits.

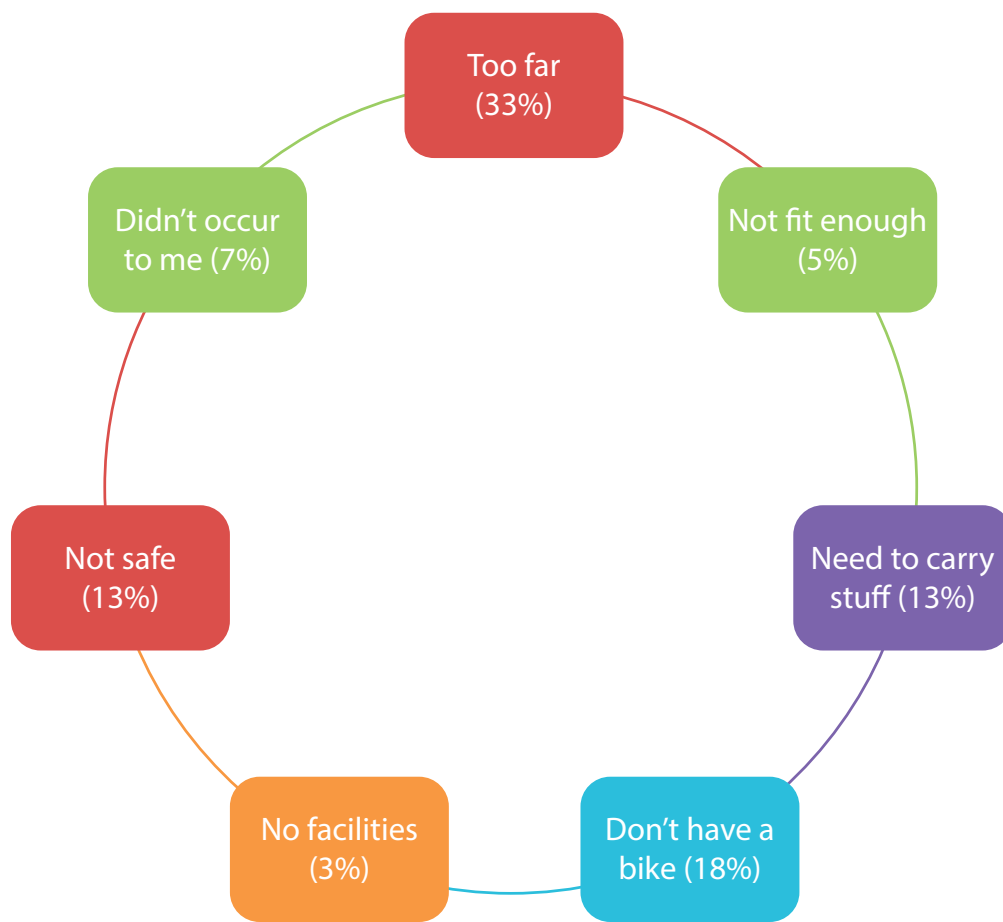
DoT will continue to collaborate with the community, advocacy groups and other government agencies to align bicycle network plans with mountain bike planning, as well as wider trail planning activities which offer opportunities for growth in cycle tourism.

Barriers to cycling

Measuring mode changes from cars to bicycles for short trips is important because at least half of all our car trips are less than 5 km; equivalent to 20 minutes cycling. Efforts are being made to change default behaviours that are perpetuated by perceived and actual barriers to cycling (Figure 3). This is occurring through actions within this Plan, travel behaviour change programs such as Your Move and community education campaigns run by the Road Safety Commission and WestCycle.



Figure 3. Barriers to cycling



COMMUNITY BENEFITS OF CYCLING

As a mode of transport, cycling provides numerous benefits for individuals and communities, as outlined in the following section.

Transport benefits

The *Australian Infrastructure Audit* completed by Infrastructure Australia in 2015 identified congestion as the leading challenge for cities and transport infrastructure networks. The audit predicted that Perth would have seven of the ten most congested roads in Australia by 2031.

Perth is also predicted to have the highest dollar cost of congestion by 2031 based on a forecast population increase of 77 per cent from 1.9 million to 3.3 million. To address this, Infrastructure Australia recommends considering travel demand management measures to make the best use of our roads.

Travel demand management measures are initiatives that influence the travel choices people make about why, when, where and how they travel and will become essential to improve traffic flow and reliability.

These measures are important because they can reduce inefficient car travel in the city as people change their mode or time of travel or simply travel less.

Main Roads Western Australia's (Main Roads) *Community Perceptions Survey 2015* identifies the public's two highest priorities for movement in WA to be:

- managing traffic congestion; and
- providing cycle links to major centres.

Recent research completed for the Danish Ministry of Transport compares for the first time, the costs and benefits of cars versus bicycles. Once they calculated the total costs and benefits (from an individual and societal perspective) they found that the cost of cars were 0.50 euros/km compared to 0.08 euros/km for cycling. Other studies, like the RAC analysis of the costs and benefits of cycling in WA found that benefits to the community from investing in cycling are between three and five times the costs incurred.

Economic benefits

Economic benefits of cycling that are evident when a bicycle is substituted for a car include:

- Reduced infrastructure costs – infrastructure projects to improve motor vehicle movement can be deferred if the demand is replaced by bicycle movement. Savings are significant due to the more efficient size of a bicycle compared to a car, and the fact that shared paths are also meeting the needs of pedestrians and people with disabilities. Savings include reduced costs associated with road construction, land acquisition, maintenance and parking facilities.
- Personal affordability – cycling is considered relatively inexpensive. Bicycles and required equipment are modestly priced and readily available with more than half of Perth's population already owning, or having a bicycle available.
- According to research commissioned by the RAC, investment in high-standard bicycle infrastructure, supported by programs to encourage cycling, will generate:
 - total community benefits (including strategic, health, economic and environmental) of at least 3.4 times the costs incurred; and
 - measurable financial returns for cyclists and for government that are nearly twice the costs incurred, with two-thirds of the benefits accruing to individuals and households in the form of reduced car operating costs and car parking charges.

Health benefits

Cycling has the potential to improve both mental and physical health. The physical health benefits to cyclists are far ranging and include reduced obesity levels, and reduction in the risk of cardiovascular disease and diabetes.

Cycling, as a form of physical exercise, can also reduce the effects of a number of mental health conditions such as depression and anxiety.

The Dutch, famous for their high participation levels in cycling for transport, recently found that due to cycling, approximately 11,000 deaths are prevented each year. Additionally, on average the Dutch have a life expectancy of six months longer than the average European. These health benefits also translate into economic benefits.

Environmental benefits

Riding is a carbon-neutral, energy-efficient transport mode, with a number of environmental benefits including:

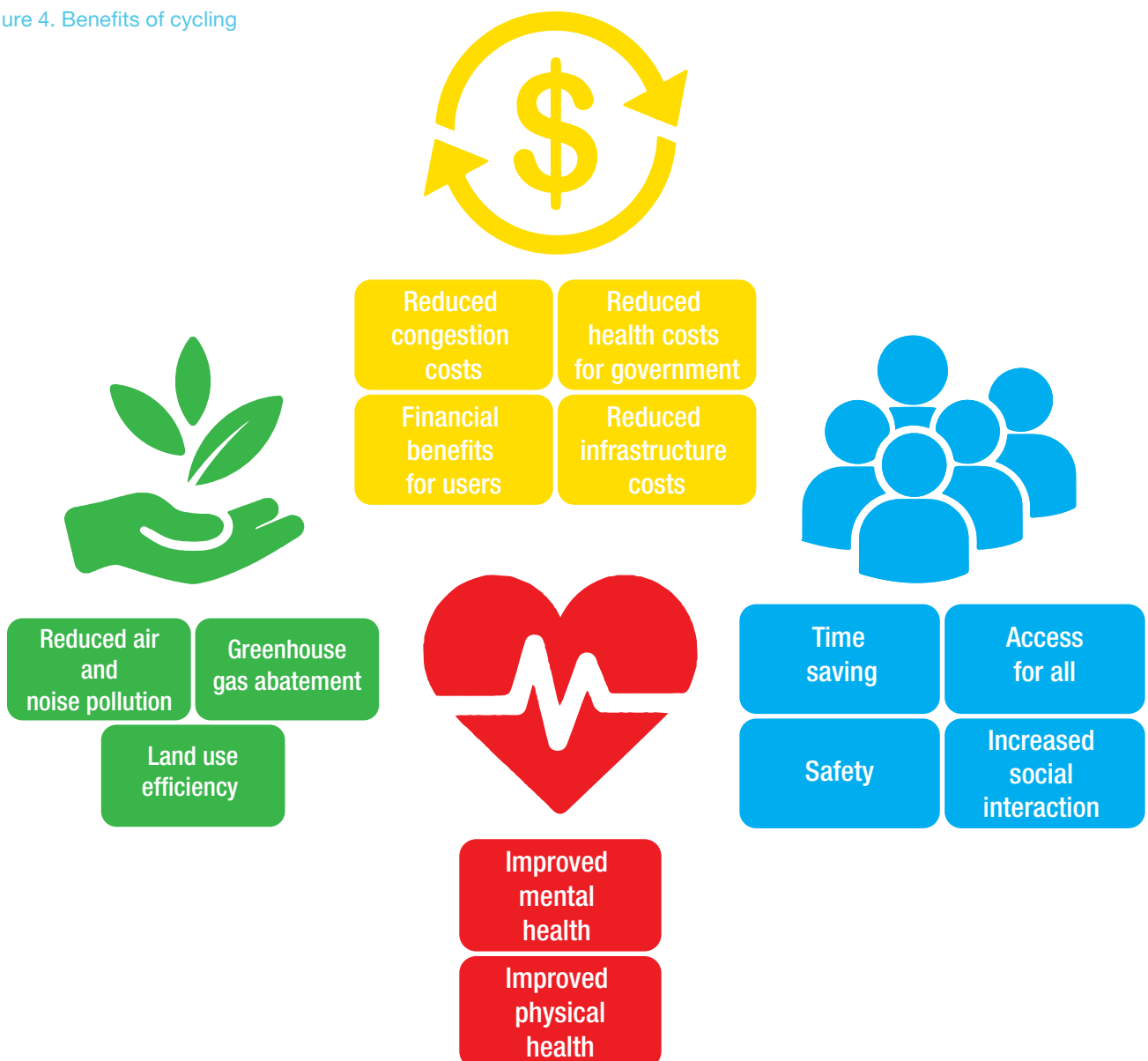
- Reduced air and noise pollution – cycling can help reduce air and noise pollution in dense urban centres.
- Lower greenhouse gas emissions – as a zero-emission mode of transport, cycling can lower transport-associated emissions. Every kilometre of car travel avoided saves up to half a kilogram of greenhouse gases being emitted. This equates to a 5 km (15 minute) cycle commute each working day saving 1.2 tonnes of greenhouse gases annually.
- Land use efficiency – where cycling is a significant transport mode, less land is needed for infrastructure such as roads and car parks. This space can then be used to increase community amenities.

Social benefits

Cycling is a social activity. It activates spaces and allows people to interact with each other and the environment, resulting in a number of benefits including:

- Time saving – cycling is often faster than driving during peak hours in urban areas for distances up to 10 km.
- Access for all – cycling facilities, particularly shared use paths, help meet the needs of pedestrians and people with disabilities and improve accessibility for everyone including the elderly and children.
- Safety – higher numbers of cyclists improves safety by conditioning motorists to expect and watch out for cyclists. The more cyclists, the safer they are through safety in numbers.

Figure 4. Benefits of cycling





KEY ACTIONS

In order to achieve its vision and objectives, the WABN Plan is comprised of a series of key actions. These initiatives are designed to provide a safe and sustainable bicycle network between major activity and attraction areas. Since the launch of the WABN Plan, some initiatives have been redesigned and expanded, and in some cases, provided with additional funding. The action relating to a review of traffic management on local roads is currently being finalised and as such is not listed below.

These key actions align with existing roles and responsibilities of DoT, Main Roads, Public Transport Authority (PTA) and other agencies with cycling related functions.

There are many complex and dynamic projects to be implemented that will require a staged approach, including studies, planning and design, construction and implementation. Many rely on the completion of higher priority recommendations. Consequently, indicative targets and timelines have been assigned to actions where possible. These timelines are reviewed by DoT on a quarterly basis.

Figure 5. Key actions of the WABN Plan



LONG-TERM CYCLE STRATEGY FOR PERTH

Cycling is an increasingly important mode of transport for both recreational and commuter trips. The Long-Term Cycle Strategy for Perth represents the vision for a fully integrated cycling network that provides high-quality infrastructure to activity centres, local communities and places of work. It acknowledges the important role cycling plays in creating vibrant, connected and productive cities.

A number of new routes are planned with the intention of expanding the off-road network to create seamless connectivity and cater for population growth. The network will include additional river and lake crossings and will be planned in consultation with local government and other relevant State Government agencies.

Cyclist safety is considered paramount, so better-quality facilities for cyclists will be designed to encourage more people to cycle. In the Perth CBD, protected cycle lanes will replace some on-street car parking and traffic lanes. In the metropolitan area, safe active streets (bike boulevards) will be designed and constructed at a number of locations with the intention of improving safety and increasing connections to local destinations.

The Long-Term Cycle Strategy for Perth will allow DoT and local government to identify gaps in the existing cycling network. The key focus will be to provide continuous cycle routes along major corridors establishing links between Perth's various strategic, secondary, district and specialised activity centres and public transport services.

These routes will be safe and attractive options for all cyclists regardless of age, confidence or experience level. The proposed long-term cycling network is illustrated in Figure 6.

Related WABN objectives

Objective 2 – Encourage cycling to build active and healthy communities

Objective 3 – Provide a high-quality, interconnected bicycle network

Objective 4 – Improve the level of safety for people cycling

Objective 5 – Build and enhance relationships with advocacy groups and stakeholders

Agencies responsible

DoT (Project Chair)

Main Roads

PTA

Local government

Metropolitan Redevelopment Authority

Stakeholders

Various WABN Infrastructure Reference Group members

Targets and timelines

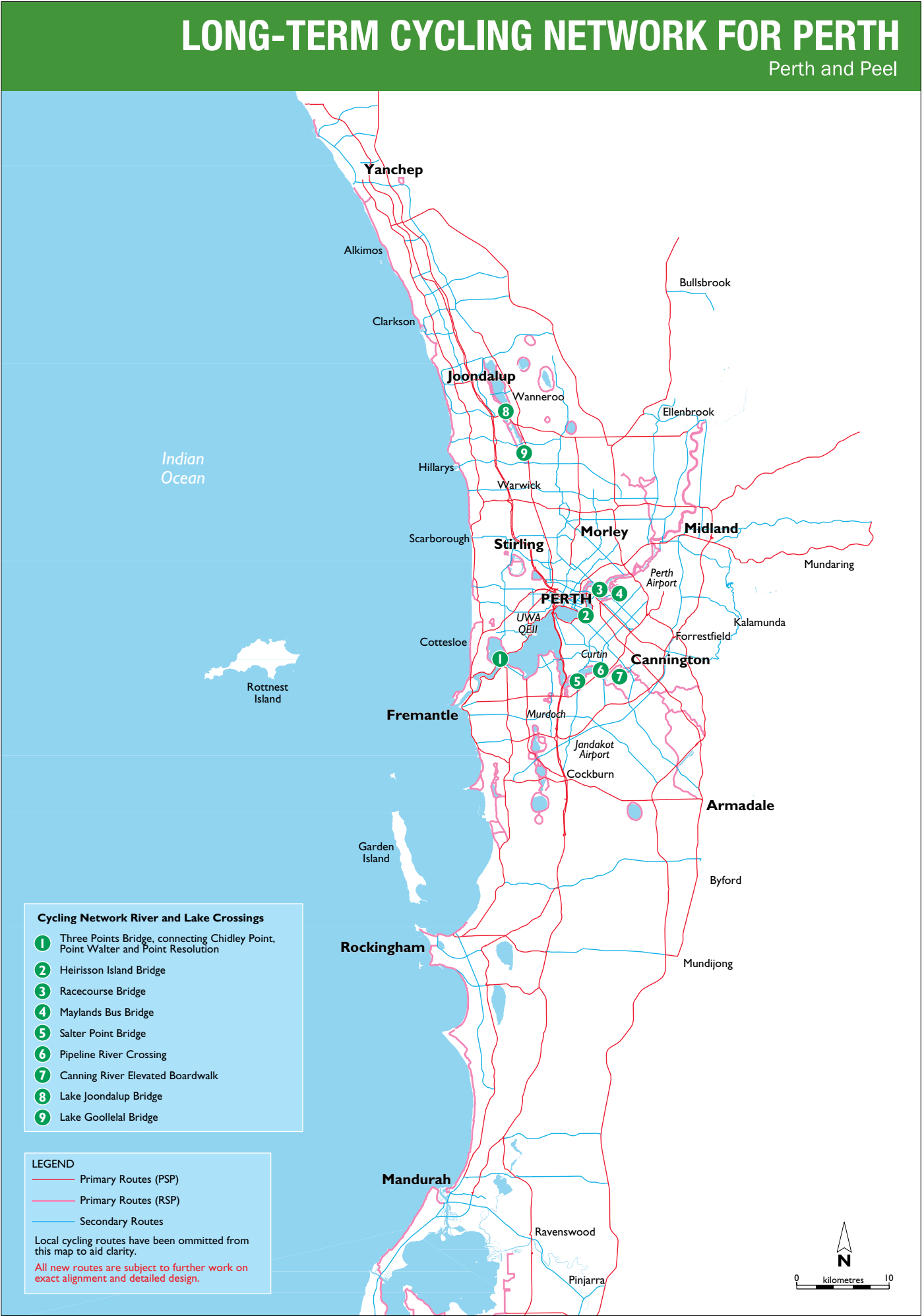
State and local government to agree on the bicycle network by the end of 2019.

