Cycle Wanneroo

City of Wanneroo

Wanneroo Bike Plan

| 0

7 July 2015

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B	26 May 2015	Draft Version 2 – Including Client Comments	KW		
C	3 June 2015	Steering Group Additions	KW		
0	7 July 2015	Final Report	KW	ER	KW

Contents

Foreword from Major of Wanneroo

As a council we want to see more people choose cycling as their preferred means of travel, helping make Wanneroo a greener, healthier place to live and work. But many people still do not see cycling as an option for them to get about. This is despite the fact that one third of all road journeys in Wanneroo are less than 5km in length.

Executive Summary

The City of Wanneroo is a large local government and geography in Perth, Western Australia, located on the northern coastal fringe of the Perth metropolitan area, approximately 25km north of the Perth CBD.

Journey to work data from the 2011 ABS data shows 70.7% of residents drive to work whilst cycling within the City is currently estimated to be less than 1% of all transport trips. There are significant benefits that can be achieved through increased levels of cycling that apply to both individuals and the broader community, including:

- Reduced congestion on the road network
- Improved health and fitness
- Energy efficiency and less use of petrol and fossil fuels
- Cost savings to Governments
- Less cost to individuals
- Improved accessibility to activities by people of all ages
- Economic benefits

The City's population is growing at a faster rate than any other local government in Western Australia. Currently, there are approximately 179,800 people living in the City of Wanneroo, which equates to an increase of over 27,000 persons since the 2011 Census. The population of the City of Wanneroo is forecast to grow to more than 350,000 by 2036.

The City is served by two major north-south arterial roads, Wanneroo Road and Marmion Avenue which run parallel to each other through Wanneroo' s eastern and western suburbs respectively. The Mitchell Freeway is proposed to be extended further north to service the demand of travel.

The City is responsible for the provision of an integrated road transport network that caters for all users including cyclists, pedestrians, vehicles and public transport. The Strategic Community Plan is a key document for the City and elements of this report with key recommendations of this plan have been taken forward as recommended actions to be included in the Community Plan.

"Cycle Wanneroo" highlights the role of cycling in the integrated road transport network and the methodology used to develop the strategy and implementation plan. This document has been divided into two sections to reflect the strategic nature of cycling and the requirements going forward from a planning and strategic development perspective and also to provide a schedule of considered measures, infrastructure and facilities to move cycling forwards within the area.

- Part 1: Cycling Strategy
- Part 2: Implementation Plan


FOR SALE

PART 1: Cycling Strategy

1. Introduction

1.1 Setting the Scene

Cycle Wanneroo provides the City of Wanneroo with a strategic document that outlines a clear direction forward in making cycling a mode of choice for transport. Accompanying Cycle Wanneroo is a detailed implementation plan to deliver the vision of transforming the City into a bicycle-friendly environment.

Cycle Wanneroo and its associated cycling infrastructure detailed in the implementation plan is crucial to link the City's transport hubs and activity centres such as the Yanchep Metropolitan Centre, Wanneroo District Centre, Clarkson Train Station, Butler Train Station, Wangara Industrial Area, the proposed Neerabup Industrial Area, the city's schools and commercial precincts as well as new residential development areas within the City.

Central to the development of Cycle Wanneroo is a clear vision to guide the transformation of Wanneroo into a bicycle friendly city as well as achieving the desired objectives outlined in the strategy.

Our Vision:

> To make cycling an integral part of daily life in Wanneroo, so that persons of all ages and abilities can utilise bicycles safely for all types of trips

Three goals are critical to achieve the above vision for cycling in Wanneroo:

- Achieve a 5% mode share for cycling by 2031;
- Achieve an 8% mode share for cycling by 2051; and
- Work towards a future of zero cyclist fatalities and serious injuries in the City of Wanneroo

Based on the above vision and goals, our proposed approach in developing and implementing the cycle plan is to focus on the following three approaches:

- A community vision and aspiration that ensures land uses contribute to a sustainable city
- A cycle strategy and accompanying implementation program that is focused on the vision to create a high quality, connected, accessible bicycle network that will attract and encourage a broader spectrum of the community to cycle
- Recognition that active transport has health, congestion reduction, environmental and money saving benefits for both the individual and the broader community


MITCHELL FWY
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Perth

2. Vision, Goals and Approaches

2.1 Objectives

Three goals are critical to achieve the above vision for cycling in Wanneroo:

- *Achieve a 5% mode share for cycling by 2031;*
- *Achieve an 8% mode share for cycling by 2051; and*
- *Work towards a future of zero cyclist fatalities and serious injuries on the Western Australian Cycling Network.*

Although the current cycling environment is poor in certain locations and much needs to be done to make cycling safer and more attractive, it is considered this target is achievable when compared with what has been achieved in other cities.

Two cities that achieved a major turnaround in the level of cycling are Berlin in Germany and Portland, Oregon in the USA.

2.1.1 Case Study 1: Berlin, Germany

Berlin, in Germany, never had the same high historic levels of cycling as Copenhagen and Amsterdam, but a transformation has occurred that has seen cycling mode share increase from 3% (1970, West Berlin and 1990, East Berlin) to 10% in 2005. Bicycle trips in Berlin quadrupled between 1970 and 2005. During the same time, cycling levels in London and most of UK cities decreased. The introduction of safe (mostly off road) facilities is credited with transforming cycling in Berlin. In 2004, Berlin had:

- 620 kms of separate bike paths;
- 60 kms of on road bike lanes;
- 50 kms of bike lanes on sidewalks;
- 70 kms of shared bike lanes;
- 100 kms of joint pedestrian / cyclist sidewalks;
- 190 kms of off road bikeways through parks and forests; and
- 3,800 kms of traffic calmed neighbourhoods.

2.1.2 Case Study 2: Portland, Oregon

The transformation that has occurred in Portland, Oregon in the USA is perhaps the most relevant to bicycle transport planning in Australia. The car dependence in the USA is similar to that in Australia and it can be argued that the factors that reduce car dependence in favour of more cycling in Portland are likely to be applicable in Australia.

Between 1996 and 2008 the mode share of cycling in Portland, Oregon increased from 2% to 8% (*Portland Bicycle Plan for 2030, Final Draft, 2010*). As was the case in the European cities, a key success factor was the construction of many kilometres of separate bike paths - $480 kms of bikeway have been constructed, most of these after 1991. **Figure 2.1** shows the Portland adoption of Copenhagen style bike paths.

2.1.3 Emerging Policy Advice Following Visit by Dutch Transport Planners

A key initial message from the Dutch planners was that Australian drivers are more aggressive than their Dutch counterparts resulting in Australian cyclists being exposed to greater danger. The Dutch planners advised that transport and bicycle planners will need to work co-operatively with other professional groups such as planners to seek out integrated solutions and outcomes for safer and more liveable centres.

As the visit progressed the Dutch planners focused on the need to create a safe environment for those who want to cycle, but do not feel safe to do so. Current circumstances in Perth seemed to reflect the situation that existed in Amsterdam and other Dutch centres in the 1970s, prior to a change in policy to create a safer environment for cycling.

An intense one day workshop held on day 4 of the visit, was attended by 140 people with a wide range of skills and interest in cycling. The key takeaways from the workshop were:

- The current practice of encouraging cyclists to ride along arterial roads in mixed traffic, or on sealed shoulders or on at grade on-road bike lanes has not been successful in achieving increased cycling, as it is associated with a low level of perceived and real cycling safety concerns.

- Whilst the preferred option is to develop a safe connected cycling network (as is the case in The Netherlands) to meet the cycling demand to destinations along these routes, this will need to be balanced in the short term with the development of alternative bicycle routes along local parallel routes.

- Where separated bicycle paths are not a realistic option based on road reserve width or the existence of high speed intersection treatments, including roundabouts, local street bicycle connections will need to be developed. To be attractive and safe for cyclists the local street bicycle boulevards will need to offer a safe alternative that is reasonably direct and safe. A speed limit of 30kph and low traffic volumes were considered essential to make these routes attractive.

- Integrated bicycle plans are required to provide safe, convenient access for all key destinations in the City including – existing and future activity centres (this would include shopping centres), key employment centres, community facilities, educational facilities, key coastal nodes and transit nodes

- Intersections designed for high speed traffic, such as exist in Wanneroo are unacceptable for cyclists and either need to be redesigned, alternative bypass routes developed or grade separated overpasses or underpasses provided that maintain an attractive direct route for cyclists.

- On-street bicycle lanes or cycling in mixed traffic adjacent to on street car parking provides an unsafe environment that is unacceptable for a bicycle route even for short distances. The difficult option of removing on-street parking may need to be considered.

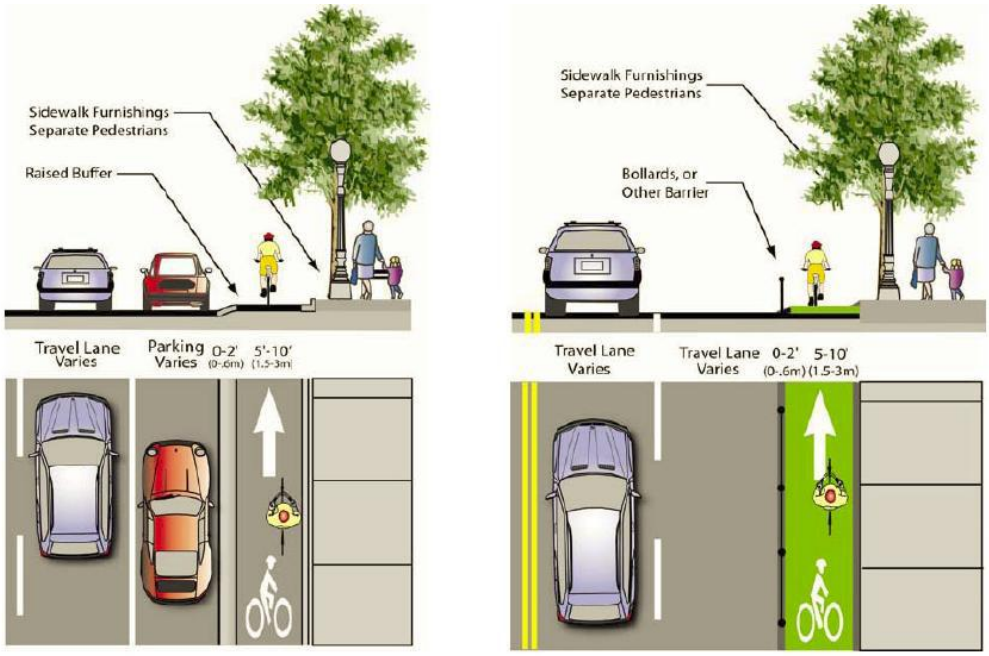
- End of trip facilities, including adequate bicycle parking, lockers and showers are essential to encourage people to cycle as opposed to continuing to drive.

- A programme of developing safer, lower speed intersections, including roundabouts and traffic signals is an essential part of developing safe, attractive bicycle routes.

- Bicycle planning needs to be considered as an integral part of new land development, or redevelopment of major sites. Development approval conditions should be applied to require safe bicycle networks and end of trip facilities to be constructed by developers.

The Department of Transport is considering these messages with a view to introduce policy changes for implementation of safe, attractive bicycle infrastructure.

Figure 2.1: Portland, Oregon adaption of Copenhagen style bike paths



Notwithstanding what has been achieved elsewhere, increasing cycling to 5% of all trips in Wanneroo by 2031 remains a challenge, given the low levels of cycling and poor cycling environment that exists at present. It will require a real commitment on the part of the City of Wanneroo to implement the proposed strategies (**Section 6**) and invest heavily in cycling. The City of Wanneroo has shown in principle support in its policies for increased cycling and less car use, but this support will need to go to a new level and involve a significant change to transport investment, if these targets are to be achieved.

Achievement of a transformational change of the type proposed will require the Council at all levels to understand the benefits, including financial benefits that will accrue from the change.

2.2 Principles for Bicycle Planning

2.2.1 Overarching Principles Developed in The Netherland's

The cycling principles adopted for the Wanneroo Bike Plan are based on principles initially developed in The Netherland's, although these principles have been used in many countries and jurisdictions that have introduced transformational bike plans. The overarching principles are:

- **Attractiveness** – each route should feel attractive to use and include a feeling of personal safety for users.
- **Coherence** – there should be a choice of routes and the network should be legible and easy to use.
- **Comfort** – surface should be smooth and well maintained. Number of stops along the route should be minimised.
- **Directness** – direct routes with no unnecessary detours to provide journey times by bicycle that are competitive with the car.
- **Safety** – separate cyclists from motorists and pedestrians where necessary, but allow mixed use along low speed, low volume streets. Design should be predictable in terms of alignment and priority.

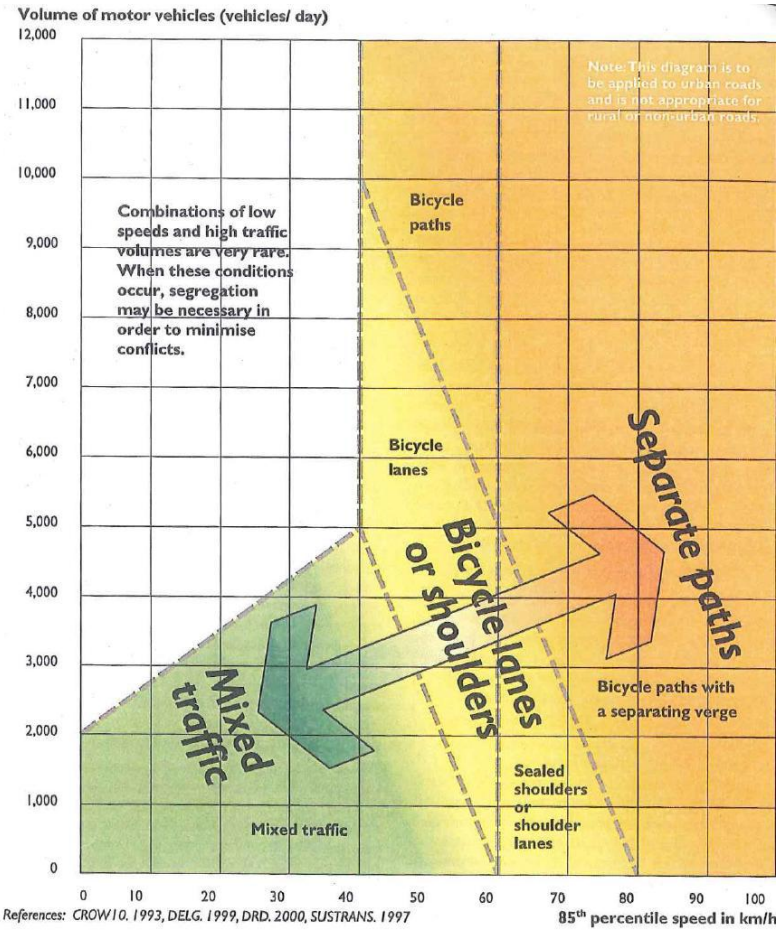
These principles, although general in nature, provide a logical framework for bicycle planning and design and support the twin objectives of "getting more people cycling" and "making cycling safer".

2.2.2 Targeted Bicycle Planning Principles for Wanneroo

These planning principles are in conformity with the overarching principles discussed in **Section 2.2.1**. If implemented they will fundamentally change the nature and culture of street planning within the City of Wanneroo from a street network almost exclusively planned and designed for travel at relatively high speed (for cars, trucks and buses) to one that employs a range of planning and design techniques to provide safe passage for all road users. Key planning principles are:

- Provide a variety of cycling route options.
- Ensure each route is continuous and connects to a clear destination. Avoid changing facility design (ie. On road to off road) along a route where possible.
- Ensure safe bicycle routes connect to destinations and attractors in the same way as the street network does. Provide safe bicycle routes to all schools, railway stations, major bus hubs, activity centres, shopping centres etc.
- Ensure separate bicycle paths are provided along higher volume and higher speed bicycle routes. Use current Austroads guidelines, originally developed in The Netherlands as a guide.

Figure 2.2:

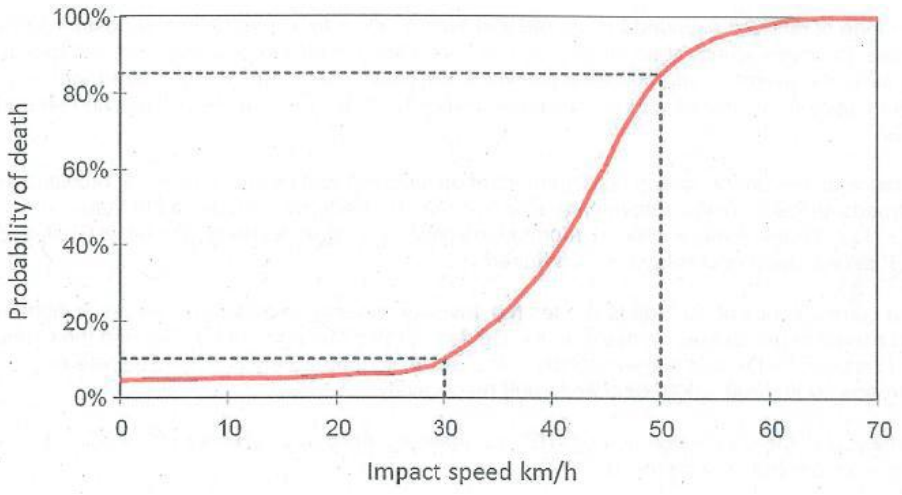


- Design all intersections along designated bicycle routes in a manner that gives priority to cyclists and therefore enhances cyclist comfort, reduces delay to cyclists and maximises safety for cyclists.
- Develop a signed network of low speed (30kph) bicycle boulevards along low speed and low volume streets. Implement complementary traffic management measures to ensure both speed and volume remain at an acceptably low level. 30kph has been selected as the preferred maximum speed on bicycle boulevards, because this is the speed that has been used

successfully in The Netherlands and other European countries and because the probability of death in a collision with a motor vehicle is much less below this speed (refer **Figure 2.3**).

- The State Government's road safety strategy, *Towards Zero*, sets an ambitious target of 11 000 fewer deaths and serious injuries by 2020. The "Safe System" approach, which underpins *Towards Zero*, views the road transport system holistically by seeking to manage the interaction between road users.
- The "**Road Towards Zero"** is designed to meet these expectations. It sets the direction to develop innovative solutions that move beyond current standards – Solutions that deliver inherent safety in the road network to address the priority areas identified in Towards Zero, which Cycle Wanneroo is helping to underpin.

Figure 2.3: Probability of death to pedestrian in a collision with a motor vehicle



Source: OECD & ECMT (2006)

- Integrate bicycle planning as a part of the broader planning undertaken by the City in co-operation with State Agencies. Bicycle planning needs to be a key consideration in the planning for:
  - Activity centres;
  - Community centres;
  - Shopping centres;
  - New city centres (eg. Yanchep);
  - Schools;
  - Train stations and public transport hubs; and
  - Major parks and beaches.
- Educate cyclists, motorists and other road users on the appropriate and safe use of the road system.

2.3 Cycle Wanneroo Strategies

The strategies proposed to drive achievement of the Wanneroo Bike Plan objectives and have been developed to target mode share targets – getting more people cycling and zero fatalities – making cycling safer.

- Getting more people cycling; and
- Making cycling safer

The strategy will need to be much broader than plans to develop safe connected bicycle routes, important though this is to the success of the plan. The strategies cover the following:

- Development of a strategic connected network of safe to use bicycle routes that link to activity centres, education (schools, TAFE and universities), employment centres, hospitals, transport hubs, shopping centres, sport and recreational facilities etc.
- Land use planning that fully integrates cycling into structure planning and development assessments as a mainstream transport mode, by reserving land for cycling facilities and requiring all developments to provide end of trip facilities for cycling and, in the case of major developments, improving cycling infrastructure in the vicinity of the development.
- Develop travel plans for schools, hospitals, universities, work places, shopping centres, community and recreational facilities and major transport hubs that encourages and facilitates greater use of cycling.
- Promote the social, environmental, economic and community benefits of more cycling to key decision makers, including Wanneroo City Councillors and senior management, relevant state agencies, developers and major employers and run information and engagement sessions with community and stakeholder groups.
- Educate cyclists, motorists and other road users to increase awareness of potential dangers, improve riding and driving skills and knowledge of the road rules and encourage greater tolerance to and from other road users.
- Develop a staged implementation plan designed to meet the key goal of achieving 5% of all trips within Wanneroo by bicycle by 2031 and ensure sufficient funding is allocated in Council's budgets and forward plans for implementation.
- Establish a small team with responsibilities for sustainable and integrated travel planning and policy which includes monitoring and implementation of the bike plan, collaboration with relevant other sections within the Council and with State Government agencies and others and regular (twice annual) reporting to Council.

These approaches mirror those taken in successful jurisdictions that have been successful in achieving a major turnaround in cycling, including Portland in the USA (2% cycling use to 8% in 12 years) and Berlin in Germany (3% to 10% over 25 years). They also reflect the approach taken in The Netherlands and in Denmark where cycling mode share is in the order of 30% of all trips. Importantly, the Department of Transport is now engaging with Dutch planners and is supporting many of the approaches recommended in this plan.

More information on each of these strategic approaches is contained in the following sections.

2.3.1 Develop a Network of Safe Connected Bicycle Routes

At present there is no established network of bicycle routes and very few connected safe routes for cycling within Wanneroo. Almost any cycle journey undertaken in Wanneroo must travel in mixed traffic for all of most of the journey. Emphasis should be given to existing and future activity centres (this would include shopping centres), key employment centres, community facilities, educational facilities, key coastal nodes and transit nodes.

The local street system is not well connected and the distributor road network has a design speed of more than 60kph, which is unsuitable for on road cycling. Given these circumstances it is not surprising that the level of cycling in Wanneroo is very low.

Over a period of 15 years a connected network of safe routes will need to be developed with a reasonably fine grained network to ensure cyclists can safely access all desired destinations in the same way as cars do. The bicycle network should incorporate:

- Off street principal shared paths adjacent to the Freeway and the Railway.
- Off street one way or two way cycle paths along many of the distributor roads that connect and provide access to activity centres, shopping centres, universities etc in the same way that the major street system does for cars. These paths should be on the verge and be separated from footpaths. For this reason these paths are called separated cycle paths.
- On street cycling lanes along lower speed and lower volume neighbourhood connector streets. These lanes are generally suitable for streets with traffic speeds below 60kph and daily traffic volumes below about 7000 vpd (refer **Figure 2.2**)
- Develop a network of low speed (30kph) bicycle boulevards using the local street system. This offers a low cost solution in areas where the speed of traffic can be kept below 30kph and where traffic volumes can be kept low, which is a key requirement for these boulevards. It is also essential that the routes be reasonably direct and connect to centres and other areas that people want to access. Also they need to be well signed to ensure legibility.
- Shared paths also have a role for more local bicycle movements, including to schools, but under current legislation they are of limited use for longer routes because of the requirement for cyclists to dismount at intersections and side streets.

Three important criteria will need to be applied to the selection of routes:

- They will need to be continuous and connect to locations that people need to access
- The major routes in particular need to be fairly direct and taken together provide a well connected network that enables short cycling trips (<5km) to be competitive with the car.
- Safety, comfort and convenience of intersections along the route. Side streets along the route should be designed in a way that allocates priority for through cyclists over turning vehicles. Where cyclists need to cross a major traffic stream safe crossing facilities need to be provided. This can be achieved with careful design for one lane roundabouts or traffic signals. Two lane roundabouts will not normally be acceptable without grade separation for cyclists of the major traffic and turning movements. In some cases it may be necessary to replace large two lane roundabouts with traffic signals or an alternate cycle route may need to be examined. The City will need to start planning the installation of grade separated facilities at dual and tri lane roundabouts using ROM modelling data produced as part of the development of the City's integrated Transport Strategy.

In some of the established areas of the City the retrofitting of safe bicycle routes along major distributor roads will be difficult and in some cases too costly to implement in the medium term prior to 2031. For this reason, significant emphasis will need to be given in the short term to development of low speed bicycle boulevards, (30kph speed limits) complemented by bicycle lanes along lower speed neighbourhood connectors with 50kph speed limits and a few separated paths linking the principle shared path network to major destinations.

As part of the development of the network emphasis will be given to development of access plans to service:

- Rail stations and bus hubs in centres
- Major activity centres and shopping centres
- Tertiary education institutions and hospitals
- Schools
- Community and recreation centres

The access plans developed for the above will use a variety of route types, the major components of which will contribute to the sub-regional bicycle network plan linking key activity centres and locations where people need to access. As a hirerchy for this plan the activity centres should from the starting point for the integrated network.

2.3.2 Integrated Land Use and Transport Planning

Wanneroo's residential population and non-residential development is growing quickly. This results in structure plans being assessed and approved by the city on an on-going basis. This provides an opportunity to ensure that a safe connected cycling network is designed in an integrated way as part of the road system development and land development in the area. The approved cycle system should be constructed by developers in accordance with approvals as is the case for the road system.

Bicycle parking and other end of trip facilities should be required as a condition of development approval. The number of parking bays for cycling in non-residential development should be in proportion to the target mode share of cycling relative to cars. The volume of parking should be a consideration for all developments and can be enforced through development approval conditions.

The amount of bicycle parking required for developments would need to be re-assessed around 2020 and increased where necessary to take account of increased cycling and future cycling mode shares, past 2031.

For major office or retail developments, major facilities such as hospitals and tertiary education institutions, travel plans should be prepared. For new developments this should be a condition of development whereas a negotiated agreement will be required for existing developments.

Perth has been a leading city worldwide in the development of behaviour change programmes since the late 1990s. The Household TravelSmart program has consistently achieved a reduction in the proportion of car drivers of about 10%. If combined with a range of measures to make cycling more convenient and safer, as proposed in this strategy, the likely result will be an even greater reduction in the level of car dependency.

2.3.3 Promote the Benefits of Cycling

There are major benefits to individuals, businesses, and government from increased levels of cycling. They result in a variety of social, environmental, economic and community benefits that include:

- Reduced congestion and dependency on cars
- Improved health and fitness
- Reduced travelling costs for individuals
- Benefits to the local economy
- Savings on transport infrastructure, and
- Less use of petrol and fossil fuels

Sections of the community are becoming more aware of these benefits. However the benefits need to be promoted more widely including to decision makers responsible for transport planning and delivery of transport infrastructure. Increased levels of cycling will reduce car use and reduce the overall cost required to provide transport infrastructure and maintain a high level of accessibility for the community.

The on-going benefits of increased and safer cycling, including the economic benefits, should be widely communicated to decision makers within Council, key stakeholders and the broader community. In particularly this information should be incorporated with budgeting and forward planning with a view to ensuring the Wanneroo Bike Plan is adequately funded.

2.3.4 Education and Skills Training

WA has the worst safety record in any state in Australia and is in the lowest fifteen percentile of 33 OECD countries. There is an urgent need for improved education for road users generally. It is recommended that the City of Wanneroo take leadership of this issue within its own area with respect to safety and skills training for cyclists in collaboration with groups such as the Department of Transport, the Office of Road Safety and the RAC. Key components of the proposed road safety strategy are:

- Value add to programs delivered by other organisations to improve the skills and road rules training targeted at children in co-operation with local schools
- Awareness programmes and campaigns for safe cycling targeted at both motorists and cyclists in conjunction with the Office of Road Safety and the RAC and including advertisements and focus articles in the local media.

2.3.5 Staged Implementation and Funding

It will take a number of years, a real and ongoing commitment on the part of Council and a significant investment to create the transformational turnaround necessary to make cycling a real option for most Wanneroo citizens. The road system that has been developed in Wanneroo over the past 40-50 years is hostile to cycling, with both speeds and traffic volumes too high on the connected road network to guarantee safe use by cyclists.

Incremental change through consideration of short sections of separated off street paths that are widely dispersed throughout the City will not deliver a safe cycling network in the short term. This has been done in other jurisdictions and in other cities in the past and regrettably measures to encourage cycling without provision of a safe connected network, often results in an increase of cycling injuries in the short term.

Prior to implementing measures to increase cycling usage and constructing cycling network improvements in a seemingly disconnected way, the following staged implementation strategy is recommended.

2.3.5.1 Workshops with Councillors and Senior Staff

These workshops should be facilitated by people with experience in the needs of cyclists, and have the following objectives:

- Create a joint understanding of the social, environmental, community and economic benefits that successful implementation of the Wanneroo Bike Plan will bring
- Obtaining commitment to the principles and strategies of the Wanneroo Bike Plan as a means of changing travel behaviour and encouraging more cycling
- Recognition and agreement that successful implementation of the Wanneroo Bike Plan will require a significant injection of funding at both the Council and the State Government level on an ongoing basis but recognising that this increased level of funding can be offset by reduced levels of funding to road construction due to reduced levels of car driving

Desired outcomes of the workshops would include formal Council endorsement of the Bike Plan.

- Agreement to establish a budget review committee to re-apportion transport infrastructure funding over a 5 year period to enable development of Stage 1 of the Wanneroo Bike Plan.
- Agreement to undertake discussions with the Department of Transport and other key stakeholders with a view to obtain endorsement of the plan and a commitment to shared funding
- Establishment of a formal monitoring programme of the Bike Plan with twice yearly reporting to Council

This workshopping session is considered to be a crucial first step in introducing the cultural and financial change that will be necessary to implement a successful Bike Plan for Wanneroo. This is because small scale incremental change will not change bicycle use other than marginally and is quite likely to see increasing levels of bicycle injuries. It will also not achieve lower levels of car usage and the associated social, environmental and economic benefits this will bring.