Funding

Funding will be provided through the existing Transport Portfolio budget.



Figure 6. The proposed long-term cycling network for Perth



EXPANSION OF THE PSP NETWORK

PSPs are high-standard bicycle routes for longer, more direct cycling trips, with minimal interruption from other traffic. Construction of PSPs, such as the one alongside the Kwinana Freeway from the Narrows Bridge to the Mount Henry Bridge, commenced several decades ago. Many PSPs run parallel to a local road network that provides for, or has the potential for a separate pedestrian footpath. In these locations, Principal Cycle Paths (PCPs) will be introduced as an extension to the PSP network, and are designed for cycling only.

As part of METRONET, the State Government is committed to providing a widespread, connected and well maintained PSP network and has allocated additional funding to the existing budget. As the main demand for commuter cycling is within a 15 km radius of the Perth CBD along freeways and railway lines, the priority PSP projects will focus on this area up until 2023. This will help obtain maximum benefit and create a safe environment for cyclists travelling to and from the busy CBD area. Figure 7 shows the sections of the PSP network that are currently funded.

The construction order of the priority links has been determined by constructability, safety improvements for existing facilities, connectivity and available funding. The PSP Program should focus on long lengths of path to realise economies of scale, reduce overall costs and improve connectivity of the network. Detailed design for each priority link will be completed in advance of construction funding being allocated. DoT will also undertake travel behaviour change and community activation initiatives to promote newly opened sections of the network to local residents and bicycle user groups.

To guide the development of an improved PSP network DoT, in liaison with Main Roads and the PTA, has prepared a PSP Policy. This high level policy document will help guide program delivery and will specify technical details to ensure the consistent delivery of infrastructure across the path network.

Further information on the PSP Program is available in the supplementary appendix. This includes a list of projects that have been delivered since the WABN Plan was first released and details of priority PSP projects through to 2033.

Related WABN objectives

Objective 1 – Build evidence and demonstrate the benefits of cycling for the community

Objective 3 – Provide a high-quality, interconnected bicycle network

Objective 4 – Improve the level of safety for people cycling

Agencies responsible

DoT (Project Chair)

Main Roads

PTA

Stakeholders

Local government

Targets and timelines

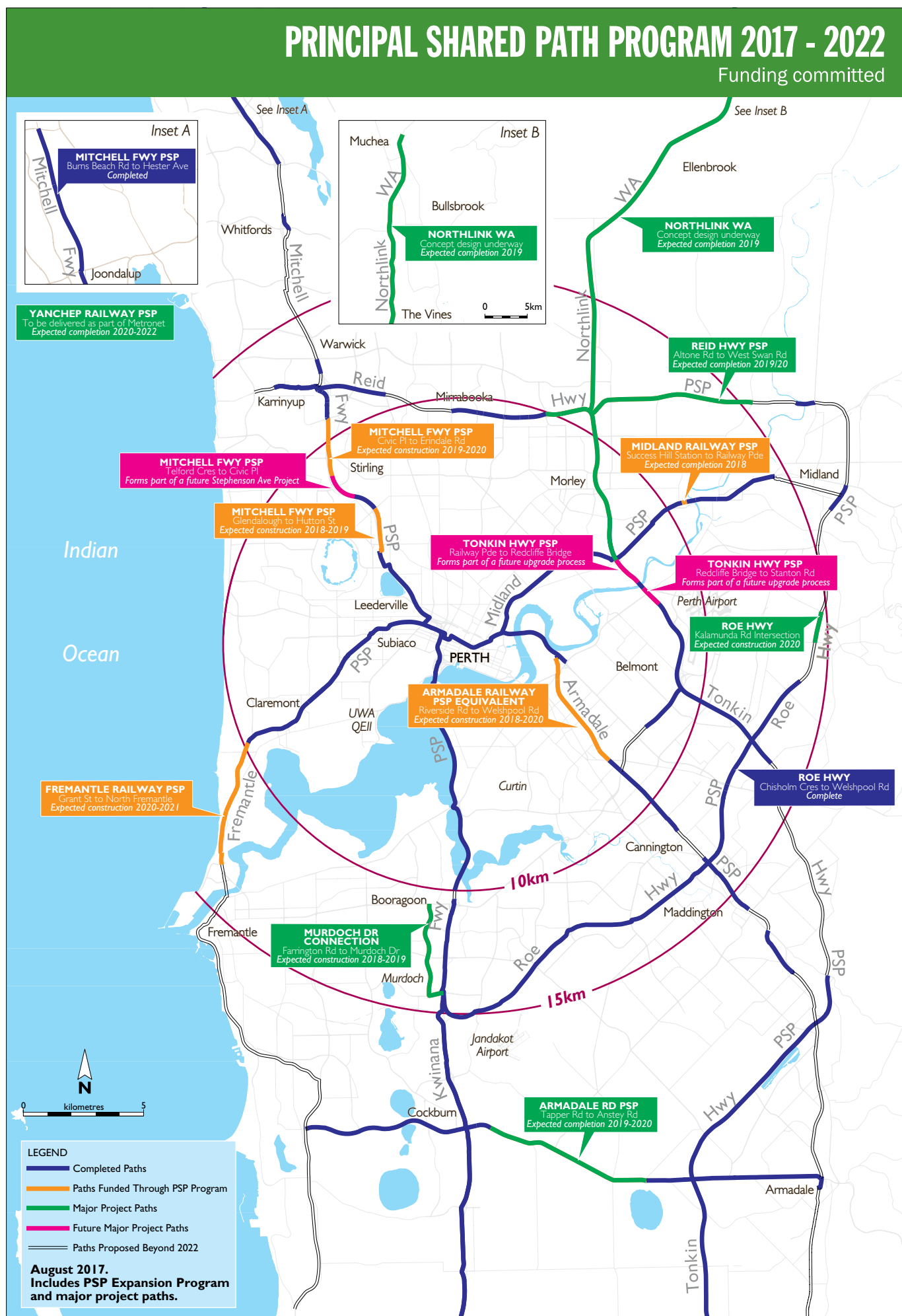
Priority links within a 15 km radius of the Perth CBD will be completed by 2023 and an implementation plan for the construction of the PSP projects over the next three years will be made available on the DoT website.

Funding

Funding of \$54.7 million has been committed to the PSP Program through to 2021:

2017-18	2018-19	2019-20	2020-21	Total
\$7.34m	\$7.34m	\$20m	\$20m	\$54.68m

Figure 7. Funded PSP Program 2017 – 2022



PERTH BICYCLE NETWORK GRANTS PROGRAM

The PBN Grants Program is an important aspect in raising the profile of cycling at a local government level and in ensuring network infrastructure is continuous across local government boundaries in metropolitan Perth.

The program is administered by DoT and matches local government expenditure dollar-for dollar for the planning, design and construction of bicycle infrastructure in accordance with State Government priorities as set out in this Plan. Local governments are encouraged to seek funding under the program in accordance with these plans, as well as the priorities identified within their own strategic plans.

DoT also supports the development of bicycle plans through the program. However, local governments should contact DoT prior to embarking on this process to ensure alignment with the consultation activities occurring as part of finalising the Long-Term Cycle Strategy for Perth.

To improve the efficiency of the assessment process, the following changes have been introduced to the grants program:

- A two-staged application process – an expression of interest and then full application;
- Prioritisation of projects with greater local and state strategic alignment; and
- Funding for projects over two to three years to allow for concept planning and design before construction.

The PBN Grants Program prioritises projects that increase cycling mode share and provide connections to activity centres, schools, and railway stations.

Over the past three years, 40 PBN projects have been funded. Three of the key projects completed are shown in Table 1.

Further information about the PBN Grants Program is available on the [DoT website](#).

Related WABN objectives

Objective 1 – Build evidence and demonstrate the benefits of cycling for the community

Objective 2 – Encourage cycling to build active and healthy communities

Objective 3 – Provide a high-quality, interconnected bicycle network

Objective 4 – Improve the level of safety for people cycling

Objective 5 – Build and enhance relationships with advocacy groups and stakeholders

Agencies responsible

DoT (Project Chair)

Local government

Main Roads

Stakeholders

WABN Implementation Reference Group members

Grant process and timelines

Figure 8 shows the typical grant process however is subject to change.

Funding

Funding of \$8.5 million has been committed to the PBN Program through to 2021:

2017-18	2018-19	2019-20	2020-21	Total
\$1.5m	\$2m	\$2.5m	\$2.5m	\$8.5m

Figure 8. A typical WABN Grants Program timeline

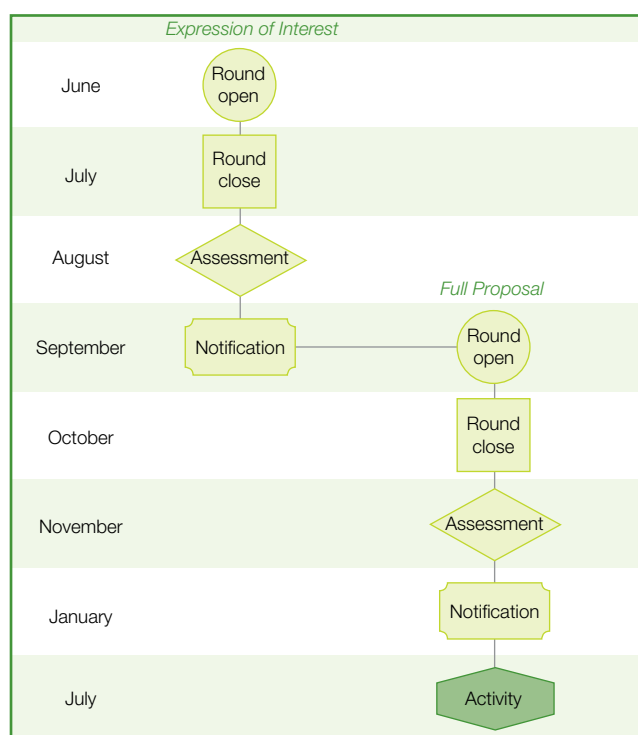


Table 1. Key achievements of the PBN Grants Program

Location	Description	Length	Costing
Safety Bay Road	The Safety Bay Road Shared Path project is located between Warnbro Train Station and Nairn Road in Baldivis. Stage one and the first section of stage two of the project were completed in 2015-16. Stage two was completed in May 2017. The shared path provides a separated, safe cycling and walking connection to the Warnbro Train Station for Baldivis residents which previously did not exist. This will make active transport trips more attractive for those who live in close proximity to the station.	4.5 km	\$3.2m
West Swan Road Shared Path	The West Swan Road Shared Path project is located between north of Henley Street and Gnangara Road. Stage one of the project was completed in 2015-16. Stage two was completed in May 2017. The shared path provides a separated, safe cycling and walking connection between Ellenbrook and the Swan Valley and Midland.	1.25 km	\$760k
Byford to Mundijong Shared Path	<p>The Byford to Mundijong Shared Path project will provide a separated, safe cycling and walking route between Byford and Mundijong. The project began in 2012-13 and has been staged over multiple years:</p> <p>2013-14: Completion of the shared path between Richardson Street and Kiernan Street, Mundijong</p> <p>2014-15: Completion of the shared path on Soldiers Road between Kiernan Street and Bishops Road, Roleystone</p> <p>2016-17: Detailed design for the shared path between Bishops Road and Abernathy Road</p> <p>Once complete, the link will provide a strategic connection between Byford and Mundijong as well as connecting to schools located along the route. The route provides recreational opportunities via the cycle path along Patterson Street and Soldiers Road.</p>	9 km	\$544k



Safety Bay Road Shared Path opening

REGIONAL BICYCLE NETWORK GRANTS PROGRAM

The RBN Grants Program is an important aspect in raising the profile of cycling with local governments and in ensuring bike infrastructure meets the needs of all cyclists in regional WA. The RBN grants match local government expenditure on a dollar-for-dollar basis for the planning, design and construction of bicycle infrastructure. DoT also supports the development of strategic bicycle plans through the RBN program. However regional local governments should contact DoT prior to embarking on this process to ensure alignment with the long-term bicycle planning currently being led by DoT across regional WA.

As with the PBN Grants Program, the same changes have been made to the RBN Grants Program to improve the efficiency of the application process:

- A two-staged application process – an expression of interest and then full application;
- Prioritisation of projects with greater local and state strategic alignment; and
- Funding for projects over two to three years to allow for concept planning and design before construction.

The RBN Grants Program prioritises projects that increase safety for people on bikes, provide connections to activity centres, schools and other strategic destinations, and increase cycle tourism opportunities.

Over the past three years, 57 RBN projects have been funded and delivered. Three of the key projects completed are outlined in Table 2.

Further information about the RBN Grants Program is on the [DoT website](#).

Related WABN objectives

Objective 1 – Build evidence and demonstrate the benefits of cycling for the community

Objective 2 – Encourage cycling to build active and healthy communities

Objective 3 – Provide a high-quality, interconnected bicycle network

Objective 4 – Improve the level of safety for people cycling

Objective 5 – Build and enhance relationships with advocacy groups and stakeholders

Agencies responsible

DoT (Project Chair)

Local government

Main Roads

Stakeholders

WABN Implementation Reference Group members

Relevant Regional Development Commissions

Department of Primary Industries and Regional Developments

Grant process and timelines

Figure 8 shows the typical process the program would follow however may be subject to change.