2.3.5.2 Establish Skills and Education Programmes

It is recommended that a skills and education programme be introduced within a year of adoption of the Bike Plan. Key components of this plan should include:

- Bicycle skills training for children in collaboration with local schools
- Community sessions to improve knowledge on safe driving and cycling and to encourage greater tolerance by drivers of cyclists and vice versa
- Campaign through the local media to promote the Wanneroo Bike Plan and the benefits of cycling more generally and to promote and encourage participation in skills and education programmes for cyclists and drivers

2.3.5.3 Implement Connected Safe Routes on a Precinct Basis

It is recommended that 5, 10 and 15 year safe, connected bicycle route plans be developed and implemented. The initial 5 year plan will need to concentrate on achieving a connected network around a limited number of attractors, including schools, stations and activity centres. In each case the network will need to be developed out from the centre, school or station. Initially, at least it will not be possible, for financial reasons, to improve the bicycle network throughout the municipality. This will require the Council to allocate funding to specific areas in the first 5 years.

Additionally, whilst a connected network of safe, separated bicycle paths remains the medium to long term objective, it will not be achievable in the first 5 year plan. Initially, to achieve the greatest benefit for dollars expended, it is recommended that significant emphasis is given to development of low speed bicycle boulevards supplemented by a connection of on street bicycle lanes along neighbourhood connector streets.

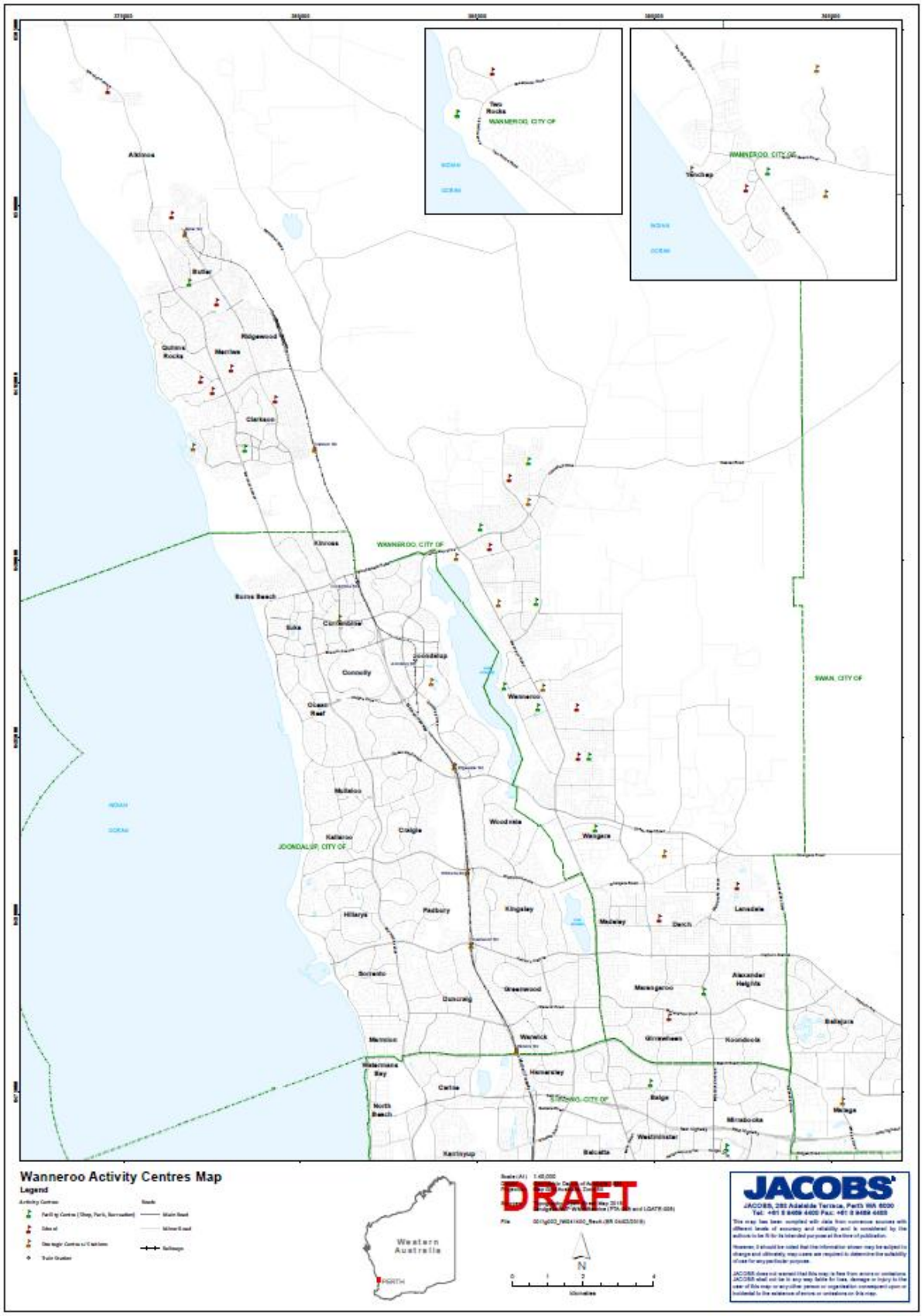
Separated bicycle paths remain an important component of the bicycle network. In the first 5 years, the main opportunities to develop this network will be through the City's road development programme where changes from on-road bicycle lanes to separated paths can be implemented, and in developing areas where structure plans can incorporate separated paths that can be implemented by developers as part of the overall transport network.

2.3.6 Management and Monitoring Team

Beyond the development of the Wanneroo Bicycle Plan, its successful implementation will be dependent upon the establishment of a team of people with specific responsibilities for its planning, design, and development and monitoring. This could be council officers and cross director rate team who manage the development of the bicycle plan.

It is recommended that a small team of professionals be established to:

- Continue to develop sustainable integrated transport policies which includes cycling policies
- Manage implementation of active transport initiatives, including those designed to increase usage of cycling
- Represent the needs of cyclists and pedestrians as part of an integrated transport and land use plan for the City


Wanneroo Activity Centres Map
Legend
DRAFT
Western Australia
PERTH
JACOBS
JACOBS, 252 Adelaide Terrace, Perth WA 6000
Tel: +61 8 9469 4400 Fax: +61 8 9469 4455
Two Rocks
WANNEROO, CITY OF
Yanchep
Alkimos
Butler
Ridgewood
Quinns Rocks
Merriwa
Clarkson
Kinross
Burns Beach
Eglinton
Currambine
Joondalup
Connolly
Ocean Reef
Mullaloo
Kallaroo
JOONDALUP, CITY OF
Craigie
Woodvale
Wangara
Hillarys
Padbury
Kingsley
Madeley
Darch
Lenadale
Sorrento
Duncraig
Greenwood
Marangaroo
Alexander Heights
Menora
Warwick
Girrawheen
Koondoola
Ballajura
Waterman Bay
Carine
Hamersley
North Beach
STIRLING, CITY OF
Balga
Mirrabooka
Westminster
Balcatta
Karrinyup
Malaga
SWAN, CITY OF

3. The Benefits of a Cycle Friendly Wanneroo

3.1 The Role of Cycling

In some world cities cycling plays a major role in the movement of people around the city for transport purposes on a daily basis. In some cities cycling has always been a popular mode of travel, whereas in others, increases in the numbers of cycling trips have been induced by supportive policies and strategies and by creating safe, continuous networks for cyclists to use.

In Australian capital cities 50% of car trips are under 5 km, which if safe routes were to be available, is a comfortable cycling distance for most people. PARTS survey results for 2006 show that average car trip lengths in outer areas vary between 11.3% and 19% more in outer areas compared to the metropolitan Perth average. From an analysis of PARTS trip data Jacobs estimates that between 35% to 40% of all car trips in Wanneroo would be shorter than 5kms. Given that 60% of all trips in Wanneroo are currently car driver trips it would require between 16% and 20% of these short car trips to convert from car driving to cycling to achieve an increase in cycling mode share from 1% to 5% by 2031.

For short trips, cycling can take as little or less time as any other mode of transport. Also, it is a low cost means of travel and is attractive to some who choose to combine part of their daily exercise with a necessary transport journey, thus saving time in the overall daily routine. For many people, cycling can result in a financial saving when compared to public transport or driving, particularly if this results in one less family car being required. Finally, for young people under driving age, or others who choose not to drive, cycling can provide an independent means of travel (saving parents or others from having to escort passengers for a variety of trips).

For these reasons, cycling can become a transport mode of choice for a variety of trips for a significant proportion of the community. A cycling mode share of 5% seems achievable over a period of about 15 years, provided safe, and connected cycle paths are constructed. This level of cycling would reduce the proportion of daily car driving trips by about 6% and make a very significant contribution to reducing congestion and improving accessibility for many people. It would also result in significant savings on road expansion projects, which would more than offset the expenditure on cycling.

Cycling in WA benefits from both a favourable climate and the relatively flat terrain similar to other high mode share countries makes cycling a viable option.

There are a broad range of benefits that can accrue from an increased level of cycling. These go well beyond the transport portfolio and some are not fully considered in the economic assessment and comparison of projects, if indeed any such assessment takes place.

The following are some of the benefits that need to be promoted as part of any plan to improve cycling as part of a more sustainable transport plan:

3.2 Reduced Traffic and Congestion on the Road System

By 2031, the population of the City of Wanneroo is expected to grow from 185,000 (2015) to 300,000. If car driver levels were to remain at about 60% of all travel, an extra 240,000 trips each day would be generated on Wanneroo's road system. Cycling trips would only increase by 4000 trips/day.

If cycling were to increase to 5% of all travel in line with the proposed target, and public transport were to increase from 5% to 8% in line with current government projections, we could expect car driver mode share to reduce by 10%. This would result in a significant reduction of 63,000 car trips each day on Wanneroo's road system – a reduction of 10% compared to business as usual.

The current and potential mode share of travel in Wanneroo in 2011, 2031 and 2051 is shown in **Table 3.1** below.

Table 3.1: Potential future travel mode share

Mode Share for:	2011	2031	2051
Car Driver	60%	54%	48%
Car Passenger	25%	21%	18%
Public Transport	5%	8%	11%
Walking	8%	10%	13%
Cycling	**1%**	**5%**	**8%**
Other	1%	2%	2%

In the longer term to 2051 (and assuming a population of 500,000) car driver trips would be reduced by 20% or over 200,000 trips per day by achievement of the above targets.

A reduction in car travel of this magnitude will be necessary to keep congestion at a level that can be managed. A reduction in traffic flows of 20% will have flow on benefits including:

- Reduced expenditure on road expansion and maintenance;
- Reduced expenditure on car parking;
- Reduced road trauma (fatal and serious injury road crashes); and
- Improved amenity and reduced environmental impact due to less car travel.

3.3 Improved Health and Fitness

Health costs in Australia are increasing at a much higher rate than inflation. Reduced physical activity is contributing to an increase in obesity, heart disease and diabetes. The Australian National Physical Activity Guidelines recommends 30 minutes of physical activity each day to help counter this trend. For many people, much of this required physical activity can be achieved through cycling undertaken for either recreational or transport purposes. Physical activity decreases the likelihood of illness such as coronary heart disease and many studies have shown that cycling for at least 30 minutes a day gives people a level of fitness equivalent to being 10 years younger.

3.4 Improved Accessibility for More People

Independent mobility is provided to many young people and others without access to a car. In addition, the cost of driving and parking is reducing affordable accessibility for many. Research undertaken in the USA shows that improved cycling facilities improved accessibility and the local economy (How 21st Century Transportation Networks Help New Urban Economics Boom). www.sfbike.org/.../Protected_Bike_Lanes_Mean_Business.pdf)

3.5 Less Use of Petrol and Fossil Fuels

More cycling contributes to less car use and reduced use of petrol and fossil fuels. This contributes to improved air quality, reduced greenhouse gases and an improvement to Australia's balance of payments through reduced import of oil.

3.6 Improved Safety

As more people cycle, the awareness of cyclists improves and cycling becomes a safer mode of travel through safety in numbers.

Figure 3.1:

More cyclists, more safety!
It is safer to cycle in Copenhagen than in most other big cities. There are two reasons for this: In the first place the infrastructure is adapted to accommodate cyclists, including such facilities as an extensive cycle track network and bicycle-friendly intersections. Secondly, the large number of cyclists in Copenhagen means that the city's other road users are used to cyclists on the street scene and show them consideration.

Source: City of Copenhagen Cycle Policy 2002-2012

More cyclists also result in governments installing more safe cycling facilities. Countries with high levels of cycling such as Denmark and the Netherlands have a much lower rate of fatalities and serious injuries per head of population than is the case in Western Australia.

3.7 Economic Advantages

Cost savings to Governments

Constructing safe connected cycling facilities is much less costly than constructing roads to meet capacity needs for the growing population. In addition, major savings can be made in the health budget through improved health and fitness.

Less cost to individuals

The RAC WA has estimated the annual cost of car ownerships in WA is:

Small vehicles – more than $8,000;

Medium vehicles – more than $10,000;

Large vehicles – more than $12,000.

Families or individuals who are able to reduce car ownership can make a substantial saving.


PLEASE SHARE
KEEP LEFT
RING BELL
BEFORE PASSING

4. Data Collection

4.1 Current Cycling Environment

4.1.1 Cycling in Perth – Past and Current Trends

In the early 1990's the mode share of travel by bicycle in Perth was 5.7% and growing (Perth Metropolitan Transport Strategy, 1995 and Perth Bicycle Network Plan, 1996). The Perth and Regions Travel Survey (2003 – 2006) estimated that the mode share of cycling in Perth and Peel was 1.75%. The mode share for the different regions is shown in **Table 4.1.**

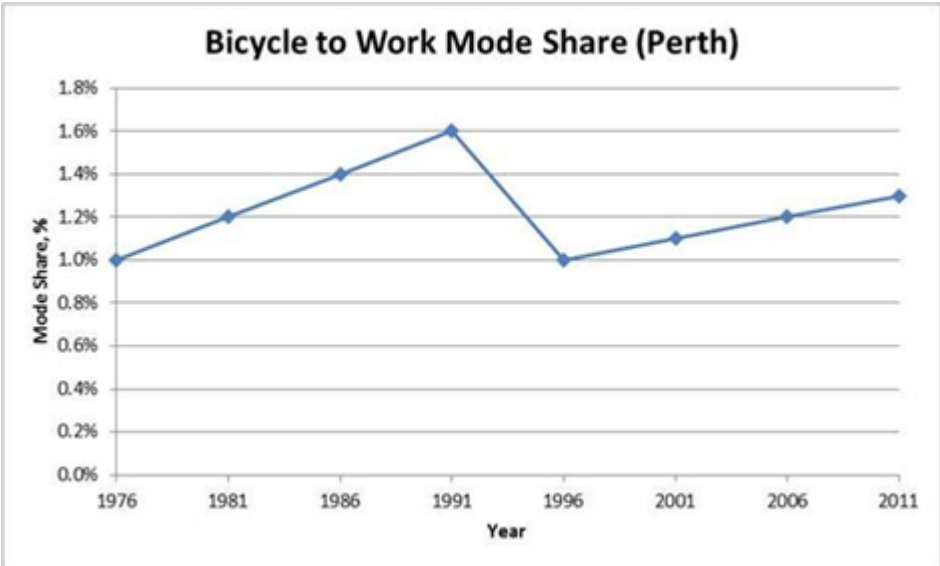
Table 4.1: Bicycle mode share by region (2003 / 2006)

Region	Bicycle mode share
Inner Middle	1.9%
North West	1.8%
Eastern	1.2%
South East	1.9%
South West	1.3%
Peel	3%
Perth and Peel total	**1.75%**

Source : PARTS Key Findings Report

The ABS journey to work data for Perth provides trends for journey to work mode share by cycling dating back to 1976 (Refer **Figure 4.1**).