Funding

Funding of \$8.5 million has been committed to the RBN Program through to 2021:

2017-18	2018-19	2019-20	2020-21	Total
\$1.5m	\$2m	\$2.5m	\$2.5m	\$8.5m

Table 2. Key achievements of the RBN Grants Program

Location	Description	Length	Costing
Bussell Highway Shared Path	This path provides Dallyellup residents with a route into Bunbury, and allows students from Bunbury and College Grove to access the schools in Dallyingup. The path was completed in April 2017.	1.6 km	\$445k
Dunsborough to Busselton Recreational Shared Path	This path filled a key missing link between Geographe Bay Road and Toby's Inlet providing a safe alternative to cycling on the road. It connects Dunsborough and Busselton for residents and visitors and was completed in June 2014.	1.4 km	\$600k
Karratha Projects	In 2013-14 and 2014-15 a shared path along Dampier Highway was constructed linking parts of the town to existing paths and providing a safe alternative to cycling on the highway. Over 2015-16 and 2016-17 a shared path on Balmoral Road was completed allowing residents and visitors to commute by bike from anywhere within the western Karratha suburbs to the Karratha CBD, providing access to the heart of the Pilbara for shopping, cafes, and services.	9 km	\$566k \$737k

LONG-TERM CYCLE STRATEGY FOR REGIONAL WA

In recent years, populations in large regional centres have been growing rapidly. These centres increasingly require cycling facilities of an urban standard. Residents and tourists have come to expect a higher level of bicycle (and pedestrian) connectivity between key destinations. Bicycle facilities should ideally provide for commuting and for short and recreational trips to key locations. Cycle-tourism is also becoming increasingly popular and there are many opportunities in regional WA to capitalise on this potential.

DoT are partnering with local governments to develop long-term strategic bicycle plans in the regions. Starting with major regional centres such as Bunbury, Busselton and Geraldton, these plans focus on transport cycling in and around town centres. In some areas, such as through the South West, inter town connectivity is a key consideration. Where a regional centre is surrounded by two or more municipalities, councils will be encouraged to develop a joint strategic plan, following the successful example of the *Greater Bunbury Regional Master Plan*.

These aspirational plans will focus on the long-term strategic vision of cycling in the area, in a similar approach to the Long-Term Cycle Strategy for Perth. In particular, a network hierarchy will be applied to designate principal, strategic and local routes:

- **Primary routes** – Primary routes are high demand corridors that connect to major destinations. They provide high-quality, safe, convenient (and where possible uninterrupted) routes that form the spine of the cycle network. These routes are conducive to medium or long distance commuting/utility, recreational, training and tourism trips.
- **Secondary routes** – Secondary routes have a lower demand than primary routes, but provide similar levels of quality, safety and convenience. These routes provide connections between primary routes and major activity centres such as shopping precincts, industrial areas or major health, education, sporting and civic facilities.
- **Local routes** – Local routes are low demand and are predominantly located in local residential areas. They provide access to higher order routes and local amenities

and recreational spaces. Changes to traffic management devices and cul-de-sacs may also be proposed, where these have not been designed with cycling in mind, particularly in the use of safe active streets.

Larger centres such as Bunbury, Busselton and Geraldton are more likely to include high standard primary routes than smaller regional towns. For all centres, a combination of routes will be identified. The plans will also consider long distance cycling trails and on road training circuits which are important for facilitating inter-regional connectivity, safer long distance riding and growth in cycle-tourism.

The plans will include short-term prioritisation plans which will be used to guide future funding through the RBN Grants Program for dedicated cycling infrastructure.

Related WABN objectives

Objective 2 – Encourage cycling to build active and healthy communities

Objective 3 – Provide a high-quality, interconnected bicycle network

Objective 4 – Improve the level of safety for people cycling

Objective 5 – Build and enhance relationships with advocacy groups and stakeholders

Agencies responsible

DoT

Regional local government

Stakeholders

DoT will partner with local governments in major regional centres to assist in creating Strategic and Operational Development Plans.

Funding

Consultation processes will be funded via existing Transport Portfolio budget. Cycling infrastructure for regional cities can be funded through the RBN Grants Program.

PERTH CENTRAL AREA CYCLING PROJECTS

DoT is working with the City of Perth to develop a smart, reliable and sustainable central city transport network that is integrated and prioritises the movement of people. This work considers key destinations and activity centres that border the Perth CBD to identify transport links that are vital to accessing the central area.

Key cycling network features include:

- **Bicycle path infrastructure** - constructing different types of cycling infrastructure, such as on-road bicycle lanes, contra-flow bicycle lanes and two-way off street bicycle paths.
- **Bicycle end-of-trip (EOT) facilities** - increasing publicly available bicycle EOT facilities around the Perth central area, both in public spaces and as part of new developments and redevelopments.
- **Travel behaviour change** - encouraging active transport alternatives to access CBD destinations and workplaces within the central area through the implementation of behaviour change programs and way-finding information.

Under the Perth Parking Policy and associated legislation, a parking levy (commonly known as the Perth Parking Levy or PPL) is applied on non-residential parking bays within the central Perth area. Revenue from the PPL goes into the Perth Parking Management Fund (PPMF) which is spent on initiatives that make access by public transport, walking and cycling in the Perth central area more attractive and sustainable.

Improvements to the key cycling network features identified above can be funded through the PPMF. Recent projects include the shared paths on Roe and Railway Streets on the northern side of the Fremantle Line, Barrack Street on road cycle lanes south of St Georges Terrace, the digital display counter on Barrack Street and the Your Move Central Program which is currently under development.

The following projects have been identified as priorities to help deliver an attractive, convenient and efficient cycle network in the CBD over the next five years:

Table 3. Key cycling infrastructure projects in the Perth central area

Cycling route	Coverage
Kings Park Road	Cliff Street to Thomas Street
Thomas Street	Wellington Street to Stirling Highway
Barrack Street Bridge	Wellington Street and Barrack Street intersection
Milligan Street – Stage two	St Georges Terrace to Wellington Street
Colin Street	Kings Park Road to Arthur Street

Completion of the PSP along the Armadale Line and construction of a new pedestrian and cycling bridge adjacent to the Causeway Bridge via Heirisson Island have also been identified as key projects that will prioritise safe bicycle access to the CBD for both commuters and recreational users.

To support cycling initiatives in the CBD, there are several locations where digital display cycle counters will be installed over the next five years. The installations will build on the success of the counter installed on Barrack Street (between Hay Street and St Georges Terrace) which improves the status of cycling in the CBD and enables the collection of valuable data.



The PTA has identified the installation of new bicycle shelters and associated cycling facilities at City West and Elizabeth Quay Train Stations. The proposed infrastructure will be built within the next five years.

Related WABN objectives

Objective 3 – Provide a high-quality, interconnected bicycle network

Objective 4 – Improve the level of safety for cyclists

Objective 5 – Build and enhance relationships with advocacy groups and stakeholders

Agencies responsible

DoT (Project Chair)

Main Roads

PTA

City of Perth

Metropolitan Redevelopment Authority

City of Vincent

Stakeholders

Various WABN Implementation Reference Group members

Department of Biodiversity, Conservation and Attractions

City of South Perth

Affected indigenous groups

Targets and timelines

Short-term priority projects in the Perth central area include:

- Cycling facilities along Kings Park Road between Thomas Street and Cliff Street;
- New PSP connection on Thomas Street between Wellington Street and Stirling Highway;
- Upgrade to the Barrack Street Bridge to better connect the Barrack Street bike lanes to the Roe Street PSP;
- Cycling facilities on Milligan Street to better connect the PSP at Mount Street Bridge with Wellington Street;
- Protected cycle lanes on Colin Street, connecting Kings Park Road to the Fremantle PSP at Arthur Street;



- Installation of additional digital display counters; and
- Installation of new bicycle shelters at City West and Elizabeth Quay stations.

Priority projects that will improve access into the Perth central area include:

- Completion of the missing link on the Armadale PSP between Riverside Road and Welshpool Road;
- Realignment and upgrades to the Mitchell Freeway PSP between Glendalough Station and Hutton Street; and
- Construction of a new pedestrian and cycling bridge adjacent to the Causeway Bridge via Heirisson Island (longer term).

Funding

Planning, design and construction of cycling infrastructure in the Perth central area can be funded through the PPMF. This includes supporting infrastructure such as cycle display counters and bicycle shelters.

PSP projects are funded through the PSP Program.

CONNECTING SCHOOLS

The number of children cycling to school in WA at both primary and secondary levels has fallen significantly over the past decade for a variety of reasons. Increasing the number of students who cycle to school has many benefits including improved physical and mental health, reduced congestion at school drop-off and pick-up times and encouraging the take-up of cycling as a viable transport option for short trips. Connecting Schools is a grants program aimed at improving bicycle access and EOT facilities for schools.

The Connecting Schools Program is funded from the PBN Grants Program and the RBN Grants Program. The projects chosen for funding have undergone an assessment process to ensure they complement the program's objectives. Funded programs include the provision of EOT facilities (bicycle racks, scooter racks, bicycle sheds, bicycle shelters) and innovative cycling infrastructure projects, which have not been traditionally funded through categories of the PBN and RBN Grants Programs. Shared paths, way-finding signage and sensory paths are examples of some innovative projects that have been funded in the past. A mandatory commitment of active engagement with the Your Move behaviour change program and the adoption of behaviour change approaches are required before funding is allocated.

Related WABN objectives

Objective 2 – Encourage cycling to build active and healthy communities

Objective 4 – Improve the level of safety for cyclists

Objective 5 – Build and enhance relationships with advocacy groups and stakeholders

Agencies responsible

DoT (Project Chair)

Local government

Schools

Stakeholders

Various WABN Implementation Reference Group members

Targets and timelines

The Connecting Schools Program opens at the same time as the PBN and RBN Grants Programs.

Funding

Funding for Connecting Schools projects is made available through the PBN and RBN Grants Programs.



CONNECTING STATIONS

In recent years commuters have been increasingly combining cycle trips with rail or bus journeys. As a result, the demand for secure bicycle storage at rail stations has increased. All new METRONET stations will include bike storage and EOT facilities. A bicycle shelter that holds 64 bicycles costs approximately \$70,000, compared with a 50-bay car park that costs \$448,000. This highlights that secure bicycle parking is a space saving, cost effective solution.

The PTA, in partnership with DoT, Main Roads and local governments, has initiated the Rail Station Access Improvement Program that will help define future interventions and investment required to meet access demands. A review will analyse station's existing patronage, internal and surrounding infrastructure and establish current and future mode share targets to develop individual catchment areas for each station. Strategies will be developed based on each analysis and will include assessing both on-road and off-road cycling facilities, EOT facilities and bicycle parking, to identify infrastructure needs to maximise capacity. It will also include preliminary designs for improved cycling facilities.

Surveys of users will be conducted in order to better ascertain the behaviour and decision making of users at each station. The outcomes of each strategy will be unique to its location, its current and planned future usage, resulting in infrastructure needs varying greatly across the network.

All 71 stations on the network are included in the Rail Station Access Improvement Program and have been grouped by line and then by local government area. The Program will be carried out in seven workable stages over two years. The initial pilot study will produce a Station Access Strategy for four stations; Bayswater, Meltham, Maylands and Mt Lawley. A Station Access Strategy for each individual station will be completed by 2018.

Related WABN objectives

Objective 2 – Encourage cycling to build active and healthy communities

Objective 4 – Improve the level of safety for cyclists

Objective 5 – Build and enhance relationships with advocacy groups and stakeholders

Agencies responsible

PTA

DoT

Main Roads

Local government

Stakeholders

Various WABN Implementation Reference Group members

Targets and timelines

The Rail Station Access Improvement Program pilot study will be completed in 2018.

Funding

Upgrades to existing, or the provision of new, cycling infrastructure within the station precinct will be funded by the PTA. Outside of the station precinct, the Transport Portfolio and local government will fund infrastructure upgrades via the PBN Grants Program.



SAFE ACTIVE STREETS PROGRAM (BIKE BOULEVARDS)

Typically, neighbourhood streets in traditional Perth suburbs are designed to support the efficient movement of motorised vehicles, but are often considered a hostile environment for walking and cycling.

The introduction of safe active streets at particular locations create safer ways for cyclists to travel on the road network by providing a shared space for vehicles and cyclists.

Safe active streets are cycle routes on quiet local streets, where speeds have been reduced to 30 km/h to allow people in cars and on bikes to share the street safely. With lower traffic speeds, streets are also much safer for pedestrians and children, and additional tree planting and landscaping make them more attractive places to walk or ride.

Like any transport network, establishing a coherent, continuous route that enables access to local attractions, amenities, activity centres and other transport networks is important when determining the location of safe active streets. To this end, DoT has been working closely with three local governments to deliver three pilot projects;

- City of Vincent – Shakespeare Street Bike Boulevard – stage one completed in December 2016. Planning for stage two is currently underway;
- City of Bayswater – Leake Street and May Street Bike Boulevard – Construction of the section on May Street between Adelphi Street and Railway Parade was completed in June 2017. Planning is underway for the next section which connects to Morley Strategic Centre. Construction is planned for 2017-18; and
- City of Belmont – Surrey Road Bike Boulevard (Leach Highway to Great Eastern Highway) – construction underway.

Following on from the pilot projects, DoT has commenced work with a number of other local governments on safe active street projects. This includes;

- City of Canning;
- City of Nedlands;
- Town of Claremont;
- Town of Bassendean;
- City of Stirling;
- Town of Victoria Park;
- City of Melville; and
- City of Kalgoorlie-Boulder.

Further information on the Safe Active Streets Program is provided in the Supplementary Information and on the [DoT website](#).

Related WABN objectives

Objective 1 – Build evidence and demonstrate the benefits of cycling for the community

Objective 2 – Encourage cycling to build active and healthy communities

Objective 3 – Provide a high-quality, interconnected bicycle network

Objective 4 – Improve the level of safety for people cycling

Objective 5 – Build and enhance relationships with advocacy groups and stakeholders

Agencies responsible

DoT (Project Chair)

Main Roads

Local government

Stakeholders

Various WABN Implementation Reference Group members

Local residents

Targets and timelines

Construction of all the three pilot projects will be completed by mid-2018. Planning has commenced for a number of other safe active streets in the metropolitan and regional area's with a view to possible construction in 2017-18.

Funding

\$3 million has been allocated for 2017-18 and the following three years.

Shakespeare Street Bike Boulevard, Mount Hawthorn

The first stage of the Shakespeare Street Bike Boulevard in Mount Hawthorn was constructed between June and December 2016. The boulevard was opened with a community event on 4 December 2016. As the photos show there is a stark contrast between the previous wide and open layout and what is now in place.



Before



Entry statement



Raised intersection



Slow point

CYCLE COUNTING AND MONITORING

Cyclist monitoring and trip counting on the PBN is currently based on fixed bicycle counters that have been installed progressively since 2008.

These counters provide an accurate, continuous count of cyclists at 41 different locations in the metropolitan area. This includes five new counters installed in 2016-17.

There are also now eight permanent counters installed in regional areas and DoT is working with several regional local governments to integrate other existing counters into the online system.

The number of counters will increase as our PSP and RSP network continues to grow and other cycling aspects are implemented.

An opportunity exists for the State Government to further develop what data is collected, when it is collected and how it is analysed and reported to the community. To do this, a bicycle network counting and monitoring strategy was prepared by DoT in line with the WABN Plan. The strategy outlines a future direction for counting and

monitoring in order to assess the effectiveness of the projects and recommendations contained within the WABN Plan.

To deliver on the recommendations outlined in the strategy, DoT has prepared an implementation plan for additional permanent counters on the PBN. The implementation plan recommends prospective sites for the installation of counters, both on existing and proposed roads and off-road paths including;

- completing a cordon around the Perth CBD;
- establishing a Fremantle CBD cordon;
- adding counters to the existing PSP and RSP networks where there are gaps; and
- adding counters to recently completed, under construction or proposed PSPs and RSPs.

The existing counter locations are shown in Figures 9 and 10.

DoT has also been investigating how large existing data sets can be used to better understand travel behaviour and plan for the future.

Related WABN objectives

Objective 1 – Build evidence and demonstrate the benefits of cycling for the community

Objective 3 – Provide a high-quality, interconnected bicycle network

Agencies responsible

DoT (Project Chair)

Main Roads

PTA

Stakeholders

Various WABN Implementation Reference Group members

Local government

Targets and timelines

Counters will be progressively installed over the coming years.