Figure 4.1: Bicycle to Work Mode Share (Perth Metropolitan Area)



Cycling mode share was growing rapidly at about 4% per annum between 1976 and 1991. It dropped 60% between 1991 and 1996. Since then it has been growing at about 2% per annum, but is still 18% less in 2011 than it was 20 years ago.

The journey to work encompasses roughly 20% of all travel. The reduction in travel by bicycle for work trips, whilst substantial, has been less than for all travel. This is due to a very large reduction in travel by bicycle to school and other bicycle trips by young people, since the early 1990s.

The reduced level of cycling since the early 1990s has occurred because of increased concern for safety when cycling in mixed traffic, and because, in 1992, it became compulsory to wear a helmet when cycling in Australia. Compulsory wearing of helmets was, of course, introduced to provide a greater level of safety for users, but it also emphasised the danger element in cycling. A large number of cyclists, including children and their parents, found helmet wearing to be inconvenient or uncomfortable and made a decision to travel by other means. There was a major reduction in the level of cycling by both adults and children during the mid to late 1990s.

The recent growth in cycling has not been uniform in different regions of the city. In common with other cities in Australia, the growth in cycling has been highest in the inner city areas. To demonstrate this Jacobs analysed cycling to work in 4 groups of councils in Perth:

- Inner Councils – Vincent, South Perth, Victoria Park, Subiaco and Cambridge.
- Middle Councils – Stirling, Melville, Cockburn and Canning.
- Outer Councils – Joondalup, Kwinana and Rockingham
- Edge Councils – Mandurah, Swan, Armadale and Wanneroo.

The change in mode share of cycling to work in these groups of Councils is summarised in **Table 4.2.**

Table 4.2: Bicycle Journey to Work, Mode Share Changes

	2011 Population	2001 Bicycle Mode Share	2011 Bicycle Mode	Growth in Mode Share
Inner Councils	149,966	2.5%	3.8%	50%
Middle Councils	466,899	1.1%	1.4%	22%
Outer Councils	285,788	0.6%	0.6%	0%
Edge Councils	392,737	0.65%	0.5%	(22%)
Perth and Peel Metro Area	1.83m	1.1%	1.3%	22%

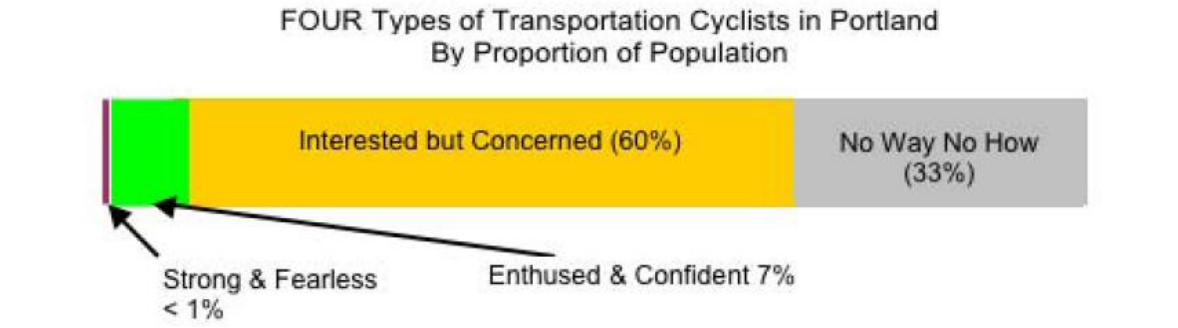
4.1.2 Reasons for Low Levels of Cycling in Wanneroo

Comments received from the community workshops refer to the fear of injury and stress from riding on the road network. There is no connected off street cycling network in Wanneroo and virtually all cycle journeys would need to be undertaken in mixed traffic on the road network. Furthermore, most of the connected distributor network has been designed specifically for motor vehicles to travel at fairly high speed. Intersections are generally designed with large turning radi that encourage drivers to turn at relatively high speeds.

Research undertaken elsewhere shows that fear of injury and stress from riding on the road network is a major barrier to cycling. Pucher et al (2010) references a 2006 City of Sydney survey of 1150 residents living within 10km of the CBD. The survey showed that “perceived traffic danger is the primary reason why non-regular cyclists do not cycle more often”

The Mineta Transportation Institute in the United States has undertaken research that links low bicycle use with high levels of stress associated with riding a bike close to motor traffic. It notes perceived danger as the main stress factor also notes that noise and exhaust fumes are a major contributor. A major finding of the research is that people have different levels of tolerance for traffic stress. The report references Gellers’s four types of transportation cyclists in Portland **(Figure 4.2).**

Figure 4.2: Portland's four types of transportation cyclists



Source: Mineta Transportation Institute (2012)

Surveys in Portland show that 67% of the population have an interest in cycling but much smaller percentages are willing to cycle close to traffic.

- "Strong and fearless" – respond well to riding in almost any traffic conditions
- "Enthused and confident" – don't show the same tolerance for mixing with fast turbulent traffic but respond well to riding in bike lanes along arterial streets and to sharing smaller roads with traffic.
- "Interested but concerned" – uncomfortable negotiating with traffic but respond well to stand alone paths and on streets with little and slow traffic.

It is fairly obvious from the usage survey results that only the "strong and fearless" are cycling in Wanneroo at present.

The low density of housing and the larger distances between houses, work places and other activities is a supplementary reason for low levels of cycling in Wanneroo.

The main strategies to reverse this low cycling usage in Wanneroo are discussed in **Section 6.** They include creation of a network of safe off street bike paths over time and development of 30kph bike boulevards along local streets.

4.2 Current Mode Share

75% of the City of Wanneroo's commuting residents drive to work by car

The journey to work census data is the only longitudinal data available to outline cycling trends in Wanneroo.

Table 4.3:Population figures and various modes for journeys to work (City of Wanneroo)

Year	Population	Dwellings	Car (Driver)	Car (Passenger)	Public Transport	Walking	Cycling	Other	Total
2001	80,008	29,277	21,842	2,202	2,104	403	122	1,340	**28,013**
2006	110,940	41,619	32,621	3,187	3,804	535	126	1,726	**41,999**
2011	152,077	56,334	46,756	4,443	6,852	932	240	2,948	**62,171**

Table 4.4: Percentage of journeys to work, by modes of transport (City of Wanneroo)

Year	Population/ Dwellings Ratio	Car (Driver)	Car (Passenger)	Public Transport	Walking	Cycling	Other
2001	2.73	78.00%	7.90%	7.50%	1.40%	0.44%	4.78%
2006	2.67	77.67%	7.59%	9.06%	1.27%	0.30%	4.11%
2011	2.70	75.21%	7.15%	11.02%	1.50%	0.39%	4.74%

As is the case for all municipalities in Perth the mode share of cycling for all trip purposes will be higher than for journey to work trips due to higher mode share for school trips. Although no accurate figures exist, the overall mode share of cycling in Wanneroo is likely to be about 1% which is about half the level for metropolitan Perth as a whole and about a quarter the rate in inner municipalities. Furthermore the mode share of cycling to work is about 10% less in 2011 than it was in 2001.

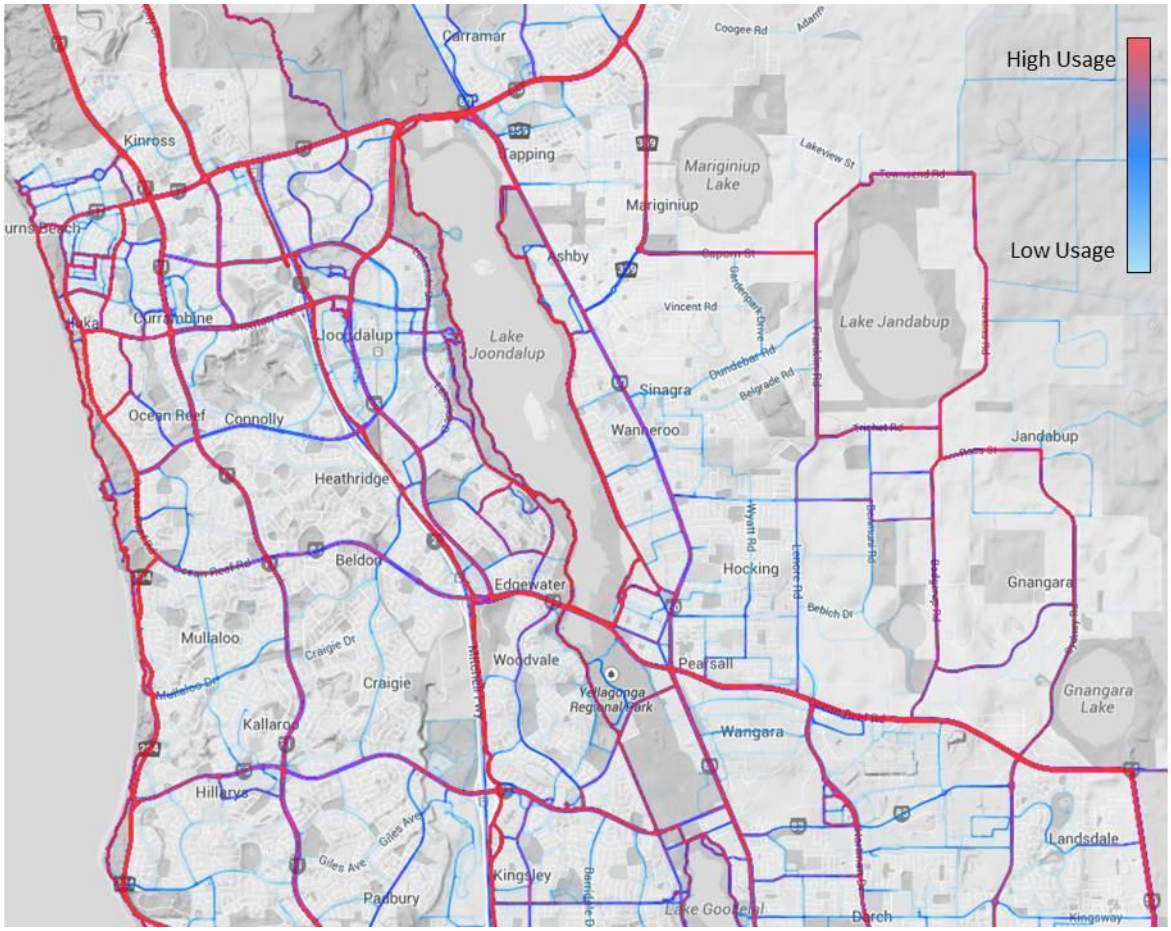
It is recommended that data collection is conducted on a regular basis – cycle surveys every 3-5 years to track changes in behaviour across all cycling trips.

4.3 Strava

Figure 4.3 below provides a "heat map" of bicycle use in Wanneroo. The source of this information is strava, a website and mobile app used to track athletic activity via GPS. Whilst the "heat map" shows the most popular routes used by cyclists and an indication of distribution, it cannot be used to quantify use because it only records those trips made by people who have registered the software. A recent ECU study found that approximately 30% of cyclists use strava – http://aushiker.com/strave-app/

Cycling is one of the most popular activities traced using the software. Strava provides a ranking of cycling routes that have been used by cyclists. Jacobs have gained access to Strava and plotted the latest heat maps within the Wanneroo Region. These will be used to assess the existing bicycle network and determine the missing links to major attractors.

Figure 4.3: Strava heat map



4.4 Cycle Counts

There are currently 28 fixed bicycle counters at various locations across the cycle network in the Perth Metro Area. The Department of Transport (DoT) in conjunction with Main Roads WA (MRWA) have been installing these counters since 2009 and have provided the data to the public and other stakeholders on a regular basis. The counters collect bicycle count data 24 hours per day, 365 days per year. Note that no fixed counters are within the City of Wanneroo.

As part of this study a series of counters have been laid to collect local cycle trip information on numbers and direction of movement. See Appendix A for a table of the full results from the counters. The counts confirm other data sources that show cycling numbers in Wanneroo are low.

Importantly this information has helped guide the identification of missing links and this shows that Scenic Drive has the highest demand for cycling in Wanneroo at present.

The figure 4.3 shows the importance of direct cycling routes and provision of separated facilities is needed, with many comments received on the safety concerns, the focus for cycling must be on segregated connected networks

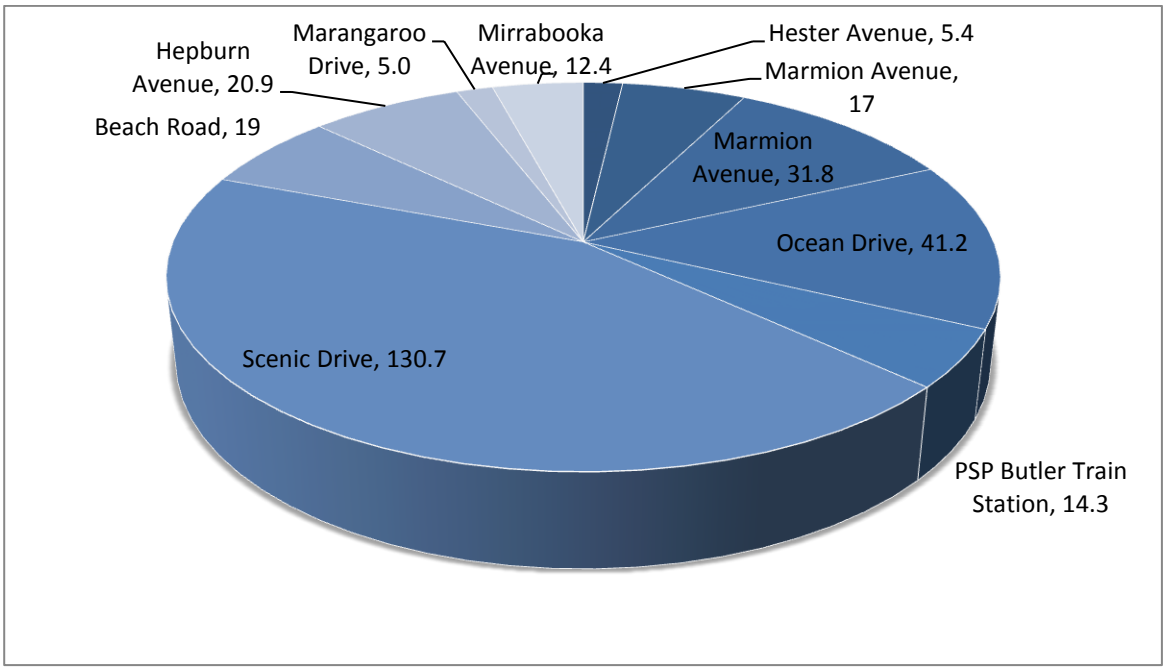


Figure 4 Cycle count Data Average Daily Counts

4.5 Crash Data

A review of the existing cycling network is a major element of the bike study. Generating an inventory of key routes, potential facilities and identifying the quality of these facilities is fundamental to taking the bike plan forward.