Funding

The program will be funded through the existing Transport Portfolio budget and PPMF.

Figure 9. Existing counter locations within the Perth CBD

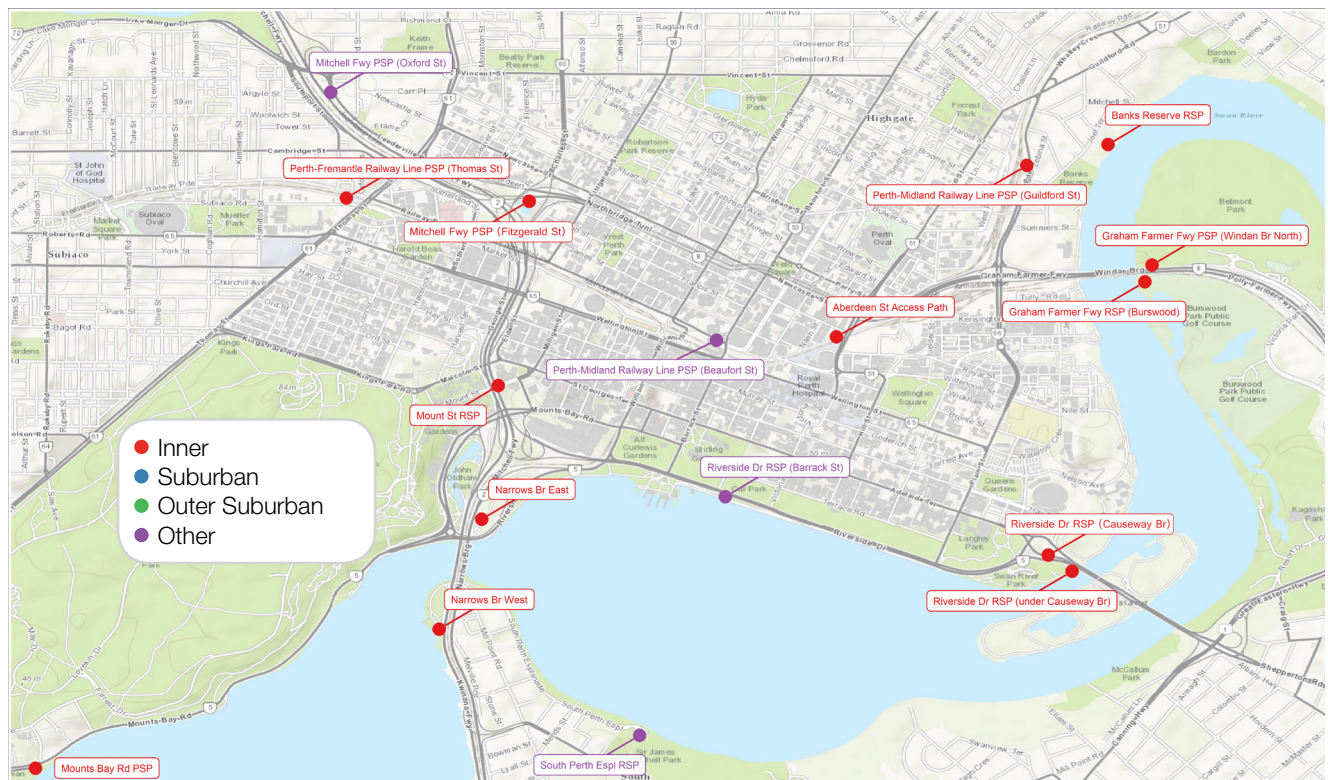
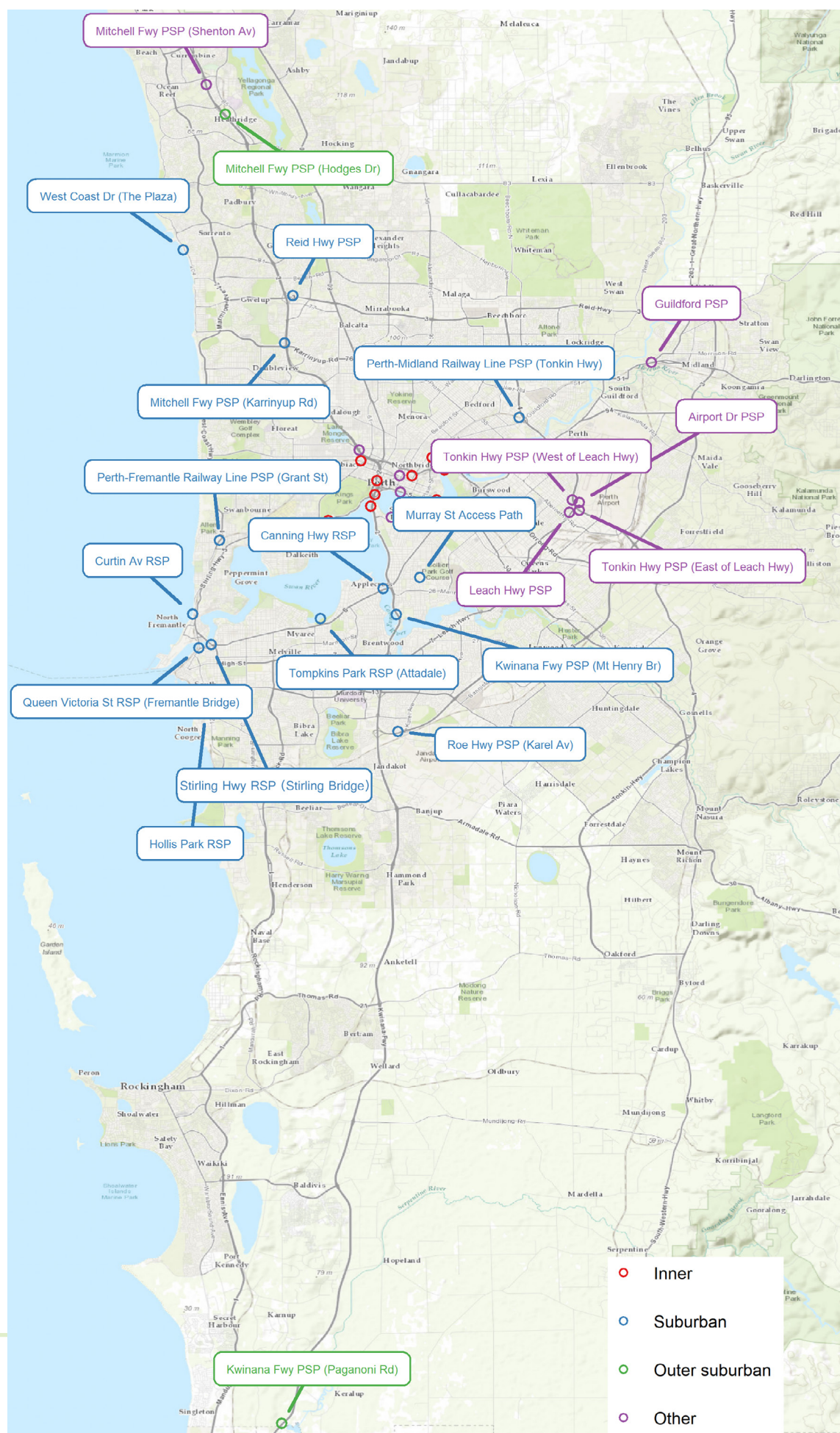


Figure 10. Existing counter locations



JOURNEY PLANNER AND HAZARD REPORTING TOOL

The use of online journey planning tools, such as the Transperth Journey Planner application, helps people make informed choices about their mode of travel and actively encourages non-car trips.

DoT is investigating the development of a multi-modal journey planner tool to assist with trip planning by bicycle, walking and public transport. The tool will ideally link with the Transperth Journey Planner to maximise benefit.

Where possible, the journey planner will incorporate key functionality including the ability to:

- Personalise the tool to suit user preferences and capabilities;
- Refine trip route to maximise path use, identify low traffic routes, or identify the fastest route based on rider needs;
- Refine trip route based on user preference – roads only, roads and shared paths or shared paths only; and
- Identify the route to several destinations across the Perth metropolitan area.

Ideally the tool will provide options for a journey plan to the preferred destination, such as a train station, and provide approximate travel times, route conditions and details of EOT facilities available at the destination.

A hazard reporting functionality would also be provided to allow users to report hazards or incidents and provide instant feedback to relevant authorities.

In later stages, the tool is intended to include a complementary online planning application for smart phones. This application could be used along the actual journey and would be useful for tourism and recreational cycling as well as commuting.

Shared paths and on-road facilities across the Perth metropolitan area have been mapped for inclusion in the tool.

Related WABN objectives

Objective 1 – Build evidence and demonstrate the benefits of cycling for the community

Objective 2 – Encourage cycling to build active and healthy communities

Objective 4 – Improve the level of safety for people cycling

Agencies responsible

DoT (Project Chair)

Stakeholders

PTA

Local governments

Various WABN Implementation Reference Group members

Targets and timelines

Concept development for the web-based tool and associated smart phone application will be explored throughout 2017-18.

Funding

Funding for this initiative will be assessed after scoping and concept development is complete.



END-OF-TRIP FACILITIES

Perth CBD

The Perth CBD attracts a large number of cyclists. Workplaces that provide high-quality EOT facilities encourage commuter cycling. To encourage more commuters to cycle, a sufficient level of EOT facilities must be available.

All new buildings in the CBD are required to provide a minimum level of EOT facilities as part of the city's development approval process. However, the facilities provided are sometimes insufficient to meet growing demand or are built in less than ideal locations. Furthermore, many older CBD buildings were developed without the requirement to provide such facilities or with a provision that is insufficient to meet existing and future demand. There is good opportunity to make cycling a more attractive option for many CBD employees.

To address this issue, DoT has identified potential opportunities and mechanisms for increasing the number of EOT facilities in the CBD to better enable central city employees to cycle to work. DoT, in cooperation with the City of Perth, is investigating the preparation of a set of guidelines for EOT provision within new and redeveloped buildings across the CBD.

The aim of the guidelines is to inform developers, employers, site managers and staff about best practices in the supply, management and upgrade of bicycle parking and EOT facilities and services at new commercial and residential developments (and redevelopments).

Consideration is being given to the application of these guidelines throughout the metropolitan area, and in particular activity centres, based on best practice and relevant examples from the CBD.

DoT is exploring the feasibility of public EOT facilities in the Perth CBD. As part of this investigation an EOT inventory for the Perth Parking Management Area has been prepared to identify areas that are poorly served by existing EOT facilities, and to identify potential facility locations.

The EOT inventory has recently been integrated with in City of Perth systems and is maintained by the City.

Activity Centres

EOT facility guidelines for activity centres will be explored with the intent of establishing recommended standards in line with current trends and best practice. These guidelines would suggest appropriate levels of EOT facility provision to ensure future developments within activity centres cater for future demand and trends and may include recommendations for internal areas, external areas, visitors, tenants and open spaces. These guidelines could be used to facilitate discussions related to developments and redevelopments of major shopping centres, hospitals and education facilities.

Related WABN objectives

Objective 3 – Provide a high-quality, interconnected bicycle network

Agencies responsible

DoT (Project Chair)

City of Perth

City of Vincent

Main Roads

Metropolitan Redevelopment Authority

Local government

Stakeholders

Various WABN Implementation Reference Group members

Targets and timelines

Work will be carried out in 2017-18 with the Department of Planning, Lands and Heritage and the City of Perth to determine how best to progress, develop and implement the EOT facility guidelines via the local planning process.

Funding

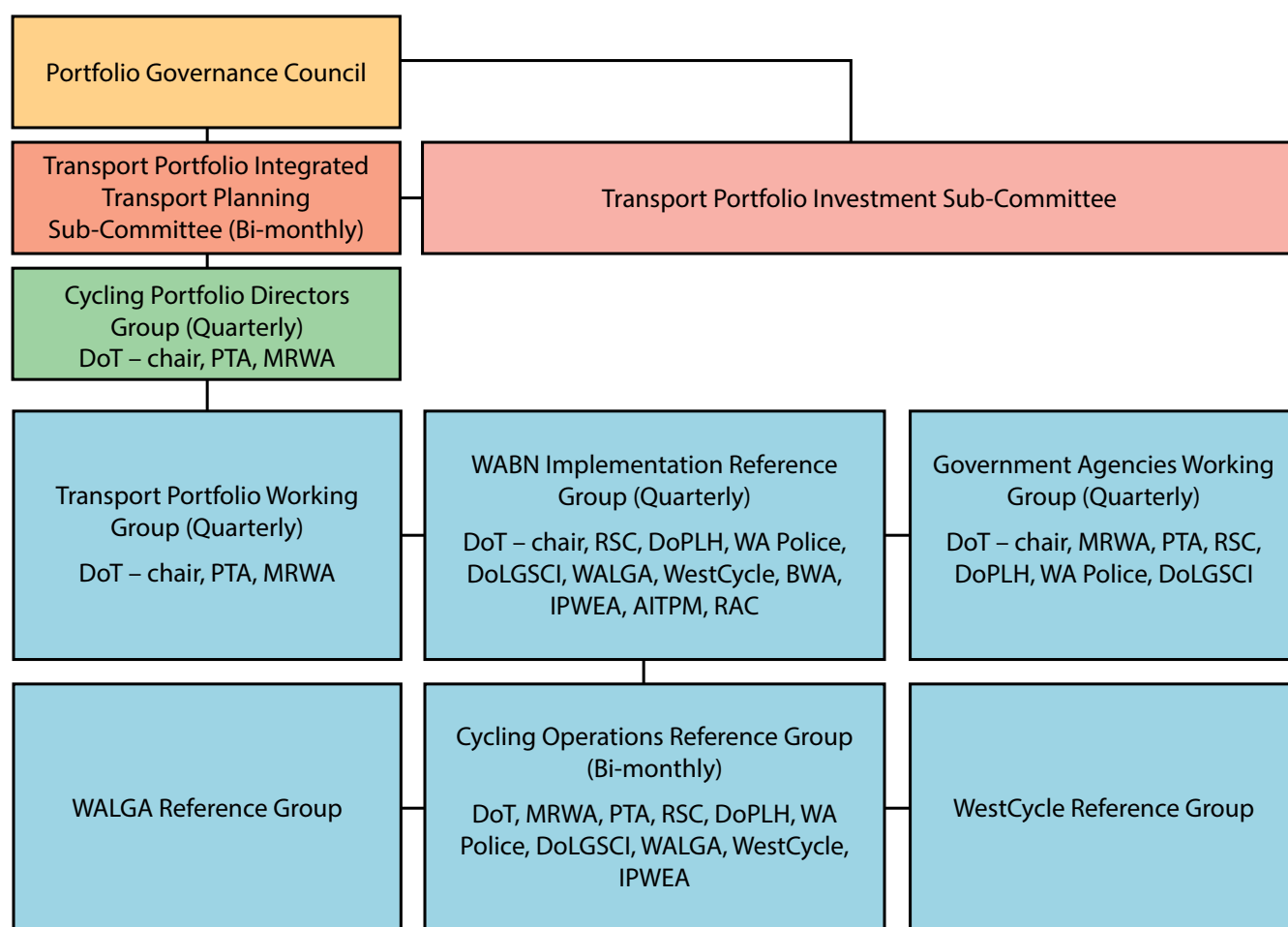
The guidelines will be funded via existing DoT budgets.

IMPLEMENTATION AND GOVERNANCE

The Long-Term Cycle Strategy for Perth will be used to develop an interconnected strategic cycling network for Perth. This network will combine Primary Routes, Secondary Routes and Local Routes with the aim of providing high-quality, safe and connected links between universities, schools, train stations activity centres and tourist destinations across Perth. Similarly the Long-Term Cycle Strategy for Regional WA will perform the same function and will guide future investment in regional WA. These new cycling initiatives will be actioned through the WABN Plan which applies across the State.