- Identifying barriers to cycling and accessibility
- Identify areas where infrastructure improvements will have the greatest benefit
- Assist in route planning
- Form the basis for softer measures e.g. maps, travel guides
- Encourage more people to cycle as their primary mode in line with the objectives of the Government's Smarter Travel policies

A review has been conducted of existing cycling facilities (on and off road) within the City taking into consideration the current users of facilities as well as the ability of the existing facilities to meet the demands of future users.

The plan has identified key missing links and upgrades to the current network that are recommended as required to complete the ultimate network map and links to key attractors.

This work has led to the development of a prioritised list of all projects using a multi-criteria analysis. Strategic intent, connectivity and safety should attract a higher weighting when prioritising projects. As referenced in the brief an example of an appropriate multi-criteria assessment tool is the Cycling Environment Review System (CERS).

It is noted that the crash data only includes reported crashes.

Appendix B shows a table of all the bicycle involved crashes in the past 5 years. There have been 32 crashes in the City of Wanneroo in the past 5 years involving a cyclist. Given the low numbers of cyclists and low numbers of crashes it is difficult to draw specific conclusions from these statistics. However, it can be seen that the great majority of crshes are right angle and 94% on carriageway.

MR Nature	%
Right Angle	47%
Side Swipe, Same Direction	19%
Non-Collision	9%
Right Turn/Through	9%
Rear End	6%
Unknown	9%

Figure 4.5: Types of Crashes

Of the crashes recorded, 94% occurred on the carriageway and 6% occurred on the sidewalk.

- 38% resulted in hospital treatment
- 25% resulted in medical treatment
- 28% resulted in minor property damage only (PDO Minor)
- 9% resulted in major property damage only (PDO Major)

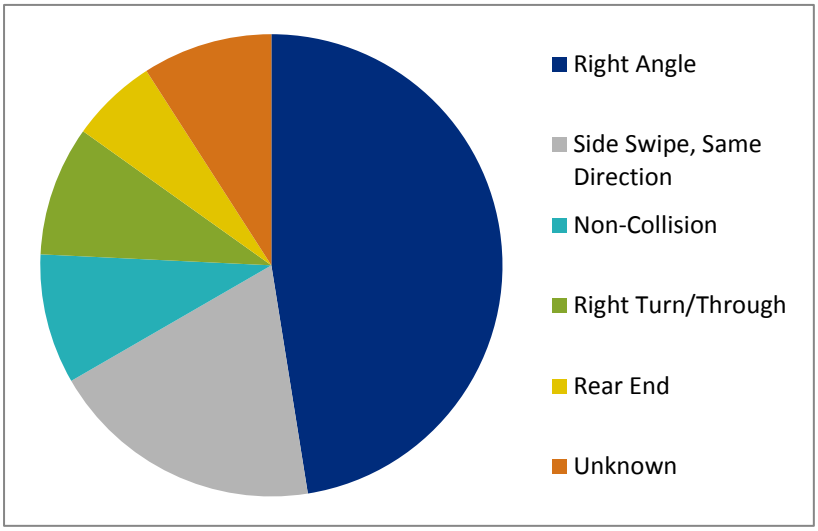
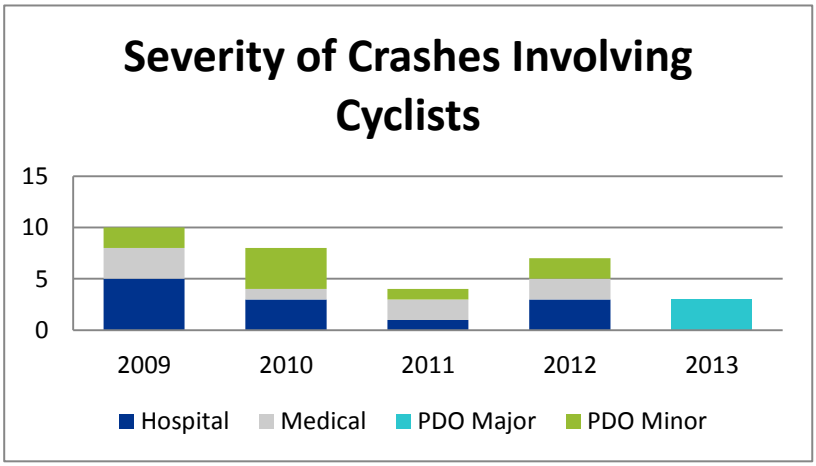


Figure 4.6: Severity of Crashes Involving Cyclists



4.6 Technology and ITS Development

The use of technology can play a major part in both developing new cycle infrastructure, improve the planning and target investments. Most people have a mobile phone capable of running an application which can record basic details of your trips, distance, and speed and anonymously uploads them to the Bicycle Network website. All the travel logs are then aggregated to show when, where and why we are riding.

5. Review of Past Strategies, Policies and Practices

5.1 Planning

It is important to position cycling within an integrated and sustainable transport strategy and to ensure visibility is achieved from a strategic point of view. Cycling must therefore be looked at within the context of all other relevant plans, thus a review of the following plans has been carried out.

5.1.1 Strategic Community Plan

- *Objective 1.1 – Environmentally Friendly*
    - *Minimise impacts of climate change*
    - *Encourage environmentally friendly development*
- *Objective 2.1 – Great Places and Quality Lifestyle*
    - *Create places people are happy to live in*
    - *Provide a range of quality facilities and services*
- *Objective 2.2 – Healthy and Active People*
    - *Create opportunities that encourage people to be active and healthy*
    - *Provide physical environments that encourage healthy activity*
- *Objective 3.3 – Easy to get Around*
    - *Deliver major transport infrastructure*
    - *Develop local roads and paths*
    - *Increase walking and cycling opportunities*

5.1.2 Corporate Business Plan

The 4 Year Corporate Business Plan contains the same objectives and strategies as the Strategic Community Plan above.

The Corporate Business Plan is relevant to the Wanneroo Cycle Plan as it includes objectives related to the City's transport assets, including cycling infrastructure.

The strategies in the Corporate Business Plan relevant to the Wanneroo Cycle Plan are:

- Create opportunities that encourage people to be active and healthy;
- Provide physical environments that encourage healthy activity; and
- Increase walking and cycling opportunities.

5.1.3 Community Health and Wellbeing Program

The Community Health and Wellbeing Policy is strategically aligned to the City's Strategic Community Plan with the purpose of the Policy being to:

- Provide a framework for the provision of services, facilities and opportunities to the community in order to maintain or improve community health and wellbeing;
- Develop a connected and involved community which promotes health and wellbeing and community safety; and
- Promote a supportive culture where healthy lifestyle choices are valued and encouraged in the community

The Policy contains mutual objectives to the Wanneroo Cycle Plan including encouraging the community to meet their Australian physical activity guidelines. Getting more people cycling is one way to help achieve this objective.

5.1.4 Local Planning Policies

5.1.4.1 LPP 3.2 – Activity Centres

This policy has been prepared in order to provide guidance on the planning and development of activity centres in the City of Wanneroo through district, local and centre structure plans, amendments to DPS 2, detailed area plans and applications for planning approval.

Relationship to Bike Plan

The policy plans to achieve a legible and efficient pedestrian, cycling and vehicle network within activity centres and maximise opportunities for sustainable transport options, including walking, cycling and public transport, while minimising the need for private vehicle trips.

This will be achieved across the three levels of structure plans by:

District structure plans should locate activity centres of district classification and above connected by:

- regional cycle and pedestrian linkages;
- high frequency public transport; and
- Roads classified as District Distributor B or above in Liveable Neighbourhoods.

Local structure plans should include a map showing activity centres that are connected by:

- cycle and pedestrian linkages;
- public transport; and
- Roads.

Centre structure plans should:

- provide for cycle lanes in accordance with Liveable Neighbourhoods;
- indicate the indicative location of bicycle storage facilities; and
- Designate Business, Commercial and Mixed Use zones, in locations that provide opportunities for walking, cycling and public transport.

Proposals to rezone land to the Business, Centre, Commercial or Mixed Use zones should provide opportunities for walking, cycling and public transport including end of trip facilities.

5.1.4.2 LPP 5.2 – Wanneroo Town Centre

The purpose of this Policy is to expand and elaborate on the existing Wanneroo Town Centre Structure Plan provisions to provide greater control and influence over development outcomes and the quality of built form in the Town Centre. Wanneroo Town Centre is considered to be a District Centre in Directions 2031 and should have well connected cycle routes.

Relationship to Bike Plan

This policy states that structure plans must provide a well-connected movement network that maximises access to and within the Town Centre by walking, cycling and public transport while reducing private car trips. This is to be achieved by maximising levels of short term on-street parking in the public realm, and rationalising on-site parking in order to promote viable development and encourage the use of alternative modes of transport.

5.1.4.3 LPP 3.4 – Smart Growth

The Smart Growth Policy sets out 4 goals:

Goal One: Environmental Sustainability

To value, protect and enhance our natural environment in harmony with the growth and progress of our city.

Goal Two: Healthy Communities

To foster an identity that promotes lifestyle choice and provision of quality services and infrastructure.

Goal Three: Economic Development

To maximise opportunities for balanced economic growth and development within the City.

Goal Four: Corporate Management and Development

To create a culture that is committed to corporate learning, evolution and proper management of our natural, financial and human resources.

Title:	
Overview	Smart Growth has been developed to ensure the growth of the City of Wanneroo is managed through effective use of resources to improve the quality of life for current and future residents, support the local economy and minimize environmental impact.
Approach	The Smart Growth approach would involve working toward more sustainable practices through such an integrated application of environmental, social and economic principles (through the use of 'sustainability assessment'), and a seeking of solutions which are mutually supportive of those principles. Such integrated assessment should also ideally occur during the course of the planning phase of projects, rather than upon submission of the proposal for approval.
Findings	The Smart Growth Discussion Paper found that although the City's Strategic Plan was seeking to improve sustainability, the growth of the city in its current form would not be considered sustainable.
Conclusions	To achieve the vision set out by the Strategic Plan, 52 strategies were proposed in Smart Growth.

Relationship to Bike Plan

Principal Strategy:

Promote a variety of alternative transport choices to reduce energy consumption. This is to include:

- Encouraging the use of alternative modes of transport other than private vehicles, such as bicycles and public transport.

- Encouraging the development of walkable neighbourhoods that are easy to navigate on foot or by bicycle.
- Promoting effective and accessible public transport infrastructure and promoting alternative transport usage programs.

Encourage interconnectedness between neighbourhoods. This is to include:

- Lobbying for more effective transport options in our region
- Building community meeting places

5.1.4.4 LPP 4.3 – Public Open Space (inclusion of cycling facilities in public open space and improved guidance on how cycling facilities should be built – most cycling facilities in public open spaces cannot be used for transport due to their meandering nature)

It is recommended that as part of the next policy review the following be included in the policy to promote the objectives of the Bike Plan –

- Bike racks to be provided in parks that are classified as neighbourhood POS and above to encourage and support local bike trips.
- Provide guidance on the design of cycle paths in POS to ensure they focus primarily on providing a safe and direct route for cyclists

5.1.4.5 LPP 4.11 – Pedestrian Access ways (no closures of pedestrian access ways – PAW's are important for inexperienced cyclists and also provide a priority to cyclists over vehicles)

5.1.4.6 LPP 3.3 – Northern Corridor Growth Development Contributions (inclusion of cycling facilities in public open space developments

5.1.4.7 LPP 4.2 – Structure Planning

5.1.4.8 LPP 3.8 – Marmion Avenue Arterial Road Access – recommendation

This Policy prescribes acceptable standards for the type and location of vehicular access points, provisional standards for cycling infrastructure, and operational procedures for all new planning proposals.

Relationship to Bike Plan

Create sufficient access opportunities to regional and district centres, which include crossing points for all modes of transport (including pedestrians) and safe access for vehicles accessing the centres.

A safe network of pedestrian and bicycle crossing points will be provided to link communities across major roads and provide safe access to regional and district centres. Major pedestrian crossing points will generally be provided under traffic signal control, but grade separated crossings will also be considered where the geometry is supportive.

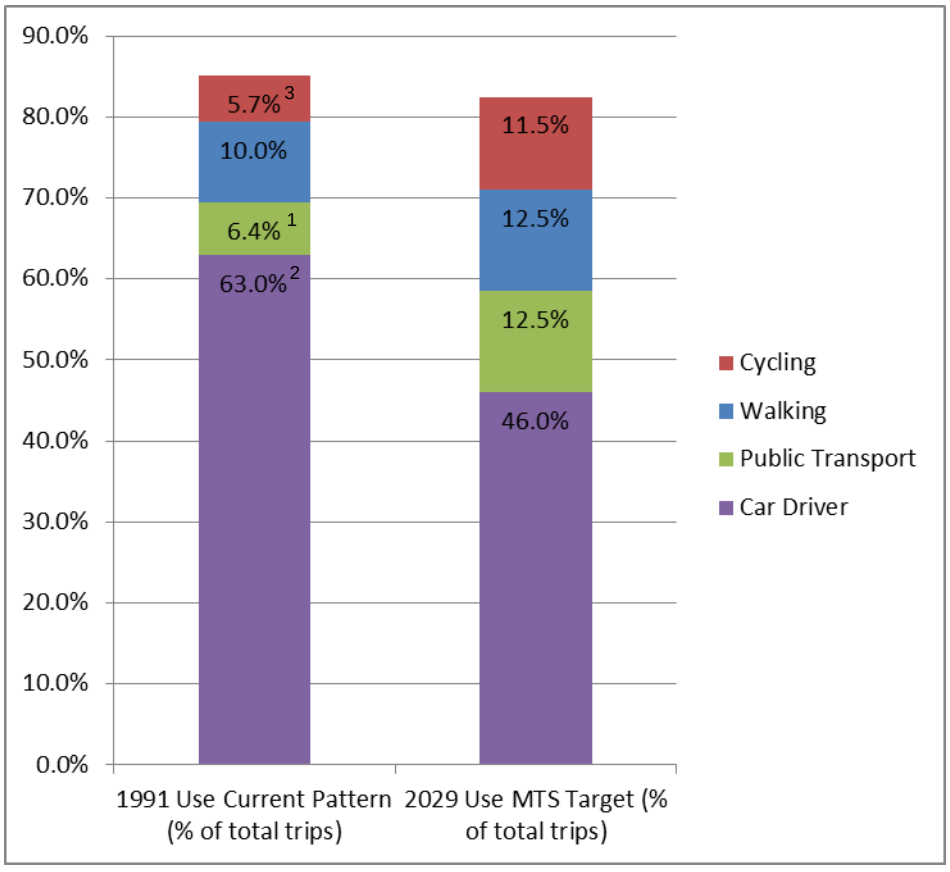
Clearly defined cycle paths, at widths specified, are required for both sides of roads in the applicable area. Acceptable designs will include:

- On-road cycle lanes and physically separated dual use paths; or
- Physically separated dedicated cycle paths and pedestrian paths.

5.2 Metropolitan Transport Strategy, 1995

The Metropolitan Transport Strategy (MTS) was released in 1995 to guide transport planning in Perth through to 2029. One of its objectives was to reduce dependence on private cars for many trips by increasing the availability and competitiveness of alternative transport modes, including public transport, walking and cycling. The MTS set targets to increase travel by cycling from its early 1990s mode share of 6% to 12% by 2029. Achievement of the MTS modal targets would enable the proportion of car driver travel to be reduced to 46% by 2029 (see **Figure 5.1**).

Figure 5.1: Perth metropolitan transport strategy mode share targets (adapted from the Perth Metropolitan Transport Strategy 1995-2029)



The proposed reduced proportion of travel by car was a significant change in the transport policy designed to enable improved accessibility for all, whilst mitigating congestion at an acceptable cost.

5.3 Western Australian Bicycle Network Plan

The Western Australian Bicycle Network Plan 2014-2031 (WABN Plan) was developed to guide the expansion of metropolitan and regional cycling facilities in Western Australia. The plan itself includes new initiatives which cover a range of activities to efficiently provide a safe and sustainable cycling network which links the key activity and attraction areas.

[1] Proportion of travel by public transport continued to decline until 1999 to 4.5% but has grown to 7% by 2015.
[2] Proportion of travel by a car driver was 58% in 2006 (PARTS study) and has continued to decline (2015 estimate 57%).
[3] Proportion of travel by bicycle reduced significantly in the early 1990s due largely to introduction of compulsory helmet wearing and has not fully recovered.

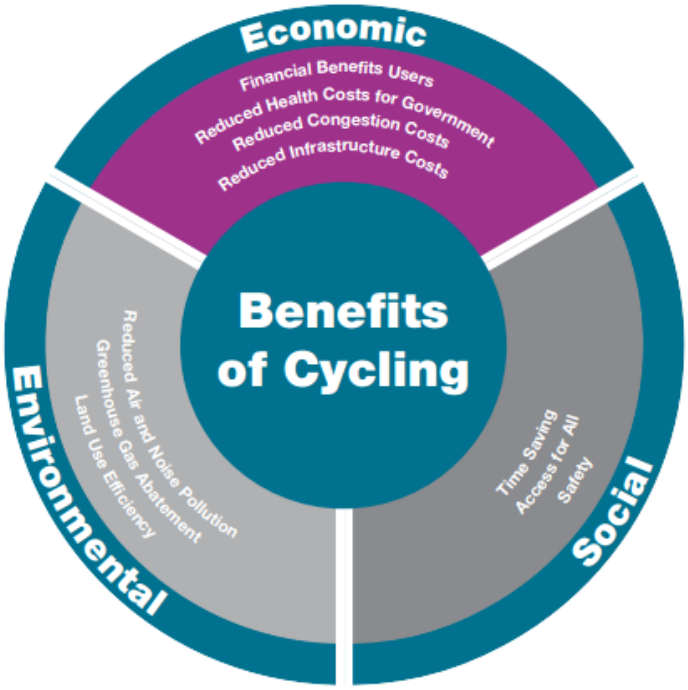
The vision is to make WA a place where cycling is safe, connected, convenient and a widely accepted form of transport. The plan sets a target to double bicycle usage within 5 years of the plan release (ie. by 2019). However, because the majority of the emphasis is on inner areas and the network is poorly connected in Wanneroo a target mode share of 4% by 2019 seems unlikely. A more realistic target is 3% bicycle mode share by 2020 and 5% by 2031.

There is a specific focus on connections to schools, stations, activity centres and generating cycle tourism.

The key actions of the WABN Plan are:

- Expansion of the Principal Shared Path (PSP) Network
- Review of Local Bicycle Routes (LBRS)
- Perth Bicycle Network Grants Program
- Regional Bicycle Network (RBN) Grants Program
- Central Business District Cycling Projects
- Review of Traffic Management on Local Roads
- Connecting Schools
- Connecting Stations
- Planning for Cycling Facilities in the Regions
- Development of a Bicycle Counting and Monitoring Strategy
- Development of an Online Journey Planner
- End-of-Trip Facilities

Figure 5.2: Benefits of Increasing Cycling in the Community (Source: Western Australian Bicycle Network Plan)

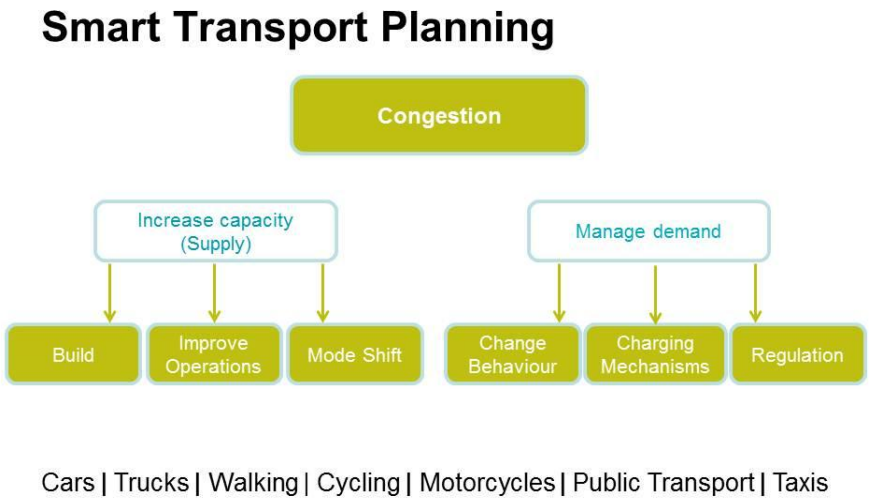


The Principal Shared Path Programme, as outlined in the WA Bicycle Network Plan is to complete all paths within 15km of the CBD by 2024, and the remainder of the PSP network, including the section through the City of Wanneroo, between 2023 and 2031.

5.4 Moving People Network Plan

Current integrated transport planning seeks to mitigate congestion by increasing the capacity of the networks (supply) and by managing the demand for travel (see **Figure 5.3**).

Figure 5.3: Smart Transport Planning (2015)

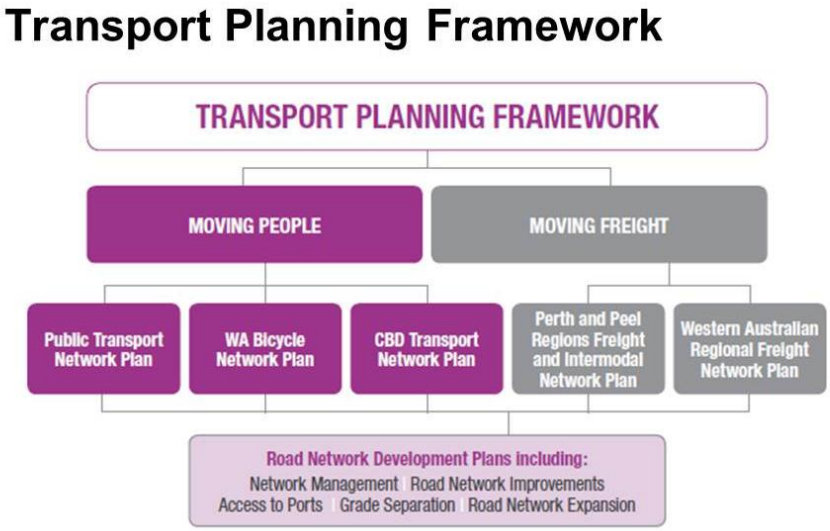


The emphasis is on moving people and moving freight rather than moving vehicles. A key component of the current transport policy is to increase the capacity of the network by moving more people in less vehicles. Overall network efficiency is improved because the space occupied by vehicles moving the same number of people is reduced (see **Figure 5.4**).

Figure 5.4: Walk over October poster showing the space requirement for cyclists compared to cars (City of Fremantle)

Figure 5.5 provides an outline of the current network transport planning framework.

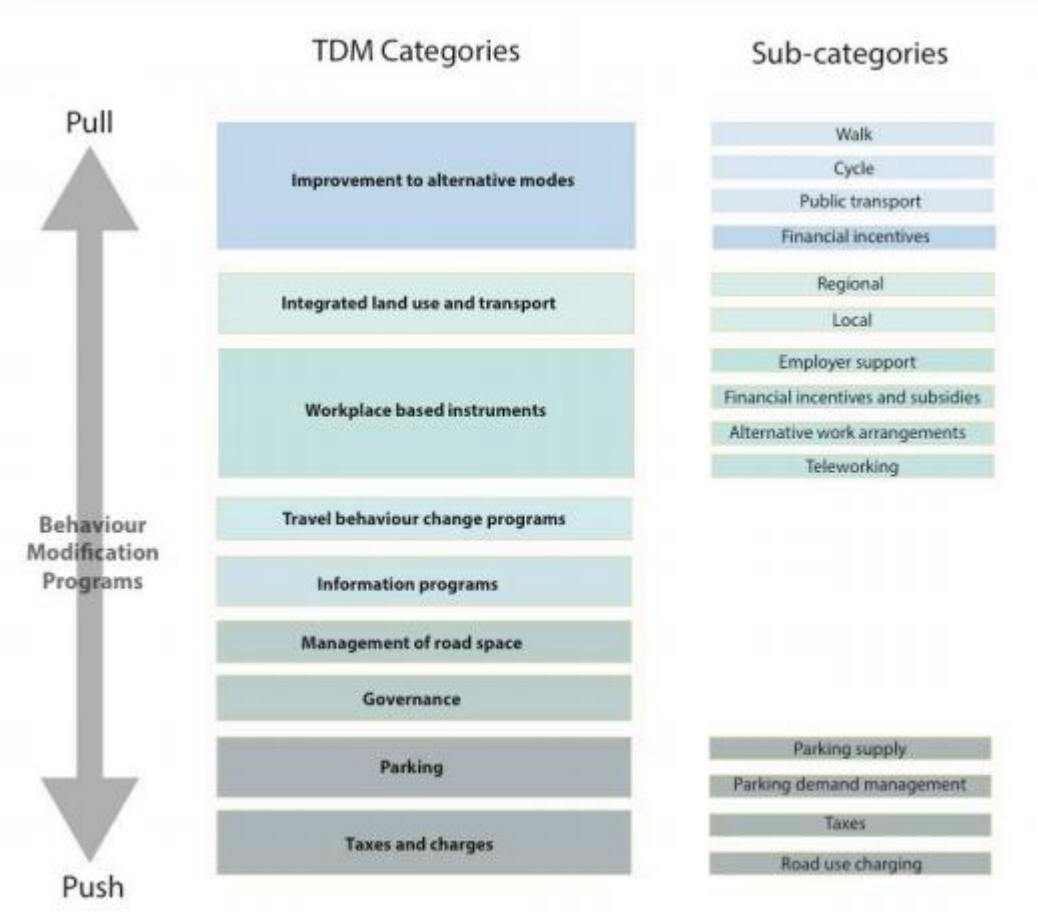
Figure 5.5: Transport Planning Framework (2015)



5.5 Demand Management and Travel Smart

PATREC (2014) in its report “Congestion Abatement Through Travel Demand Management” has identified nine categories of TDM.

These instruments are shown below along a continuum of push and pull instruments.



Source: PATREC (2014)

Push instruments aim to reduce the relative attractiveness of driving a single occupancy vehicle, whereas pull instruments represent incentives to encourage choices away from private car travel by improving the availability or quality of the alternatives. All of these measures, to a greater or lesser extent, can have the effect of improving the level of cycling.

The State Government, through the Department of Transport, actively supports TDM as a means of reducing congestion and improving health and fitness.

5.5.1 Travel Smart

The Department of Transport introduced its TravelSmart programme in the late 1990s. Over the years its flagship programme has been Household & Travel Smart (using Individualised Marketing). Individualised marketing had been used in Europe for a number of years to increase travel by public transport. However, in a world first, it was introduced in South Perth to also include walking and cycling under the name Travel Smart. It has since been used in other cities in Australia and overseas with considerable success in reducing single car driver use and increasing the amount of walking, cycling and public transport. **Table 5.1** below summarises the results of where individualised marketing was undertaken in eight suburban areas with a combined population

of 143,000 people. The percentage results for cycling, whilst encouraging, need to be considered with some caution since the base numbers are very low.

Table 5.1: TravelSmart Individualised Marketing Results for Perth

	Sth Perth	Cambridge	Subiaco	Marangaroo	Fremantle	Melville	Vincent	Armadale
Population	35,000	24,000	15,000	11,000	17,000	19,000	15,000	7,000
Car trips	-14%	-7%	-12%	-4%	-12%	-12%	-9%	-9%
Car km	-17%	-9%	-16%	-7%	-14%	-13%	-12%	-11%
Bike trips	+61%	+67%	+25%	+140%	+38%	+75%	+30%	+29%
Walk trips	+35%	+11%	+11%	+57%	+25%	+22%	+22%	+45%
Bus patronage	+20%	+10%	+12%	+8%	+14%	+11%	+10%	+9%

A number of other demand measures have been introduced in Perth under the general brand of TravelSmart, including:

- **TravelSmart Schools.** These programmes are particularly relevant to cycling and have achieved results of up to 20% reduced car driving, mainly through encouraging more walking and cycling.
- **Workplace Travel Smart.** This is a voluntary programme whereby major workplaces sign up to the scheme with the Department of Transport. Up to 30% reduction in commuter car trips have been recorded mainly through greater use of public transport, cycling and walking/jogging.

5.5.2 Travel Plans

Travel plans are often required as a condition of development for major centres, office developments or retail expansion. Following negotiation developers are required to implement measures such as improved and safer bicycle access and provide a greater level of bicycle parking and other end of trip facilities such as lockers and showers.

5.5.3 Your Move

The City in partnership with the Department of Transport and the Department of Sport and Recreation are delivering a joint behaviour change programe, Your Move, in 2015. Your Move is an active lifestyle program delivered jointly by the Department of Transport and the Department of Sport and Recreation. Your Move is all about helping people to find simple ways to get active and connected. Your Move offers information and support tailored to people's lifestyle to make it easier to get active their way.

The program targets selected local government areas, across the metropolitan area. The program aims to reduce car trips, alleviate local traffic congestion, increase public transport patronage, increase physical activity and improve the health and wellbeing of targeted communities. In 2014, Your Move in Cockburn resulted in 410,000 fewer car trips per annum.

Each project helps people to achieve their active transport and physical activity goals through providing tailored information and resources as well as personalised phone coaching and feedback on progress.

Your Move is currently being offered to residents of the City of Wanneroo. The Your Move Wanneroo Project will commence in April 2015 and will aim to recruit 10,500 households. Each household will receive a personalised resource pack providing participants with necessary tools and information to get started on achieving their active transport and physical activity goals. Your Move provides the City with an excellent opportunity to encourage the use of alternative transport methods and create demand for cycling infrastructure within the City of Wanneroo.

The programme will be delivered in the City of Wanneroo from April to December 2015. By 12th May 2015, 3900 Wanneroo residents had signed up for the programme.