The routes and cycling facilities forming the WABN are owned and controlled by a variety of State and local governments. Collaboration between State Government departments, local governments, the private sector and the cycling community is essential to achieve the WABN Plan's vision and objectives. Success will depend on developing positive partnerships, communication and cooperation around a shared vision and objectives. To achieve this, the governance structure identified in Figure 11 has been adopted.

Figure 11. Cycling Governance Structure



Key:

MRWA - Main Roads Western Australia
 RSC - Road Safety Commission
 DoPLH - Department of Planning, Lands and Heritage
 DoLGSCI - Department of Local Government, Sport and Cultural Industries
 WALGA - Western Australian Local Government Association

THE WABN IMPLEMENTATION REFERENCE GROUP

To achieve a coordinated approach in implementing the WABN Plan, given the range of roles and responsibilities of the various organisations involved, the Implementation Reference Group will continue to:

- oversee and monitor the implementation of the key actions of the WABN Plan;
- review strategic bicycle infrastructure items;
- review and provide advice on safety, behavioural, educational and enforcement items; and
- provide a forum for government and non-government agencies to share expertise on cycling projects and policies.

The Implementation Reference Group includes representatives from the following:

- DoT

- Road Safety Commission
- Department of Planning, Lands and Heritage
- Western Australian Police
- Department of Local Government, Sport and Cultural Industries
- Western Australian Local Government Association
- WestCycle
- Bicycling WA
- Institute of Public Work Engineers Australasia
- Australian Institute of Traffic Planning and Management
- RAC WA

DoT will continue to coordinate the Implementation Reference Group, which will meet on a quarterly basis.

Table 6 summarises the lead agency for each WABN Plan action, as well as the support agencies.

Table 4. Actions of the WABN Plan and relevant project

Action	Project Leader	Project Support
Long Term Cycle Strategy for Perth and Regional WA	DoT	Main Roads, PTA, local government, Dept of Biodiversity, Conservation and Attractions
Expansion of the PSP network	DoT	Main Roads
PBN Grants Program	DoT	Local government
RBN Grants Program	DoT	Local government
Perth Central Area Transport Plan Cycling Projects	City of Perth	DoT
Connecting Schools	Local government	DoT
Connecting Stations	PTA	Main Roads, DoT, local government
Planning for bicycle facilities in the regions (Large Cities and Towns)	DoT	Local government
Development of a cycling counting and monitoring strategy	DoT	Main Roads, local government, PTA
EOT Facilities in Perth CBD and Activity Centres	DoT	Local government
Safe Active Streets Program (bike boulevards)	DoT	Main Roads, local government

CYCLING OPERATIONS REFERENCE GROUP

In 2017 the Cycling Operations Reference Group was formed with membership from the following organisations:

- DoT
- Main Roads
- PTA
- Road Safety Commission
- Department of Planning, Lands and Heritage
- WA Police
- Department of Local Government, Sport and Cultural Industries
- Western Australian Local Government Association
- WestCycle
- Institute of Public Works Engineers Australasia

This group will have a strategic focus and meet bi-monthly. Significant items and outcomes from the group will be reported to the Implementation Reference Group.

MONITORING AND REVIEW OF THE WABN PLAN

Monitoring and reviewing the WABN Plan will continue to be an important function in order to ensure it keeps pace with changes in travel and recreational patterns, urban planning and development, and funding options. To achieve this, the WABN Plan will be reviewed on a biennial basis and updated as necessary. Annual reports will also be publicly released.

GOVERNANCE AND AGENCY RESPONSIBILITIES

A coordinated government approach is crucial to the delivery of the WABN Plan. The following outlines the roles and the tasks of the main State Government agencies with cycling-related responsibilities, together with those of local governments and other agencies.

Department of Transport

Role

DoT will continue as the strategic and operational lead and coordinate the activities of all agencies in delivering cycling facilities, distributing grant funding and evaluating its effectiveness in achieving the State Government's cycling objectives.

Tasks

- Support and advise all organisations involved in implementing and maintaining the WABN and encouraging cycling as a mode of transport.
- Define a network of Strategic Bicycle Routes in consultation with Department of Planning, Lands and Heritage, Main Roads, PTA and local government.
- Provide an electronic hazard and Incident reporting system for the public.
- Manage the development of the PSP network, in liaison with Main Roads, PTA and local government.
- Implement the Connecting Schools pilot project, including route planning, auditing, infrastructure development and measurement of behaviour change.





- Monitor and report on bicycle use.
- Provide maps and information for the public.
- Encourage cycling through annual campaigns such as Bike Week and integrate promotion with related health promotion campaigns as well as targeted Your Move programs with a focus on active transport options for students and workplaces.
- Fund infrastructure construction to fill selected gaps in the WABN through PBN and RBN grants.
- Promote the inclusion of cycling facilities in local government road upgrade projects.
- Analysis and reporting of cycling data.

Main Roads Western Australia

Role

Main Roads is responsible for the construction, care and maintenance of the PSP network, all signalised intersections and approving line marking plans for all roads.

Main Roads will continue to be primarily responsible for the PSP network expansion into developing areas as part of highway and freeway extension works. It will also retrofit cycling facilities to existing State controlled roads as part of major upgrades.

Tasks

- Maintain and manage cycling facilities under Main Roads control to appropriate standards.
- Ensure cycling facilities are included in planning for all Main Roads major projects.
- Construct PSPs on at least one side of all new freeway and controlled-access highway projects. The construction of dedicated cycling facilities will also be included on all new road extensions and major upgrade projects on SBRs in metropolitan areas.
- Design and upgrade the PSP network in line with the construction priority developed by DoT.
- Install fixed bicycle counters and collect data.



Public Transport Authority

Role

PTA is primarily responsible for bus and train services and associated infrastructure. This includes building and maintaining sections of PSPs through railway station precincts when rail stations are constructed or upgraded. The PTA also provides secure bicycle parking and supports improved railway station accessibility. Integrating cycling with public transport offers significant opportunities for improving passenger access and responding to increased public transport demand.

Tasks

- Maintain all new PSPs through station precincts.
- Ensure cycling facilities are included in planning for all PTA major projects.
- Install and promote secure bicycle parking facilities at suburban railway stations and monitor their use.
- Construct PSPs through station precincts as part of new station upgrades and in accordance with the PTAs policy and standards.
- Include PSP construction above ground on railway extensions.
- Ensure the safety and use of bicycles is not compromised by vehicle access to car parks, bus lanes and bus priority measures.
- Facilitate planning for bicycle routes accessing railway stations.
- Continue to integrate cycling into Transperth journey planning publicity material.
- Include and address cycling issues in PTA strategic plans.

Department of Planning, Lands and Heritage

Role

The Department of Planning, Lands and Heritage through the Western Australian Planning Commission, is the authority responsible for subdivision planning approval and for significant development proposals throughout WA. It is responsible for land use planning which considers bicycle facilities in road reserves and elsewhere, such as river foreshores.

Tasks

- In consultation with DoT, ensure that a bicycle network is incorporated into sub-regional growth management strategies, structure plans and local planning strategies.
- Refer planning strategies, plans, studies and development proposals to DoT for comment.
- Apply designs for the Movement Network element of Liveable Neighbourhoods to the development and assessment of all new urban developments.
- Support DoT in the development of policies requiring inclusion of EOT facilities in all significant developments.
- Ensure the WABNs existing and future routes and facilities are included in growth management strategies, structure plans and local planning strategies.

Local Government

Role

Local governments are vital to network delivery, ensuring accessibility and responding to local needs. With State Government support, local governments will continue to be responsible for providing and maintaining local bicycle facilities. DoT will continue to work with local governments to complete the local bicycle routes network through the PBN and RBN Grants Programs. Priority will go to projects of strategic importance. DoT will continue to work with local governments to expand the local bicycle route network into newly developed areas which do not have such routes.

Tasks

- Manage and maintain local cycling facilities to appropriate standards.
- Complete and maintain local bicycle plans and ensure that they integrate with the WABN Plan and neighbouring local government's plans.
- Ensure that the design of all roads, parks and other Council facilities include adequate consideration of cyclists.

- Ensure land is set aside along river foreshores for completion of the RSP network.
- Incorporate the requirement to provide EOT facilities in buildings within local government town planning schemes.

Other agencies

Other specific infrastructure on private or publicly owned land may be the responsibility of the asset owner. This may include park agencies as well as the Department of Biodiversity, Conservation and Attractions, and where this occurs DoT will work with the asset owners and any support agencies to advance route planning projects.



SUPPLEMENTARY INFORMATION

Long-Term Cycle Strategy for Perth

The Long-Term Cycle Strategy for Perth will outline measures to achieve an interconnected bicycle network with high-quality links between Perth's various universities, schools, train stations, activity centres and tourist destinations. It will acknowledge the increasingly important role cycling will play in reducing congestion and places emphasis on providing safe, direct and comfortable cycling facilities.

As population increases, walking and cycling can play a big part in helping to reduce congestion, improve air quality and encourage more people to live a healthy, active lifestyle. To facilitate this, the following is proposed:

- Completing the PSP cycling network to provide fast and direct commuting routes parallel to high-speed corridors;
- Filling gaps in the existing cycle network;
- Expanding the cycle network;

- Separating cyclists from motorised vehicles and pedestrians; and
- Providing new river and lake crossings that accommodate active transport (shown on Figure 6).

To realise Perth's potential as a great cycling city, significant investment is required to make the streets both safe and attractive for cyclists. The strategy will highlight the value of providing a comprehensive network of protected cycle lanes that provide safe, legible access to office buildings, shops and tourist attractions.

To complete the strategy the Department will be consulting with the local government agencies over the next two years to agree the network at a council level.



Cycling network hierarchy

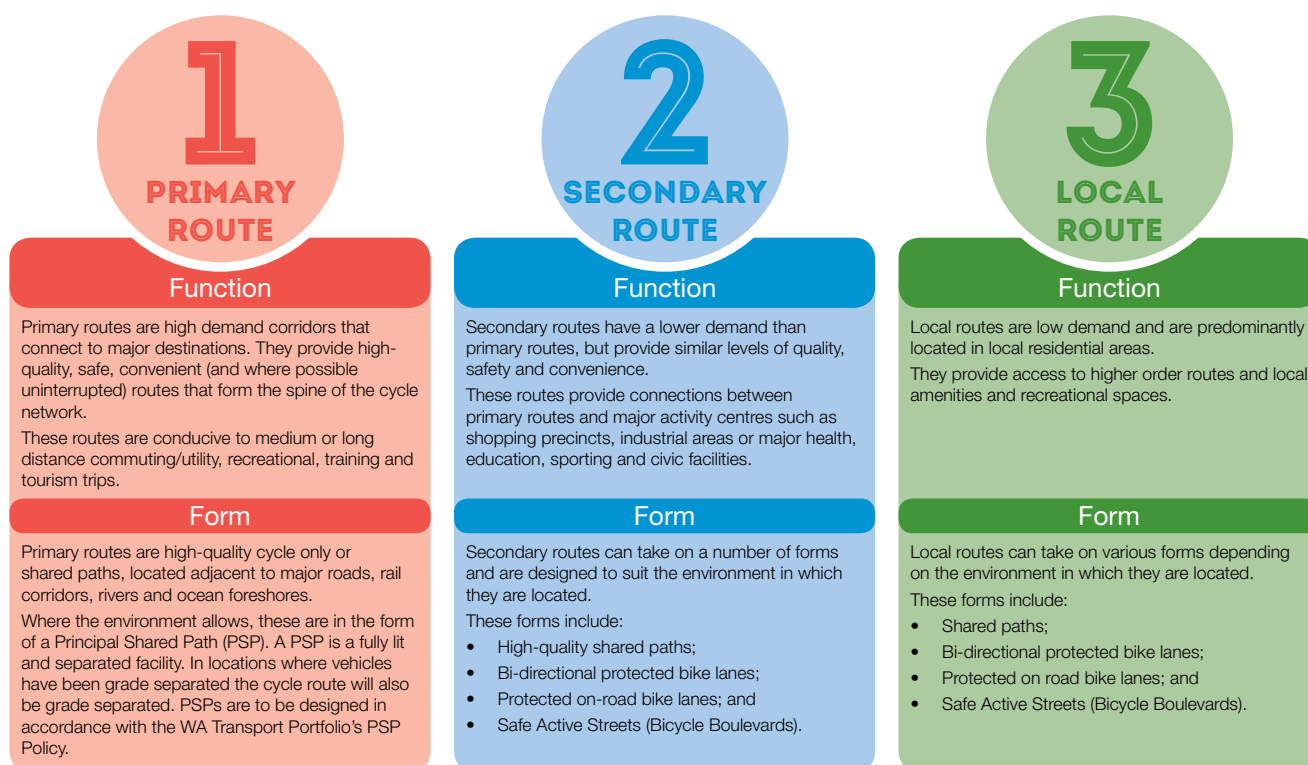
The route hierarchy in table 5 was created to guide the planning and to assist with the classifications systems for The Long-Term Cycle Strategy for Perth and Regional WA.

The proposed network will officially consist of PSPs, RSPs, strategic routes and local routes. A summary of each of the routes within the hierarchy is given below.

Table 5. Cycling infrastructure hierarchy

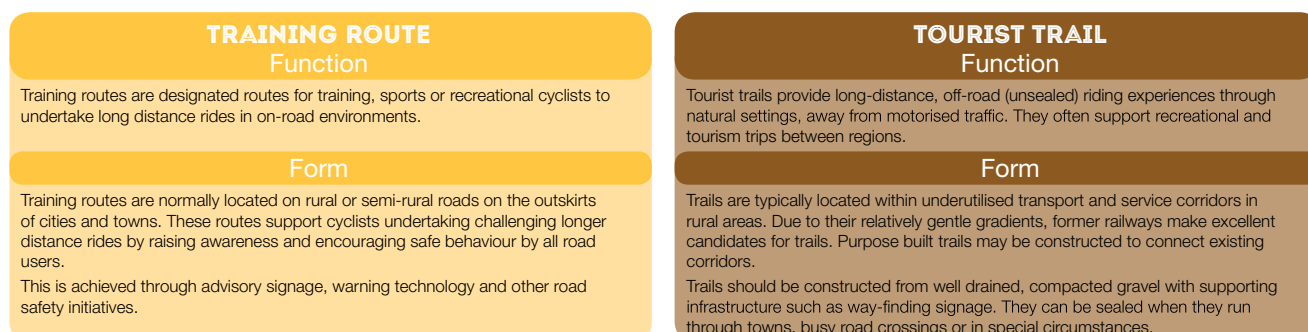
NETWORK PRINCIPALS

The Cycling Network Hierarchy is arranged by route function. The function pertains to the type of activities that take place on the route. A routes' built form is based on the physical characteristics of the location. Each form, apart from those supporting training routes, is designed for the 8 to 80 user group.



COMPLEMENTARY NETWORK

While not all areas will include Tourist Trails and Training Routes, they play an important part in the overall network. These routes are typically used by smaller and more select user groups for recreational purposes.



Dedicated cycling infrastructure - five typologies of route						
		Primary Routes	Secondary Routes	Local Routes	Tourist Trials	Road Cycling Routes
Type of trips	Commuting	✓	✓	✓	✗	✗
	Utility	✓	✓	✓	✗	✗
	Recreation	✓	✗	✗	✓	✗
	Touring	✓	✗	✗	✓	✓
	Training	✓	✗	✗	✗	✓
Responsible agencies (planning, delivery and support):		Department of Transport, Main Roads, Public Transport Authority, Local Government	Department of Transport, Main Roads, Local Government	Department of Transport, Main Roads, Local Government	Department of Biodiversity, Conservation and Attractions, Local Government, Public Transport Authority, Department of Transport, Department of Local Government, Sport and Cultural Industries, LotteryWest Main Roads,	Department of Local Government, Sport and Cultural Industries, Road Safety Commission, Department of Transport, Main Roads, Local Government
Infrastructure should be designed for:		The 8 to 80 user group	The 8 to 80 user group	The 8 to 80 user group	The 8 to 80 user group	Confident cyclists

PRIORITY PSP PROGRAM TO 2023

Since the release of the WABN Plan in 2014, a number of PSP projects have been completed.