6. Community Engagement

6.1 Community and Stakeholder Engagement

A number of community and stakeholder discussions were carried out as part of the development of the 2015-2020 Bicycle Plan, which enabled community engagement and gave an opportunity for residents and bicycle users to make observations and provide commentary. This engagement included multiple stakeholder and community workshops. The following provides an overview of those consultations:

6.1.1 Community Engagement

As part of the Wanneroo Bike Plan, the City held three community workshops:

1) 24 March 2015, Hainsworth Community Centre

2) 25 March 2015, Butler Community Centre

3) 30 March 2015, Wanneroo Library and Cultural Centre

These workshops were well attended by various age groups with varying levels of cycling abilities and interests. Key issues raised at these workshops were:

- Cyclist safety, particularly at numerous roundabouts within the City
- Education – both for cyclists and motorists
- Training and racing facilities
- Mountain biking facilities
- The need to differentiate between commuting/sporting cyclists and recreational cyclist/pedestrians
- Maintenance of existing infrastructure, in particular dealing with debris
- Connectivity of cycle paths, including the Freeway PSP and connecting Jindalee to Yanchep

6.1.2 Key Stakeholder Engagement

An internal stakeholder workshop was held with the City of Wanneroo along with other internal stakeholders on 18 December 2014 to discuss the proposed bicycle network. The key stakeholder workshop was held on 23 March 2015 with the City of Wanneroo, Department of Transport, Local Governments, RAC, Main Roads, Bicycle user groups, and representatives from the City.

The main issues highlighted at this meeting were:

- Missing local network links in Clarkson, Merriwa and Wangara
- Connections to train stations from Marmion Ave

6.1.3 Wanneroo Internal Steering Group

The City of Wanneroo convened an internal Steering Group to facilitate the development of the Bike plan. This involved a series of workshops inviting the Department of Transport and key stakeholders to provide an understanding existing cycling level, current network and particularly barriers to cycling for the vast majority of people who do not cycle. The steering group set the targets and developed strategies to increase the mode share of cycling in Wanneroo

6.2 Community Identified Network Improvements

The three community events resulted in unanimous support for a bicycle plan and that bicycle planning is viewed as important across the City and should be a real focus for a serious mode for the region.

The three workshops discussed current planning, aspirations and infrastructure gaps and the outcomes from each are scheduled below;

Hainsworth Community Centre, 24 March 2015
Lake Joondalup Circuit Trail – Yaberoo Budjara Heritage Trail • SE Corner - Tyne Crescent path behind houses, 150m missing • NE Corner – Missing link

Butler Community Centre, 25 March 2015
1. Freeway PSP connectivity 2. Safer roundabouts 3. Debris on paths 4. Training/Racing/Velodrome/Criterium Paths 5. Education

Wanneroo Library and Cultural Centre, 30 March 2015
1. Improve mountain biking facilities, similar to Kalamunda 2. Educate motorists 3. Security 4. Maintenance 5. Events promoting cycling 6. Facility to park car, then cycle 7. Link trails to Yanchep

6.2.1 Maintenance

- Regular cleaning of the cycle lanes along Marmion Ave to free the lanes from debris
- Debris is a major problem near Tamala Park
- Trimming of bushes
- Remove debris
- Remove bushes from Yanchep Beach Road
- Drain covers

6.2.2 Connections

- Connect Wanneroo to Butler for the casual rider, not speed rider
- Need to link beach side of Marmion to Irene McCormack Catholic College and Butler College
- Wanneroo Rd needs a separated cycle path
- Connolly Drive needs a cycle lane with a proper surface

- Burns Beach Road underpass and crossing Connolly Drive is dangerous

6.2.3 Education

- Safely ride to school – laws around parents riding on footpath
- Bike education centre – primary, secondary, racing, time trials
- School run programmes – training and education
- Provide more education within schools to get kids riding
- Crossing guards on busy roads near schools
- High school safety awareness programme
- Cycling subject/sport/stadium at every school
- Building industry partnerships and education

6.2.4 Facilities

- Closed circuit (criterium circuit/velodrome) for cyclists in every suburb – differentiate between juniors and seniors
- NBC trailer?
- Training facilities for all times of the day
- Training facilities away from cars
- Cycling infrastructure that caters for a broad range of cyclists (eg. Brisbane river)
- Off road training facilities – kids to learn in safe environment, velodrome, racing circuits
- Club rooms
- Road race facilities
- Club Training Centre (Mindarie, Jindalee)
- Race Tracks (Mindarie/Quinns Rocks)
- Tube/Kit Repair Station (every 2km along Marmion Ave)
- Velodrome (Alkimos, Ridgewood)
- Bike Lockers
- More Safety
- More bush tracks

6.2.5 Traffic Signals

- Traffic lights that let cyclists go separate to the cars
- A “cycle crossing” to get across busy intersections if not on the road lanes
- Sensors in bike lanes/car lanes at traffic signals to give bikes priority
- Bike detector sensors at traffic signals

6.2.6 Roundabouts

- Cycle slipways at roundabouts
- Roundabouts on Connolly Drive don’t cater for cyclists
- Cycle lanes need to not disappear when a roundabout approaches

6.2.7 Other

- An underground tunnel under the train line that has exits at each station (bikes only)
- Raised side walks for bikes only
- Allow bikes on trains and buses at all times, dedicated train carriages for cyclists
- Peak hours need to allow bikes on trains
- Need to differentiate between recreational cyclists and sporting cyclists as sports cyclists will still want to use the road and road users will want them on the bike path
- Breakwater Drive surface needs to be upgraded
- Wider cycle lanes along Marmion Ave at every roundabout from Kinross to Yanchep
- More signage to advise drivers of cyclists using the bike lanes
- Need better lighting
- Wider lanes
- Wide cycle lanes on all main roads
- Smoother cycle path on Whitfords Ave
- Smooth road surfaces
- Lighting at stations
- Secure parking at communal centres such as shopping centres or sports venues
- Freeway bike path needs to be continuous and not go into housing estates
- Longer freeway cycle path
- Cycle paths away from cars
- Signage telling drivers the rights of cyclists
- Signs warning drivers to be aware of cyclists
- More driver awareness signs
- Cycle lanes on side roads
- Separate paths to pedestrians
- Regular maintenance of existing infrastructure (eg. Street sweeper)
- Dedicated on road bike lanes that are continuous
- More bike markings on roads (eg. Fremantle)
- Some cyclists travel at speeds not suitable for PSP
- End of trip facilities in ‘towns’
- Cycle maps
- Tourist promotion (eg. Cycle hire)
- Family cycling paths
- Need good parking facilities at the shops
- Edgewater Drive - Traffic calming narrow for cyclists

PART 2: Implementation Plan

Infrastructure Implementation Plan
5 Year Implementation Plan

7. 5 Year Implementation Plan

7.1 Strategic Improvements

Strategic Item	Description	Expected Year
Strategic Transport Plan	Development of a Strategic Transport Plan	2015 to 2020
Funding	Funding levels tied to population - $20 per head (recommended level from TFL)	2015 to 2020
Funding	Separate Pedestrian and cycling funding	2015 to 2020
Resourcing	Development of a cycling implementation strategy to guide the Cycle Plan. Increased resources and focus for cycling with a dedicated cycle officer.	2015 to 2020
Advisory Group	Development of a cycling Advisory Group for the City to guide the implementation of the City's Cycle Plan including technical staff, representatives from adjacent councils, elected members, representatives from cycling groups etc.	2015 to 2020
Cycling items in Committee agendas	Investigate a mechanism to ensure cycling is considered as part of all relevant council reports	2015 to 2020
Maintenance	Develop and implement an ongoing maintenance program from all cycling routes within the City	2015 to 2020
Median Treatments	Discontinue the use of median treatments on local distributors and access roads identified in the Cycle Plan	2015 to 2020
End of Trip Facilities	Recommendations for City of Wanneroo buildings (civic centre expansion) as well as requirements for developments	2015 to 2020
Establish a Skills and Education Programme	Skills proficiency across Wanneroo available to all.	2015 to 2020
Travel Plans	Travel Planning across business and workplaces	2015 onwards
Recommendations for Structure Plans	What we need to be requesting from developers as part of development applications	2015 onwards

7.2 Data Collection

Strategy	Description	Expected Year
Monitoring and Data Collection	Advocate for the collection and provision of adequate cyclist crash data for local governments	2015 to 2020
	Develop and implement a cyclist counting program to track changes in mode share including fixed counters, portable counters, community surveys and user data sources such as Strava	2015 to 2020

7.3 Investigations / Feasibility Studies

Strategy	Location	Description	Expected Year
Marmion Avenue Study	Marmion Avenue	Investigate the construction of a 4m wide cycling facility	2015 to 2020
Trails Plan Study and Review	City Wide	Investigate the development and improvements to the Trails network	2015 to 2020
Bicycle Boulevard Cycle Link to Clarkson	Mindarie to Clarkson	Demonstration Project	2015 to 2020
Implementation of Recreational Sporting Cycling Facility	Wanneroo	Investigate the development of a dedicated recreational cycling facility within the northern corridor (Cities of Joondalup and Wanneroo)	2015 to 2020
Recreational Sporting Cycling Facility		Investigate the development of a dedicated recreational cycling facility within the northern corridor (Cities of Joondalup and Wanneroo)	2015 to 2020
Lake Joondalup Cycle Paths		Environmental and feasibility study will need to be conducted for this project. Complete the missing links behind Drovers Place and close to Ocean Reef Road.	2015 to 2020

7.4 Behaviour Change Improvements

Strategy	Description	Expected Year
Cycle Training Schools Education	Improve cycling participation in schools by offering cycle training for those schools that participate in Travelsmart to Schools Program or similar travel behaviour change programs.	2015 to 2020
Way Finding	Develop and implement a cyclist Wayfinding program that includes route markers and safety advice	2015 to 2020

Strategy	Description	Expected Year
Bike Maintenance	Investigate the need to run cycling maintenance courses within the City of Wanneroo	2015 to 2020

7.4.1 Travel Smart and Catering for New Cyclists

One of the key elements to increase mode share is to cater for new cyclists. To increase the mode share of bicycle use for short-trips, catering for new cyclists is critical. Travel behaviour change programs promote multimodal travel alternatives to the single occupant vehicle (SOV) in order to reverse unsustainable traffic congestion and help with issues such as air quality and transport trends affecting rapidly growing urban areas worldwide.

Perth has been a leading city worldwide in the development of behaviour change programmes such as TravelSmart. Behaviour change programmes have the potential to influence people to travel more by bicycle and therefore should form a part of the Wanneroo bike planning.

As an example, in addition to the residential TravelSmart programme, there are a number of travel plans for cycling that can be developed collaboratively between major employers, education institutions and the like. It is proposed that these travel plans be co-ordinated within the bike planning and be targeted at increased usage by all the more sustainable modes of travel – walking, cycling and public transport.

7.4.2 Travel Plans

Travel plans should be included for: major tertiary education institutions; government departments and local governments; Major employers and schools.

In addition, it is suggested that a form of travel plan be developed for major transport hubs such as train stations, town or district centres, and shopping centres. Different approaches would be necessary for the different travel plans but the key themes would be:

- Plan and provide for sufficient end of trip facilities such as bicycle parking, lockers and showers;
- Provide information on the many benefits of cycling;
- Provide information on safe, convenient cycle routes in the vicinity;

Where possible negotiate employer incentives to encourage cycling, funded from savings in relation to their travel modes (e.g. car parking).

7.4.3 Bicycle Boulevard

Wanneroo has identified the need for both promoting and encouraging cycling and through the work on this plan there have been significant calls for a bicycle boulevard, particularly for the link between Mindarie and Clarkson station.

Such a scheme would significantly help this link, where there has been demonstrated demand for this and which would support a great many objectives and goals both for Wanneroo, Department of Transport and would support the encouragement of public transport, whilst reducing car mode shares and numbers. Such a project would be a low-speed street/corridor which is "optimized" for bicycle traffic. Bicycle boulevards discourage cut-through motor-vehicle traffic but will allow local motor-vehicle traffic.

This route would be designed to give priority to bicyclists as through-going traffic. They are intended to improve bicyclist comfort and/or safety. Those specific goals;

- discouragement of non-local motor vehicle traffic; encouraging cycling to a key network (Clarkson) train station;

- low speed limits;
- low motor-vehicle traffic volumes;
- free-flow travel for bikes by assigning the right-of-way to the bicycle boulevard at intersections wherever possible;
- traffic control to help bicycles cross major arterial roads; and
- a distinctive look and/or ambiance such that cyclists become aware of the existence of the bike boulevard and motorists are alerted that the street is a priority route for bicyclists.

These elements are intended to appeal principally to casual, risk-averse, inexperienced and younger bicyclists who would not otherwise be willing to cycle with motor vehicle traffic. This could is also be a relatively low-cost approach to appealing to a broader cycling group in Wanneroo.

7.4.4 Way Finding

On unfamiliar streets it is easy to get lost and to feel very vulnerable. This can be addressed with better signing, particularly by ensuring that on important cycle routes there are clear street name signs and other locators at junctions. Wayfinding is a lot more than connecting and identifying routes between A and B, it addresses all urban movement and behaviour, from orientation to exploration and even discovery. Its benefits predominately help cyclists in this instance but also visitors, residents and businesses and can also help in context of street environment.

Connect places and highlight routes for cyclists

The challenge in Wanneroo lies in understanding how the places connect, given the geography and nature of Wanneroo. This can be developed conceptually, at first and then confirmed using cycle saddle surveys.

Reduce reliance on the car/ public transport

Reducing reliance on a single mode of transportation not only encourages better use of networks but also gives people the opportunity to react to disruptions and re-plan the journey

In the City of Wanneroo there are a number of District, Secondary and Strategic Metropolitan Activity Centres which are key destinations for cyclists. Distances may be crucial to a cyclist using an unknown route. Distances should be provided at key intersections to help them assess journey feasibility and time.

The strategy being to assist and develop cycling in the community by providing an understanding of access and cycling through the delivery of well-considered information and signage systems. As an adopted strategic way finding strategy it is suggested that the following table provides an adopted approach to way finding and signing which is highlighted in SPP 4.2. This gives a coordinated programme of destinations and a network of developed places for local communities.

Main primary	Other Primary	Local	Supplementary
Strategic Metropolitan Centres Yanchep	**Secondary Centres** Alkimos Two Rocks North Wanneroo Clarkson (Ocean Keys)	**District Centres** Alexander Heights Butler (Brighton) Girrawheen (Newpark) Madeley (Kingsway City)	Parks Shopping centres Sports centre Train and Bus Stations Tourist attractions

		Neerabup (Banksia Grove) Eglinton	Named cycle routes e.g. “Boulevard 1” Trails Routes

Figure 6 City of Eugene Wayfinding sign **Figure 7 City of Columbus, Ohio**

From the Department of Transport WA “Your Move” agenda, the typical cost of way finding signs can be a Pole based signage: $800 per sign (50cm x 50cm) and for Ground based signage: $75 per sign installed (50cm x 50cm)

In addition to the signage and as part of the development of this bike plan, the Department of Transport have provided a table of line marked sealed shoulders that could be considered for being marked as cycle lanes.