These projects include:

- Fremantle Line PSP - Shenton Park to Loch Street
- Kwinana Freeway PSP – Scandrett Way to London Way
- Kwinana Freeway PSP – Mill Point Road to Thelma Street
- Mitchell Freeway PSP – Erindale Road to Balcatta Road
- Midland Line PSP – Bassendean Station to Lord Street
- Midland Line PSP – Guildford Bridge/Railway Parade
- Midland Line PSP – Lord Street underpass
- Midland Line PSP – Guildford Station to East Street
- Midland Line PSP – East Street to Morrison Road

As part of the Malaga Drive interchange upgrade and Gateway WA project around Perth Airport, new PSP connections have also been delivered along the Reid, Leach, Roe and Tonkin Highways.

Project still to be completed are:

Glendalough to Balcatta along the Mitchell Freeway

The existing PSP along Mitchell Freeway is located on the eastern side of the freeway from Perth to Glendalough Station. From this point up to Reid Highway, the existing PSP crosses the freeway at Glendalough Station, Hutton Street and the Hertha Road Overpass.

The route also requires a number of busy at-grade road crossings to be negotiated including Hutton Street, Cedric Street and Karrinyup Road, which lead to significant delays due to wait times at traffic signals and uncontrolled crossings. Several sections of the existing path are constructed from concrete and are in poor condition. Consequently, cyclist numbers on this section of path are less than half those for a comparable PSP section on Kwinana Freeway, despite a larger residential catchment surrounding the Mitchell Freeway.

The intention is to extend the PSP from Glendalough Station on the eastern side of the freeway through to the existing underpass on the eastern side of the freeway beneath Erindale Road. The PSP will then cross to the western side of the freeway to the current PSP. The improvements will involve grade separation works to provide a safe, efficient, uninterrupted PSP and will be delivered in stages.

This will require several new structures between Glendalough Station and Hutton Street and an underpass at Karrinyup Road. Additionally, extensive retaining walls will be needed at a number of locations. A new path will be constructed between Glendalough Station (Scarborough Beach Road) and Hutton Street. The section of path between the Hertha Road Overpass and Karrinyup Road will be replaced and new PSP sections will be built to fill the missing links between Civic Place and Erindale road, and Erindale Road and Reid Highway. No provision has been made for structures beneath Cedric Street due to infrastructure timeframe requirements for the Stirling Regional Centre being unclear at this stage. This situation will be reviewed as planning for the area evolves. However the grade-separated facility at Cedric Street will be signalised to improve connectivity and safety.

Grant Street to North Fremantle along the Perth–Fremantle Line

The existing PSP from Perth finishes at the Grant Street Station in Cottesloe. From this point to Fremantle cyclists are required to travel on-road in sealed shoulders and through signalised intersections that do not have provisions for cyclists. The first stage of the PSP extension will continue through to Jarrad Street just south of Cottesloe Station. The second stage will continue to Victoria Street. Stage one and two will be delivered together. The full completion of the PSP south of this point is unlikely to be achieved within the first stage ten-year timeframe for the WABN Plan. However, opportunities will be taken to include PSPs in the planning for other projects such as the replacement of the Fremantle Traffic Bridge at Curtin Avenue. The construction timing of such projects will then influence further stages of the PSP extension.

Cranford Avenue along Kwinana Freeway

The existing PSP along Kwinana Freeway crosses Cranford Avenue at grade.

This is the only at-grade (where there is a clash between cycling and other forms of transport) road crossing for the entire Kwinana Freeway PSP and presents a safety concern. There is a missing section of PSP between Cranford Avenue and Leach Highway. This improvement project involves construction of a grade-separated PSP from the north side of Cranford Avenue to the existing PSP connection on Selway Road.

Thelma Street to Mount Henry Bridge along the Kwinana Freeway (upgrade to existing path)

An existing PSP has been in place along this section of Kwinana Freeway for a number of decades. Since construction of the path, the number of cyclists and pedestrians using it has increased considerably. The number of bicycle movements on the PSP on the west side of the Narrows Bridge has been as high as 3420 per day for a normal work day, with approximately 2000 bicycle movements recorded on an average work day in 2012. This very high usage results in conflict between opposing flows of cyclists and also with pedestrians.

There is insufficient width to construct separate pedestrian and bicycle facilities due to the site constraints which include the river, the freeway and the need to retain remnant vegetation.

This improvement project will involve removing the unnecessary bends in the path to improve the sightlines. The path will also be resealed to replace the existing surface and the bitumen-stabilised shoulders and widened where possible.

Burswood to William Street along the Perth-Armadale Line

The existing PSP runs along Graham Farmer Freeway and terminates at Great Eastern Highway. From this point eastwards, the most direct route south-eastwards is Rutland Avenue a recently constructed PSP that runs along the Armadale Line from Welshpool Road to Lacey Street, with the next section on the route planned for implementation being between Lacey Street and William Street.

This improvement project involves the planning and construction of an appropriate bicycle facility from Riversdale Road in Burswood through to Welshpool Road. This corridor is particularly challenging due to the railway being in cut and the reserve being relatively narrow; however, Rutland Parade will be used in some sections as a staged option for the development of this route. Design work for the section south of Oats Street has commenced with the most cost-effective option yet to be determined. This is a protected bi-directional on-road facility.

Other projects

Between 2017 and 2023 several PSP links will be funded and constructed as part of other transport infrastructure projects. This includes the NorthLink WA and Murdoch Road Extension projects.



Figure 12. Principal Shared Path Projects to 2023 - Perth and surrounds



PSP PROGRAM 2023-2031

The priority PSP Program through to 2023 will complete almost all PSP links within a 15 km radius of the Perth CBD. The intention of the 2023-2031 Program will be to complete the entire PSP network as far north as Yanchep, as far south as Rockingham and from Fremantle in the west to Midland and Armadale in the east. These projects will be programmed and completed in conjunction with other major funded transport projects.

The 2023-2031 program includes:

Mitchell Freeway PSP

- Upgrade and construction of a PSP between Reid Highway and Ocean Reef Road.
- Construction of PSP's with the Mitchell Freeway extensions.
- Construction of a PSP with the northern railway line extension to Yanchep.

Kwinana Freeway PSP

- Construction of a PSP link from the Kwinana Freeway into and out of Rockingham.
- Completion of a PSP from Selway Road, under Cranford Avenue and connecting into the Mount Henry Bridge.
- Upgrade the existing PSP from Sea Scout Hall to Mount Henry Bridge.

Perth to Midland PSP

- Completion of a PSP link between Morrison Road and the Roe Highway PSP as part of METRONET.
- Swan River crossing connecting Guildford Station to Success Station.

Perth to Armadale PSP

- Construction of a PSP on Railway Parade from Lacey Street to Ladywell Street.
- Construction of a PSP along the Armadale Line from Kelvin Road to Armadale Road.

Perth to Fremantle PSP

- Construction of a PSP from North Fremantle Station to Fremantle which will complete the Perth to Fremantle PSP route.

Reid Highway PSP

- Completion of the missing PSP link along Reid Highway between Wanneroo Road and Mirrabooka Avenue.
- Construction of a PSP on Reid Highway between West Swan Road and Roe Highway.
- Construction of a PSP between West Swan Road and the Swan River.
- Construction of a PSP between Marmion Avenue and Everingham Street.

Roe Highway PSP

- Construction of the missing PSP between Great Northern Highway and Morrison Road.
- Construction of the missing links of PSP to tie in with grade separation projects between Great Northern Highway, Great Eastern Highway, Great Eastern Highway Bypass, Kalamunda Road and Berkshire Road.

Tonkin Highway PSP

- Construction of the missing PSP link between Gateway WA and Mills Road West.
- Construction of a PSP with road upgrade on Tonkin Highway from Thomas Road to Mundijong Road.

Other

- Upgrade of the South Fremantle recreational shared path to PSP standard and linking this to Stock Road via the freight rail corridor
- Construction of a PSP along Stock Road, from the freight rail corridor to Cockburn Road
- Construction of a PSP along Thomas Street / Winthrop Avenue, connecting the existing Perth to Fremantle PSP to UWA at Stirling Highway.

Figure 13. Principal Shared Path Projects 2023-2031 - Perth and Peel



CYCLING IN THE PERTH CBD

City of Perth Cycle Plan 2029

The *City of Perth Cycle Plan 2029* was developed to support the thousands of people currently cycling to and through the city, and to encourage others to take up cycling. The Plan was adopted by the Council in 2012 and is a positive step towards creating a more bicycle-friendly city.

The goal of the Plan is to ensure cyclists of varying abilities have access to an integrated, accessible and safe strategic cycle network. It also aims to have an informed community that participate in cycling and both acknowledge and appreciate the environmental, economic and social benefits that cycling provides.

The Plan is supported by a five year implementation program that is updated bi-annually. Key project locations identified in the 2016-2021 program include Murray Street west of Elder Street, Kings Park Road, Thomas Street/Winthrop Avenue, Milligan Street and Colin Street.

City of Perth Integrated Transport Strategy

The *City of Perth Transport Strategy* was released in late 2016. The Strategy sets out the Council's long-term aspirations for transport and is supported by a four year implementation plan which lists specific actions.

The Strategy recognises the City's critical role in providing cycling infrastructure and outlines the following objectives:

- Continue to develop a connected cycling network;
- Lead and promote the development of high-quality EOT cycling facilities in the City of Perth; and
- Be a leader in the development of innovative cycling infrastructure and support innovation that helps Perth become a more cyclefriendly city.

The Strategy identifies the City's preferred strategic cycle network, highlighting key east-west and north-south connections into the CBD from the peripheral shared path network. The Strategy includes an action to update the existing Cycle Plan 2029 and importantly, recognises the need to include provision for separated cycling infrastructure in the City.

The Strategy builds on the themes and ideas set out in the Council's *Strategic Community Plan - Vision 2029+* and will continue to inform future transport strategic and operational documents.

Figure 14 - City of Perth proposed bicycle routes



Source: [City of Perth website](#)

Major civic projects

There are a number of major civic projects currently underway in or on the fringe of the Perth CBD, including Perth City Link, Riverside and the new Perth Stadium at Burswood. These projects provide both opportunities and challenges for the bicycle network.

Perth City Link

The Perth City Link project connects the city centre with Northbridge for the first time in more than 100 years. The project site extends from the Perth Arena to Perth Station and has involved the sinking of the Fremantle Line and the construction of the new underground Perth Busport.

King and Queen Street are being constructed at grade between Wellington and Roe Streets, giving cyclists two options for connecting between the CBD and Northbridge.

A dedicated cycle path has been constructed along the northern side of Wellington Street, connecting Elder Street through to William Street. In the future, this will connect to existing cycle facilities on Barrack Street.

The shared path on Roe will be upgraded between Barrack Street Bridge and Milligan Street, linking into the newly constructed shared path which extends west through to Thomas Street.

Riverside

Located east of the Swan River, bordered by Adelaide Terrace and the Causeway to the south, the Riverside project will create a community and tourist destination with a range of entertainment, commercial, retail, civic and residential uses.

There is an opportunity for this precinct to be an attractive cycling origin and destination, and not just a through route. High-quality bicycle parking and EOT facilities will help support this. New and upgraded cycling infrastructure will be provided as part of the development.

Perth Stadium and Sports Precinct

The Perth Stadium and Sports Precinct will be an entry statement to the city. Located on Burswood Peninsula adjacent to Graham Farmer Freeway, Perth Stadium will be a world-class sporting and entertaining venue capable of attracting national and international events to Perth.

As part of the development, a new shared pedestrian and cycling bridge is currently under construction, providing a new link across the Swan River and into East Perth. On the other side of the Burswood Peninsular, Racecourse Bridge is a long-term future connection which, when coupled with the Stadium Bridge, would provide a significant shortcut for cyclists between Maylands and the CBD.

Limitations to vehicle movements through the Perth Stadium Sports Precinct will increase safety and improve amenity for pedestrians and cyclists.

Approximately 600 bicycle parking spaces will be provided to support an expected high cycling demand. On event days there will be high pedestrian numbers which will effect cycling level of service, particularly across the Stadium Bridge.

SAFE ACTIVE STREETS PROGRAM (BIKE BOULEVARDS)

Safe active streets encourage more people to cycle by creating slower speed environments that connect to the wider bicycle network and give cyclists a greater share of the street. Safe active streets are clearly marked routes (with specific pavement markings and signs) where intersections are designed to reduce the need for cyclists to stop frequently and are much safer for cyclists to cross major roads. The markings highlight that there are cyclists in the area and that road users need to share the road safely.

Safe active streets offer a safer and more pleasant cycling experience with vehicle speeds reduced to 30km/h. Various measures may be used to slow traffic, discourage through-travel by cars, and improve bike flow.

DoT initiated the Safe Active Streets Program with a goal to plan, design and construct three safe active street demonstration projects. All three streets run parallel to busy arterial roads. The projects also aim to provide safer crossings where each boulevard intersects major roads.

City of Vincent – Shakespeare Street Bike Boulevard - complete

The Shakespeare Street Bike Boulevard runs 1 km from Green Street to Scarborough Beach Road. The width of the road was reduced from 7 to 5 m, to be shared between cyclists and slow-moving vehicles. The remaining 2.3 m was retained for parking. Single lane slow points (3 m in width) are provided at regular intervals along the length of the boulevard. Intersection priority has been reversed at Hobart Street and Ellesmere Street, which means that cyclists only have to stop once along the entire route.

Stage one of the Shakespeare Street Bike Boulevard was completed in December 2016. Planning and design for stage two of Shakespeare Street is currently underway.

City of Bayswater – Leake Street and May Street Bike Boulevard

Stage one of the Leake Street and May Street Bike Boulevard was completed in June 2017 and runs between Adelphi Street and Railway Parade (approximately 2.5 km). Similar to the Shakespeare Street project, the road width has been reduced from 7 to 4 m, and is shared between cyclists and motorists. Single lane slow points are provided with traffic calming measures at regular intervals along the length of the route.

City of Belmont – Surrey Road Bike Boulevard

The Surrey Road project will run for 4 km from Leach Highway to Great Eastern Highway. Generally, the shared road space is 5 m wide with 3.2 m parking bays provided along the length of the street. Slow points with traffic calming measures will be constructed at regular intervals.

In addition to the pilot projects above, DoT has commenced work with a number of other local authorities on the planning and design of safe active streets.

ACRONYMS

ABS	Australian Bureau of Statistics
PCA	Perth Central Area
CBD	Central Business District
COAG	Council of Australian Governments
CORG	Cycling Operations Reference Group
DoT	Department of Transport
EOT	End-of-trip
IPWEA	Institute of Public Works Engineering Australasia
LBRs	Local Bicycle Routes
MRA	Metropolitan Redevelopment Authority
NCS	National Cycling Strategy
PTA	Public Transport Authority
PBN	Perth Bicycle Network
PCP	Principal Cycling Paths
PSP	Principal Shared Path
RBN	Regional Bicycle Network
RAC	Royal Automobile Club
RSP	Recreational Shared Path
SBRs	Strategic Bicycle Routes
WA	Western Australia
WAPC	Western Australian Planning Commission
WABN	Western Australian Bicycle Network
WALGA	WA Local Government Association

CONTACT

Department of Transport
140 William Street
Perth WA 6000
Telephone: (08) 6551 6000
Website: www.transport.wa.gov.au

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Department of
Transport

2015 Cycling Imagineering Workshop Report



Detailed Cycling Imagineering Workshop Report

Prepared for Department of Transport

Prepared by Craig Wooldridge, Director Network Planning Moving People

Date May 2015

Objective number

Version control

Version No.	Date	Prepared by	Revision or issue description	Issued to

Amendment record

This guidelines document is reviewed to ensure its continuing relevance to the systems and process that it describes. A record of contextual revisions is listed in the following table.

Page No.	Context	Revision	Date

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Introduction

From 15 to 18 March 2015, the Department of Transport and the RAC hosted a visit by two expert Dutch Cycle Planners/Designers for the purpose of exploring innovative cycling solutions for Perth and Regional Cities/Town. The visit emanated from a cycling study tour of the Netherlands in 2014 in which the Department of Transport participated.

The two Dutch experts were:

- Martijn J. te Lintelo (City of Nijmegen-Local Government)
- Arie Vijfhuizen (Royal Haskoning DHV-Private Sector)

Martijn and Arie have extensive experience in planning and designing for bicycles, traffic engineering, road safety, traffic management and integrated spatial planning.

The visit consisted of three planning days and a full day Imagineering Workshop. The planning days provided the Dutch experts with an overview of the Perth context and an opportunity to experience Perth as a cyclist as well as site visits to a number of example roads. This element was critical to ensuring that Arie and Martijn built a good background on the key issues and challenges.

Prior to the workshop, a presentation session was arranged for the participants to provide a background to the Dutch approach for cycle planning and design. A copy of the presentations can be obtained at <http://www.transport.wa.gov.au/imagineering>



The workshop was an invitation-only event to ensure that a broad range of people involved in cycling were represented. Indicating the level of importance of the workshop, the opening included the Minister for Transport and the Dutch Consul General. The Minister's opening remarks highlighted the range of cyclists that needed to be catered for including: commuters, recreational riders and high-speed training cyclists.

The Dutch Consul General provided an overview of the Dutch cycling history and the passion that Dutch professionals have for sharing cycling knowledge. An emphasis was placed on making the most of the 40 years of learnings that the Dutch have obtained since re-embracing cycling as a true transport mode.

The opening concluded with a challenge to the participants to put existing policies and standards to one side and take an open eyes and ears approach to the day. In this way, we could imagine what might be possible by focusing on creating a safe and connected network, while also considering the needs of the other transport modes.

A total of 140 people attended the workshop from state/local government, private sector transport planners/traffic engineers/urban planners, academics, advocacy groups and individual advocates.

The workshop had a focus on five key areas to assist with the ongoing development of a number of key initiatives within the Western Australian Bicycle Network Plan:

- Local Roads
- Arterial Roads
- Connections to Schools
- Connection to rail stations and hospitals
- Roundabouts.

Each focus group had a range of real example roads with a full background package for each and was allocated 90 minutes to work up options for their allocated example.

The selection of the example projects was based on the need to assess a range of diverse examples, the opportunity that the projects offered for future demonstration projects and the value of influencing future projects in a similar environment.

The key outcomes for each focus area are detailed below.



Workshop Themes

Local Roads

The Western Australian Bicycle Network Plan (WABN) has a key item that involves the review of local bike routes, and the local roads component of the workshop tied in very well with this initiative. Close to half of the cycling crashes that involve a serious or fatal injury occur on 50km/h local roads and there is significant scope to address this situation.

The main findings and options put forward for local roads include:

- Long local roads could be disconnected with midblock or tail end closures to move motorised traffic to the higher order roads sooner. This would result in lower volumes on local roads and a safer environment for cyclists and also pedestrians. In this environment inappropriate roundabouts could be removed to reduce crashes involving cars and cyclists;
- Bike boulevards should be planned and implemented as demonstration projects with before and after studies;
- Where separation is not an option, operating speeds should be reduced to 30km/h through reengineering the street environment;
- There needs to be a clear difference between the lowest order, preferably 30km/h roads, and the 50km/h roads. This needs to be achieved via road design options and a logical road hierarchy (self explaining roads principles);
- There needs to be a network approach taken when planning local road networks for developments within established areas (brownfield sites) and new suburbs on the metropolitan fringe (greenfield sites). This needs to take in the requirements of all modes, while having a strong focus on road safety. Too often we look at an isolated intersection or road links and end up retrofitting inappropriate options that do not always end up achieving the intended aims. The case in point is the over use of roundabouts, when other network wide options are available.
- Community engagement is critical to ensure that two way information is exchanged, examined and understood, rather than putting ideas down without knowledge;
- Cycle routes must have priority for bikes and this may require re-orientation of stop/giveway signs and the addition of disconnects in the link to reduce motorised traffic;
- On-street parking needs to be taken into account when developing options. There needs to be a review of the need for existing parking and a review of the risks of cars parking over cycling facilities in higher density areas; and
- High speed training circuits need to be identified, mapped and considered when local area traffic management is being planned.

Arterial Roads

Arterial Roads were next on the agenda, and this is one of the most challenging areas for cycling.

In Perth, we have generally catered for cyclists on arterial roads with a sealed shoulder for commuting and high speed training and a shared path for recreational cycling. This approach has been utilised for about 15 years and has largely resulted in facilities that have very little use.

The level of protection in the sealed shoulder is fairly low with a painted edge line and there are also high conflict areas at intersections, particularly with vehicles crossing into left turn lanes. Road debris is also frequently swept into the shoulders of arterial roads, thereby creating a hazard for cyclists. On older roads with no cycling facilities, it is often an environment that provides a very low level of safety. As

such, most arterial roads are generally travelled by males and even then, mostly dedicated cyclists (such as competitive cyclists and MAMLS).

The main ideas put forward for arterial roads were as follows:

- The first priority should be to find an alternative route on the local road network one block back and the local network could be redesigned to create a bike boulevard. This approach provides a far safer outcome in a more pleasant environment;
- If an alternative route is not available a fully separated facility needs to be provided. This does provide challenges as priority through intersections is problematic, but options could be developed; and
- Consider the origins and destinations to determine if there is a cycling demand along the arterial road route.



Connections to Schools

The connections to schools area has been a focus for the Perth Bicycle Network Grants for the past two years and is an area where innovation and options need to be developed to build upon low cycling numbers. The main ideas put forward were as follows:

- The options developed for the local roads theme are highly applicable to connections to schools;
- 40km/h school zones can be ineffective if speed compliance is reliant on enforcement, the roads surrounding the school need to be redesigned to encourage slower speeds and safety for children at all times;

- Develop fine grain connection to school routes that cater for cycling within a 1.5km radius of the schools;
- Provide a focus on safe intersection crossings;
- Survey students and parents to determine what the barriers are;
- Bike education in schools is a good initiative to get kids cycling safely with broader road safety learnings being a bonus;
- Educate the parents;
- Provide secure end of trip facilities;
- Discourage car use and improve mode separation in close proximity to the school;
- Change the regulations to allow people of all ages to cycle on footpaths (parents and grandparents); and
- Make cycle routes to school fun with on-path signage and good way finding.

Connections to Stations

The connections to rail stations is a key initiative of the WABN and aims to improve cycling within a 3km radius of the station along with secure end of trip facilities. The main ideas put forward were as follows:

- The options developed for the local roads theme are highly applicable to connections to stations;
- A fine grain network feeding into stations is needed;
- Connectivity within the station precinct is just as important as the lead ins;
- Any cycling facilities provided must be continuous;
- Develop colour coded routes;
- High standard lighting is needed; and
- Consider links between stations and high schools.

Connections to Hospitals

Connections to hospitals is a new topic and is clearly needed due to a strong focus on the expansion of existing hospitals and construction of new hospitals in Perth in recent years. Two hospital examples were selected: the recently opened Fiona Stanley in Murdoch and the QEII precinct in Nedlands that is being expanded at present. The following ideas were developed:

- The options developed for the local roads theme are highly applicable to connections to hospitals;
- A focus is required on linking with other origins and destinations via common routes to maximise the cycling opportunities and minimise duplication of infrastructure;
- Options within the hospital boundaries need to be considered to provide door to door options;
- Consideration of separation of cyclists and pedestrians within the precinct needs to be part of the planning;
- Links to the higher order shared paths are important;
- Some of the car parking may need to be modified to provide a more direct and safer route for cyclists, particularly connecting end of trip facilities;
- End of trip facilities need to be planned and integrated into the hospital;
- Grade separations are likely to be required for crossing high volume arterial roads that surround the hospital sites;
- On road parallel parking could be removed to provide a separated cycling facility in close proximity to the hospitals;
- Cycling must be considered in the early planning for hospital sites;
- There are good options to link surrounding activities such as universities including bike share schemes; and

- Way finding is required.

Roundabouts

The last topic covered was roundabouts, which have been reviewed many times over the past two decades to find solutions to safely accommodate cyclists. Single lane roundabouts have been covered to some degree in the local roads area, but there are still situations where a single roundabout is appropriate and cycling requirements need to be taken into account. Dual lane roundabouts present the biggest challenge in terms of safety for cyclists.



The following options were developed:

- Question if other treatments such as priority control or traffic signals are more appropriate; and
- For high volume dual lane roundabouts the only safe option for cyclists and pedestrians is grade separation of the crossings.
- For single lane roundabouts, the approach speed needs to be reduced with devices such as a raised plateau for both motorised traffic and cyclists;
- Roundabouts at a tee junction with cycle lanes on approach and departure to the non-conflict legs can have a free flow cycle lane but protection needs to be provided via kerbing to prevent motorised traffic cutting into the cycle lane;
- For dual lane roundabouts the only safe option is to create an off road cycle bypass. The appropriateness of the route also needs to be questioned and consideration given to whether a parallel alternative route is available;
- Consider the option of providing priority for cyclists at the roundabout crossing with a similar approach to the Dutch with giveway treatments for motorised traffic, as per the below picture:

Dutch Roundabout with priority for cyclists



Source: <https://bicycledutch.wordpress.com/2013/05/09/a-modern-amsterdam-roundabout/>

- Modify dual lane roundabouts to keep motorised traffic in their lanes with physical separation;
- For large, high speed roundabouts, trial a turbo roundabout with a grade separated cyclist bypass, which will reduce the number conflict points as opposed to a concentric roundabout, as it is impossible to change direction once the driver is inside the roundabout. See below:

Dual Lane Turbo Roundabout



Progressing the Workshop Outcomes

A significant amount of ideas were put forward throughout the workshop and an outcomes and action plan has been developed as per the table below. As the actions progress, input and feedback will be sought from the Western Australian Bicycle Network Plan Implementation Reference Group.

Action Item	Lead Agency	Partner Agencies / Bodies	Timeframes
Develop and implement demonstration low speed bike boulevards, low speed precincts, connections to stations/schools and hospitals	DoT	Main Roads, PTA, WALGA, LGA's, Department of Education, Health Department, WABN IRG-Sub Group	Commence planning immediately and run for a three year period before converting to an ongoing grants program with dollar for dollar contributions
Review of Main Roads and Public Transport Authority (PTA) Cycling Policies	Main Roads, PTA	DoT, WALGA	Commence in mid 2015 with drafts being available for consultation by the end of 2015.
Review of cycling requirements for major road extension projects and road improvement projects	Main Roads	DoT, PTA, WALGA	Commence in mid 2015 with drafts being available for consultation by the end of 2015. Final versions to be available by June 2016.
Review of cyclist/pedestrian conflicts on the PSP network within a 5km radius of the Perth CBD and at high patronage train stations that interface with the PSP network.	DoT	Main Roads, PTA, Inner City LGA's	Start in early 2016 with a discussion paper being available for consultation in early 2017
Review the width requirements for the planning of new PSP's and maintenance of existing PSP's	DoT	Main Roads	Start in mid 2015 with a discussion paper being available for consultation in mid 2016
Consider allowing cycling two abreast on shared paths if sufficient width is available and removing the age restriction for cycling on footpaths	ORS	Main Roads, PTA, WALGA, Police	Start review in mid 2015 with regulations being modified by mid 2016 if agreed.

Action Item	Lead Agency	Partner Agencies / Bodies	Timeframes
Review of standards and guidelines, including but not limited to: <ul style="list-style-type: none"> • Roundabouts • Lane widths on local roads • Signage/way finding 	Main Roads	DoT, PTA, WALGA	Start in mid 2016 and conclude in mid 2017
Develop a high level cycling network for Perth at a population of 3.5m	DoT	Main Roads, PTA, WALGA	Start in mid 2015 with a draft due in mid 2016
Identify and map high usage/high speed cycle training circuits and communicate with local government to influence local area traffic management planning	WestCycle	DoT, Main Roads, WALGA	Initial report due in mid 2015 with options development to follow with progressive development until mid 2017
Develop benchmarking options against others states and overseas cities for cycle surveys	RAC	DoT, Main Roads, PTA, WALGA	Options due for consideration by mid 2016
Consider whether cycling education in schools should be made available and how	ORS	Police, DoT, Main Roads, PTA, DoE, WALGA, Advocacy Groups	Discussion paper to be completed for consultation by mid 2016
Consider whether cycling education for adults should be made available and how	ORS	Police, DoT, Main Roads, PTA, WALGA, Advocacy Groups	Discussion paper to be completed for consultation by mid 2016
In tandem with the review of all action items, review the areas of need for potential promotion, education and enforcement options	DoT	DoT, Main Roads, PTA, WALGA, Police, Advocacy Groups	High level review to start in mid 2015 and be completed by late 2016. Ongoing beyond that point.
Develop an option to run a planning and design Masterclass during Bikeweek 2016	DoT	Main Roads, PTA, WALGA, Advocacy Groups	Complete by October 2015

Appendix A-Attendee Organisations

- Department of Transport
- Main Roads
- Public Transport Authority
- Department of Planning
- WA Police
- Health Department
- Auditor General's Office
- Local Government-Traffic and Transport Officers, Travel Smart Officers, Urban Planners and Elected Members
- Western Australian Local Government Association
- Universities
- RAC
- Private Sector Transport Planning, Traffic Engineering and Civil Engineering Consultants
- Private Sector Urban Planners
- Heart Foundation
- Cycling Advocacy Organisations
- Individual Advocates
- Community Based Advocacy Groups

Appendix B-Ideas Developed for Each Example Project

The workshop included twenty-seven examples of roads/precincts across the five focus areas. A summary of the outcomes for each example is contained below. Each outcome will be subject to additional exploration of ideas and engagement with the relevant authorities.

Local Roads

Bayswater Bike Boulevard (Swan River RSP to Morley Strategic Activity Centre)

- Slow motorised traffic down with bike friendly traffic calming;
- Restrict motorised traffic movements at key intersections to reduce traffic volumes;
- Add 2m wide refuge islands at busy road crossings;
- Lawrence Street is proposed (north of Railway Parade), but May Street or The Strand should also be explored;
- Provide plateaus at intersections;
- Provide cyclists with priority at most intersections;
- Review the option to ban on-street parking as wide verges are available. Formalised indented parking in the verge may be possible in the medium term;
- A signalised crossing will be provided on Guildford Road near Leake Street in 2015/16.
- Need to consult with residents;
- Aim for a 30km/h speed limit;
- May require some mid-block cul-de-sacs to reduce motorised traffic;
- Advisory 1.5m bike lanes in each direction, with on-street parking banned and verge parking allowed. In the longer term build indented parking bays; and
- Review the option to ban cars in close proximity to schools with pop up bollards during school drop off and pick up times.

Macrae Road, Applecross

- Remove some local road intersections via cul-de-sacs or reduce to three way intersections (instead of four way) to reduce the flows onto Macrae Street and improve the sight lines at remaining intersections;
- Review the option to cul-de-sac each end of Macrae Road or mid block at Ardross Street to reduce motorised traffic;
- Remove the roundabouts and provide priority to Macrae Road;
- Reduce the speed limit to 30km/h;
- Traffic calm approach roads to be more cyclist friendly; and
- Move motorised traffic onto Canning Highway earlier to reduce rat running.

Rutland Avenue-Welshpool Road to Great Eastern Highway, Lathlain and Carlisle

- Create an alternative on road option until the PSP is constructed;
- Some sections are wide enough to mark a bike lane, while maintaining two way access for motorised traffic;
- For the narrow sections consider changing the road to a bi-direction bike facility and one way for motorised traffic;
- Consider mid block closures at some locations to reduce motorised traffic;
- Possible stage 1-use red/green treatments to create bike lanes, with improved crossing facilities at intersections;
- Possible stage 2-bike boulevard with street parking removed and moved to the verge, bi-directional bike lanes on the rail side of the reserve, grade separation of Oats Street and Archer Street and improve the Goodwood Parade connection from Great Eastern Highway to the Graham Farmer Freeway PSP; and
- Possible stage 3-PSP.

Princess Road, Nedlands

- Consider abandoning as a designated bike route this is only suitable for experienced riders. However, Princess Road is a popular route for cyclists and still requires improvement;
- The 1m wide bike lane is too narrow; consider installing a 2m lane up hill;
- Develop alternative routes such as Melvista Avenue, Elizabeth Street and Edward Street, where motorised traffic volumes are lower and lower speed limits are more achievable;
- Improve intersection treatments; and
- Develop connections to schools routes with low speed limits.

York Street, Albany

- Provide a one way cycle path on each side of a 2m protection zone, 2.3m for car parking, one 3.2m lane for motorised traffic on each direction and a 2m central median;
- Review the option to remove the roundabout at Peels Place;
- Reduce the number of intersections;
- Lower the speed limit;
- Take options out to public consultation with good information on the objectives for the main street; and
- The needs for an aging population, e-bikes and gophers need to be considered.

Scarborough Beach Road-Oxford Street to Loftus Street, Mt Hawthorn

- The road can be reduced to one lane each way for motorised traffic;
- Three options are viable-bi-directional cycle path, separated verge cycle paths or on street cycle lanes; and
- There are opportunities at intersections to create safer crossing facilities.

Glyde Street, Mosman Park

- Provide a bike lantern to the traffic signals at Stirling Highway to allow cyclists to cycle across.
- Add bike ramp to the stairs to the train station;
- Reduce the speed limit on Glyde Street by modifying the road environment to achieve lower operating speeds;
- Add raised plateaus at the intersections with Harvey Street, Palmerston Street and Hope Street; and
- Review the roundabouts - need for and design.

Salvado Road, Floreat and Subiaco

- Provide a direct cycle route along Salvado Road by creating either:
 - a 3.5m wide bi-direction bike facility with a 1m buffer zone to the car parking; or
 - Creating a 30km/h environment by reducing the traffic lane widths and utilizing the following cross section: verge, 1.8m cycle lane, narrow traffic lane, wider median (with crossing opportunities at intersections), narrow traffic lane, 1.8m cycle lane, car parking, verge.
- Other improvements include:
 - Create a safe crossing at the Selby Street intersection;
 - Redirect motorised traffic to Underwood Avenue/Hay Street and Cambridge Street; and
 - Extend the red phases at the Selby Street signalised intersections with Cambridge Street and Hay Street to create gaps for cyclists to cross at the Salvado Road intersection.

Cathedral Avenue, Geraldton

- Propose to remove on street parking to provide space for cycling facilities. This will require consultation;
- A preferred outcome is to achieve protected bike lanes in each direction;
- Lower speed limits;
- Discourage or ban through traffic from Marine Terrace to the Foreshore to enable a shared zone to be established. This may need traffic calming to achieve the outcome; and
- Review end of trip requirements for new developments.

Arterial Roads

Great Eastern Hwy, Kooyong Road to Tonkin Highway

- The existing design is a missed opportunity, but could be improved with protection such as armadillos (as per photo below) or elevating the cycling space above road level;
- The RSP along the river could be upgraded to a higher standard as an alternative to using Great Eastern Highway. Connectivity to the local street network needs to be reviewed with local bike routes developed;
- Review the need and practicality of providing head start facilities at the signalised intersections;
- Review if permanent speed/red light cameras are needed to keep operating speeds close to the posted speed limit of 60km/h;
- Review the option for a bike boulevard parallel to Great Eastern Highway, including a review of the local bike routes for connectivity;
- The learnings from this section of Great Eastern Highway need to be taken into account when planning for the upgrade of the section between Tonkin Highway and Great Eastern Highway; and
- Bridges over the river should be considered in the longer term to provide greater connectivity.

Armadillo Lane Divider



Source: <http://inhabitat.com/armadillo-cool-recycled-plastic-bike-lane-dividers-keep-cyclists-safe-on-roads/the-armadillo-barcelona-spain-jpg/>

Armadale Rd, Kwinana Freeway to Tonkin Highway

- Construct a PSP on the south side of Armadale Road to link in with the existing shared path;
- Upgrade the existing shared path to PSP standards;
- Provide connectivity to the residential areas on the north side of Armadale Road;
- Consider priority across side roads; and
- Improve the permeability from the existing shared path through and within Atwell.

Ranford Rd (Canning Vale)

- A 3.5 to 4.5m wide PSP should be provided on the southern side;
- Provide a lower standard 2m footpath on the northern side;
- Introduce crossings across side roads to provide priority to cyclists and pedestrians that are placed on a raised section of road accompanied by a regulatory sign showing a speed limit of 40km/h (Wombat Crossing);
- Consider mid-block crossings for connectivity; and
- Explore options for low speed local bike routes that tie in with Ranford Road and other destinations.

Wombat Crossing



West Coast Dr-Karrinyup Road to Hepburn Avenue

- Discourage through commuting traffic;
- Reduce the speed limit to 40km/h and possibly 30km/h at activity nodes;
- Consider the following pavement modification options:
 - Narrow the vehicle lanes down to 3.1m in each direction to free up space for a 3m wide bi-directional bike path. The existing shared path would be retained to provide for slower cyclists and pedestrians;
 - Narrow the vehicles lanes down to 3.0m in each direction to free up space for a cycle lane in each direction with a 0.5m wide protection (such as kerbing) from motorised traffic; and
 - Narrowing the vehicle lanes down 3.2m to provide more parallel parking at a width of 2.2m with a 0.9m buffer zone.
- Install visual traffic calming measures along the median;
- Consider cul de sacing North Beach Road just before West Coast Drive to reduce traffic volumes;
- Consider removing parallel parking in some areas;
- Remove section of road between North Beach Road and Sorrento Street and connect West Coast Drive to North Beach road. Convert this section of West Coast Drive into a cycling boardwalk with flat curbing;
- Flatten curbs and raise road to level of curb; and
- Change colour of the road surface in high traffic volume areas.

Marmion Avenue-Alkimos

- Cyclist underpass required when Marmion Avenue is duplicated;
- As an interim measure, signalisation of the Shorehaven Boulevard intersection should be considered to provide a safe crossing for cyclists and pedestrians. Alternatively, a roundabout could be considered, but would be challenging to provide safe crossing opportunities for cyclists and pedestrians;
- Develop a segregated 3-4m wide bi-directional cycleway on one side of Marmion Avenue with separation from motorised traffic and a 2.5m wide shared path on the other side;
- End of trip facilities could be provided at the bus stops until the train line is extended; and
- On Shorehaven Boulevard provide a footpath on one side and a shared path on the other.

Causeway-Perth

- Provide a new 6-8m wide separate bridge to the south of the Causeway for cyclists and pedestrians (with bikes and pedestrians separated) in the medium to long term;
- Add a new cyclist path bridge next to existing bridge;
- In the short term review the option to remove one traffic lane to provide a wider shared path; and
- This may be achieved by using contra flow to mitigate against the loss of a lane.

Thomas Road-Connection from Kwinana Freeway PSP to Casuarina Prison

- Improve the crossing facilities across the freeway on and off ramps;
- Construct a 3m wide shared path on the southern side of Thomas Road;
- Construct a shared path on Mari Park Drive from Thomas Road to Mari Park Drive to link in with an existing path; and
- Construct a shared path along Park Way and Orton Road, a refuge island on Orton Road at the prison entrance and a link into the prison facilities.

Queen Victoria Street-Stirling Highway to Canning Highway, Fremantle

- Cantilever a new path on the side of the bridge;
- Review the option to remove one or two traffic lanes to create space for a wider cycling path;
- Create a link from the future PSP on the rail line (north of Tydeman Road) and the Fremantle City Centre;
- Convert current Queen Victoria Street bridge to a cyclist and pedestrian boardwalk;
- Potential for high quality signal system with count down and two way cycle path through the intersection of Tydeman Road;
- Modify road into a one-way street travelling south between Stirling Highway and Tydeman Road;
- Extend boardwalk on the western side between Stirling Highway and Tydeman Road;
- Remove Parallel parking on western side of the road between Stirling Hwy and Tydeman road. Save this space for bicycle parking, pedestrian space and alfresco dining space for hospitality businesses;
- Potential to tunnel cycle path beneath Tydeman Road intersection and re-connect with western side of the road;
- Shift road into bike lane on the eastern side. Create two-way bike lane on one side of the road between Parry street and the Queen Victoria Street bridge;

- Resurface and extend shared path on western side between Beach Street and Queen Victoria Street bridge; and
- Under pass on the southern end of the bridge re-connecting to the eastern side of the road running south.

Connections to Stations/Hospitals

Murdoch (includes connections to Fiona Stanley/St John of God Hospitals, local and arterial road examples)

- Provide coherent and legible way finding signage for cyclists at appropriate locations within the Murdoch Precinct;
- Invest in safe and secure bicycle parking at key destinations within the precinct;
- Identify bicycle routes to/from the Murdoch train/bus station;
- Travel behaviour change programs could be implemented to utilise existing infrastructure and increase the workplace and school sustainable transport mode share;
- Examine and identify the preferred cyclist crossing points across Murdoch Drive;
- Reduce roads speeds along cycle routes;
- Set aside undeveloped land for cycling infrastructure;
- Develop a public bike-sharing scheme;
- Create an east – west-cycling boulevard through the precinct;
- Promote good urban design outcomes;
- Grade separated treatment south of Murdoch train station (over the Kwinana Freeway), connecting Leeming with Murdoch and providing a link to the station;
- Create a cycle superhighway along South Street with seamless connection across intersections; and
- Design separated on street bicycle lanes on Murdoch Drive north of South Street to Parry Avenue.

Shenton Park (includes connections to the QEII Medical Precinct, local and arterial roads)

- Determine origins and destinations;
- Identify and define a cycling network utilising TransPriority principles;
- Develop cycle routes on low volumes, low speed roads;
- Improve crossings at intersections;
- Thomas Road/Winthrop Avenue should be developed as on off-road shared path;
- Aberdare Road should be modified to include a raised cycle lane in each direction to replace the existing on road sealed shoulder;
- Provide secure and connected End of Trip Facilities at key locations;
- Remove kerbside parking on one side of road to provide cycling facilities;
- Develop way finding and navigation options;
- Provide End of Trip facilities on both sides of Shenton Station;
- Continue PSP towards Fremantle;
- Widen path on Onslow Road;
- Review traffic calming to be more inclusive of cyclists, while still reducing speeds;
- Increase lighting;
- Provide cycle paths through cul-de-sacs;
- Provide good end of trip facilities at the schools;
- Provide cycling and pedestrian priority at required locations;
- Grade separate the crossing at the Stirling Highway/Broadway/Hampden Road intersection; and

- Provide head start facilities at signalised intersections for cyclists.

Claremont Station

- Need to identify and promote primary routes to/from the station that connect with destinations;
- Identify secondary routes;
- Develop colour coded routes with maps available at the station;
- Grade separations required at Stirling Highway to provide a connection with the river;
- Construct bike paths through parks;
- Create separated bike paths;
- Engage a mediator to work with the four local authorities to develop a plan;
- Provide bike facilities at Claremont Quarter; and
- Ride potential routes with a range of potential riders before finalising plans.

Greenwood Station

- Make the local road more friendly via reduced speeds and tree plantings into the verge to create an enclosed effect;
- Clearly define cycle routes;
- Create new paths to link the local road network to the station;
- Improve PSP lighting; and
- Plan cycling links from the station to the high schools.

Connecting Schools

Mt Hawthorn Primary School

- Survey students and parents to determine what the barriers are;
- Review the design and operation of the bridge;
- Develop treatments to reduce car volumes on local roads;
- Identify cycle to school streets and redesign them for cycling with a focus on crossing points; and
- Provide end of trip facilities to meet with demand.

Phoenix Primary School

- Make it easier for cyclists and pedestrians to cross Rockingham Road and Phoenix Road;
- Increase accessibility to the Cockburn Civic Centre and Phoenix Shopping Centre;
- Widening the pedestrian crossing on Rockingham Road outside Phoenix Shopping Centre;
- On-road bicycle lane on both sides of Sussex Street;
- Modify Rockingham Road to two lanes from four, add median strip and bicycle lane on both sides and widen footpaths leading to the Phoenix/Rockingham intersections on both sides of Rockingham Road;
- Limit the size of vehicles using Rockingham Road and move freight usage to Stock Road;
- Modify Phoenix Road from four lanes to two. Widen paths on each side and include on road cycling lane on each side. Space from footpaths should be taken for bus stops in order not to hinder cyclists in bicycle lane;
- Widen paths along Carrington Street and implement shared paths along the verge;
- Add an on road bicycle lane along Kent Street; and
- Add a pedestrian crossing on Rockingham Road at Kent Street.

Bibra Lake Primary School

- Create a friendlier environment for cyclists by developing a connected network;
- Determine where the missing links are and rectify;
- Create a bike boulevard on Annois Road;
- Change vehicle access to the school away from Annois Road;
- Make the cycle lanes on Parkway Road safer with treatments such as armadillos;
- Offset paths from the edge of the kerb;
- Provide connections from the future Roe Highway PSP to the cul-de-sacs;
- Provide a crossing on Bibra Drive;
- Provide cycling and pedestrian education;
- Discourage car use in close proximity to the school;
- Improve signage and way finding;
- Change the regulations to allow people of all ages to ride on footpaths;
- Undertake public consultation for any proposed improvements;
- Provide riding training for students and parents; and
- Improve end of trip facilities.

Perth Waldorf School

- Provide connections to the future Roe Highway PSP;
- Provide protected bike lanes on Forrest Road; and
- Provide connections to the Bibra Lake RSP.

Roundabouts

Hackett Drive/Australia II Drive, Nedlands

- Add a raised plateau on approach for cyclists and motorised traffic;
- Reduce the speed limit;
- Provide off road facilities for less experienced cyclists;
- Before the roundabout provide a gap in the median for cyclists to enter UWA;
- Provide protection for the southbound movement with options such as armadillos and widen the cycle lane;
- Improve sight lines;
- Implement raised platforms at crossing points to emphasis priority and move crossing points to be 6m back (one car length) from holding line;
- Try shark teeth markings to provide priority for cyclists at crossings;
- Apply a green treatment in the cycle lane on approach, through and on departure to highlight the cycling facility;
- Provide a cycling only tunnel;
- Change the intersection treatment to priority control or traffic signals; and
- Monitor after any changes.

Hester Avenue/Marmion Avenue, Quinns Rock

- Change the black asphalt cycle lane to red;
- Consider removing kerb nib either side of the bus stop/shop;
- Add flashing lights on approach that are triggered by cyclists;
- Create a cyclist bypass;
- Separate cyclists and pedestrians completely from the roundabout via an underpass or overpass, possibly through the centre of the roundabout;
- Modify the roundabout to keep vehicles lane correct;
- Reduce the through speed for vehicles;
- Add pre deflection for motorised traffic;
- Consider a turbo roundabout; and
- Undertake community consultation for any proposed improvements.

Appendix C - Acronyms

AITPM	Australian Institute of Traffic Planning and Management
DoE	Department of Education
DoH	Department of Health
DoP	Department of Planning
DoT	Department of Transport
LGA's	Local Government Authorities
PTA	Public Transport Authority
PSP	Principal Shared Path
RSP	Recreational Shared Path
UWA	University of Western Australia
WABN IRG	Western Australian Bicycle Network Plan Implementation Reference Group
WALGA	WA Local Government Association