7.5 5 Year Infrastructure Projects

7.5.1 Northern Wanneroo

Primary Network

Project	Location	Description	Expected Year
Connolly Drive	Lukin Drive to Hester Avenue	Construction of Cycle Track	2015 to 2020
Connolly Drive	Hester Avenue to Neerabup Road	Hybrid Facility - Separated Path, Bicycle Boulevard	2015 to 2020
Connolly Drive	Lukin to PSP	Design and Documentation Hybrid Facility west side- Separated Path, Bicycle Boulevard (1800m)	2015 to 2020
Marmion Avenue	COJ boundary to Neerabup Road	Design and Documentation one way protected cycle lanes (2100m)	2015 to 2020

Project	Location	Description	Expected Year
Neerabup Road	Marmion Avenue to PSP	Construction of a hybrid facility utilising parallel streets and separated Path (1450m)	2015 to 2020
Hester Avenue	Marmion Avenue to PSP	Construction of cycling facility (to be determined) (2000m)	2015 to 2020
Lukin Drive	Marmion Avenue to PSP	Construction of one way protected cycle lanes (1800m)	2015 to 2020
Jindalee to Yanchep Coastal Path	Jindalee to Yanchep	Construction of 4m Recreational Shared Path from Jindalee to Yanchep	2015 to 2020
Marmion Avenue	Marmion Avenue, Neerabup Road and Anchorage Drive Roundabout	Implementation of measures to improve safety at roundabout	2015 to 2020
Marmion Avenue	Marmion Avenue, Hester Avenue and Neerabup Drive Roundabout	Implementation of measures to improve safety at roundabout	2015 to 2020
Grade Separation	Marmion/ Hester Roundabout	Construction of a grade separated crossing running north/ south (across Hester Avenue)	2015 to 2020
Grade Separation	Connolly Drive/ Hester Avenue Roundabout	Design and Documentation for the construction of a grade separated crossing running east/west (across Connolly Drive)	2015 to 2020
Anchorage Drive	Marmion Avenue to Seaham Way	Construction of cycling facility (to be determined)	2015 to 2020
Yanchep Beach Road	Two Rocks Road to Wanneroo Road	Construction of cycling facility (to be determined)	2015 to 2020

Secondary Network

Project	Location	Description	Expected Year
Butler Train Station to Jindalee	Butler Station to Jindalee Beach	Construction of integrated cycling facility from Butler Train Station to Jindalee Beach(Route to be determined)	2015 to 2020
Quinns Rocks to Connolly Drive	Quinns Road, Palermo Court, Addison Park and Jenolan Way	Construction of a hybrid facility including bicycle boulevard for road sections and red asphalt pathway for off road sections	2015 to 2020
Lukin Drive to Quinns Rocks Coast	Quintal Court, Buffett Ramble, Navy Court, McCoy Place, James Cook Avenue, lorient Pass and Dartmouth Circle	Construct Bicycle Boulevard or Greenway	2015 to 2020
Jindalee to Connolly Drive	Jindalee Boulevard and Kingsbridge Boulevard	Construction of integrated cycling facility from Butler Train Station to Jindalee Beach (2200m)	2015 to 2020

Project	Location	Description	Expected Year
Tapping Way	From Camira Way to Quinns Road	Design and Documentation for the implementation of an integrated cycling facility such as Bicycle Boulevard or Greenway (1850m)	2015 to 2020
Old Yanchep cycling facilities	Brazier Road, Lagoon Drive, Beachside Prom, Lindsay Beach Boulevard	Construct Bicycle Boulevard or Greenway	2015 to 2020
Quinns Rocks Central to Mitchell Freeway PSP	Route to be determined	Construct Bicycle Boulevard or Greenway	2015 to 2020
Clarkson to Mindarie North Link	Renshaw Boulevard to Lighthouse Park	Construction of hybrid facility utilising underpass at Marmion Avenue, parkland, Grand Bank Parkway, Nalder Way with road section to be bicycle boulevard and park sections to be pathway	2015 to 2020
Clarkson Central Link	Renshaw Boulevard, Anthony Waring Park, Waring Green and Melbourne Loop	Construction of Hybrid Facility with road sections to be bicycle boulevards or greenways and park section to be paths.	2015 to 2020
PSP to Mindarie Marina	Rosslare Prom, Fairport Vista, Rochester Drive, McPherson Avenue, Waring Green, Anthony Waring Park, Victorsen Parade, Somerly Drive, and Hacienda Drive	Construction of Bicycle Boulevard/ Greenway (3500m)	2015 to 2020
Hester Avenue to Neerabup Road	Porongurup Drive, Hannaford Drive and Celebration Boulevard	Construction of Bicycle Boulevard/ Greenway (3000m)	2015 to 2020
Walyunga Boulevard, pitchford glade, Tindal Way and Carberry Square	Hannaford to Anthony Waring Park	Construction of Bicycle Boulevard/ Greenway (900m)	2015 to 2020
Belleville Gardens and Polglase Fairway	Marmion Avenue to Connolly Drive	Construction of Bicycle Boulevard/ Greenway (1250m)	2015 to 2020

7.5.2 Central Wanneroo

Primary Network

Project	Location	Description	Expected Year
Yellagonga Cycle Bridge	Yellagonga Regional Park	Construction of Stage 1 Yellagonga Cycle Bridge from Rotary Park to ECU - 4m wide facility.	2015 to 2020
Pinjar Road	Wanneroo Road to Joondalup Drive	Construction of hybrid facility utilising parallel roads on both sides of Pinjar Road as part of dualling process (4100m)	2015 to 2020
Pinjar Road	Flynn Drive to Joondalup Drive	Construction of one way protected cycle lanes as a part of dualling process (2600m)	2015 to 2020
Joondalup Drive	Wanneroo Road to Pinjar Road	Design and Documentation for the construction of a hybrid cycling facility on the south side of Joondalup Drive using parallel roads and connecting cycle paths(1140m bicycle boulevard and 1160m of bike path)	2015 to 2020
Yellagonga Cycling Links	Yellagonga Regional Park	Construction of missing links around lake Joondalup (1000m)	2015 to 2020

Secondary Network

Project	Location	Description	Expected Year
Dundebar Road	Wanneroo Road to Civic Drive	Construct Bicycle Boulevard or Greenway (500m)	2015 to 2020
Golf Links Drive	Wanneroo Road To Pinjar Road	Construct Bicycle Boulevard or Greenway	2015 to 2020
Cheriton Drive	Golf Links Drive to Joondalup Drive	Construct Bicycle Boulevard or Greenway	2015 to 2020
Greenvale Place and Mornington Drive	Joondalup Drive to Pinjar Road	Construct Bicycle Boulevard or Greenway	2015 to 2020
Gradis Boulevard	Old Yanchep Road to Pinjar Road	Construct Bicycle Boulevard or Greenway	2015 to 2020
Ghost Gum Boulevard and Honey possum Park	Joondalup Drive/ Pinjar Road to Pollen Turn (potential extension to Flynn Drive	Design and Documentation for the implementation of an integrated cycling facility such as Bicycle Boulevard or Greenway(2100m)	2015 to 2020

7.5.3 Southern Wanneroo

Primary Network

Project	Location	Description	Expected Year
Hepburn Avenue	Alexander Drive to Greenwood Train Station	5350m x 3.5m bi directional Cycle track with 0.5m separation strip from Alexander Drive to Wanneroo Road	2015 to 2020
Gnangara Road	Hartman Drive to Mirrabooka Avenue	Construction of separated facility as part of dualling process (2200m)	2015 to 2020
Gnangara Road	Hartman to Yellagonga Pathway	Construction of Hybrid Facility as part of dualling process utilising parallel road to the south of Hartman Drive, Gnangara Road/ Wanneroo Road Signals and PAW west of signals (1850m)	2015 to 2020
Ocean Reef Road	Wanneroo Road to COJ boundary	Construction of Shared path south side Ocean Reef Road to Trappers Drive	2015 to 2020
Kingsway	Alexander Drive to Wanneroo Road	Construction of hybrid cycling facility utilising CAP roads and 3m wide pathway connections at grade with road	2015 to 2020
Mirrabooka Avenue	Ocean Reef Road to Hepburn Avenue	Construction of one way protected cycle lanes (2600m) as part of the construction of Mirrabooka Avenue Dual Carriageway Project	2015 to 2020
Central Wangara North South Link	Ocean Reef Road to Gnangara Road	construction of a hybrid facility with bicycle boulevard on innovation circuit transitioning into one way protected cycle lane from Motivation Drive to Ocean Reef Road	2015 to 2020
Hartman Drive	Gnangara Road to Hepburn Avenue	Design and Documentation of Hybrid Cycling facility including bicycle boulevard on Bethwyn Court and Gelenesk Street and 2.5m bicycle only path with 1.8m pedestrian path from Russell Road to Hepburn Avenue	2015 to 2020

Infrastructure Implementation Plan
10 Year Implementation Plan

8. 10 Year Implementation Plan

8.1 Strategic Improvements

Strategic Item	Description	Expected Year
Station Links	Work with Joondalup and Stirling to complete all links within 5km of train stations	2020 to 2025
Safe Routes to School	Develop a 30km/h cycling environment on strategic cycling roads within 500m of all schools	2020 to 2025
Cross Sections of City Roads	Review the standard cross sections of the City's roads to include cycling facilities	2020 to 2025
Ongoing Maintenance	Develop and implement an ongoing maintenance program from all cycling routes within the City	Ongoing
Cycle design Standards for developers and designers	A universal set of standards for developers to apply in Wanneroo	2020 to 2025

8.2 Data Collection

Strategy	Description	Expected Year
Continued Monitoring and Data Collection	Advocate for the collection and provision of adequate cyclist crash data for local governments	Ongoing
	Develop and implement a cyclist counting program to track changes in mode share including fixed counters, portable counters, community surveys and user data sources such as Strava	Ongoing

8.3 Investigations / Feasibility Studies

Strategy	Description	Expected Year
Station Links	Conduct a review of all cycling routes within 5 km of train stations and develop action plan to address any missing infrastructure	2020 to 2025
Lake Joondalup Cycling Bridge	Construct 800m x 4m cycle bridge (Stage 1) to link Joondalup Secondary Centre to Wanneroo District Centre. An environmental and feasibility study will need to be conducted for the installation of this project	2020 to 2025

8.4 Behaviour Change Improvements

Strategy	Description	Expected Year
Cycle Training Schools Education	Implement cycle training in all primary schools within the City of Wanneroo	2020 to 2025
Way Finding	Develop and implement a cyclist wayfinding program that includes route markers and safety advice	2020 to 2025
Bike Maintenance	Investigate the need to run cycling maintenance courses within the City of Wanneroo	2020 to 2025

8.5 Infrastructure Projects

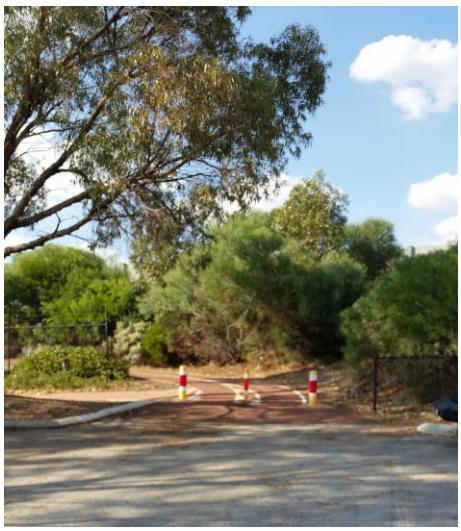
8.5.1 Station Design and Development

This section of the report describes the current cycling infrastructure and accessibility at train stations in Wanneroo; and presents a strategy for improving bicycle accessibility at train stations in reference to recommended practice and guidelines. Station design is the role of PTA; the City's role is limited to providing local connections to stations and advocating to the PTA for better bike facilities at stations.

8.5.1.1 Existing Train Station Access

Currently, train stations are provided at Clarkson and Butler. These stations are located along the Perth – Joondalup railway line and accommodate services running at 10 minute intervals during peak hours and 10 to 15 minute intervals throughout the rest of the day.

The following sections provide an overview of existing bicycle facilities and access at the stations.



Butler Station

This station opened in 2011 as a Transit Orientated Development the key components of which are:

- A park 'n' ride station with approximately 930 car bays
- 11 new buses providing feeder services into Butler and Clarkson stations
- Opportunity to positively influence land use around the station as a Transit Oriented Development

- Three road-over-rail bridges at Landbeach Boulevard, Benenden Avenue and the future Butler Boulevard

Importantly the station has dedicated cycle facilities and these should be promoted, with local links to improve connectivity and promote cycle use to the station. Bikes can go on trains during off peak times, weekends and public holidays. During weekday peak times you can take your bike on trains going away from Perth City (7:00 - 9:00am) or towards the City (4:30 - 6:30pm). Bikes are not permitted on trains stopping at or passing through Perth Train Station at these times.

Clarkson Station

From a cycling perspective, Clarkson station is one of the most important in Wanneroo as this provides good connectivity to a large residential commuter area. There are cycle parking facilities but limited dedicated off road cycle lanes to promote cycling locally. Clarkson Railway Station is located at Ocean Keys Boulevard, Clarkson and via Ocean Keys Boulevard this could provide a key link to Mindarie and the area for cyclists.

The following stations within the City of Joondalup are also accessed by residents of Wanneroo.

Currambine Station

Currambine Station is located near the end of the Mitchell Freeway, providing over 1000 car parking bays. There are also bike lockers and a bike shelter as shown in the following image. This station does not have any interchange facilities.

Joondalup Station

Joondalup train station is a major interchange station as it is serviced by 19 bus routes. The car parking for this station is at Lakeside Joondalup. This train station is accessed by Collier Pass.

Edgewater Station

Edgewater train station is located in the median strip of the Mitchell Freeway, adjacent to Joondalup Gate shopping centre. The station is not an interchange station.

By road, the station is accessed directly from Joondalup Drive. Currently 836 car parking bays are provided at the station, with an additional car park to be completed in 2016 increasing the total parking capacity to approximately 1360 bays. This planned increase in car parking bays highlights the current heavy demand for park-and-ride at the station.

In terms of cycling infrastructure, there are bike lockers and a bike shelter.

8.5.2 Wanneroo Strategic Cycle Sporting Facility

There is a significant need for a cycle training, sporting venue in north metropolitan Perth where there are a great number of sporting cyclists and Wanneroo has a member base extending from Joondalup to Two Rocks. Such a facility could provide for:

- A closed criterium circuit (800m – 2km)
- Adjacent to or including a time trial/ road circuit (4-10km)
- Club rooms/ functional area and bicycle storage
- Used for training and racing, schools, talent search and education purposes
- Could incorporate an outdoor velodrome, or provide complimentary uses
- Would create a sense of place for cycling. A centre for cycling history

In Wanneroo this would be centrally located for a high regional catchment, provide currently un-available access to cycling as a sport; competition and training, promote talent and regional development, cater for school education and training, raise the profile of cycling as a competitive sport in the area and potentially host state or national level competitions and generate associated economic benefits with spectators and interstate visitors

8.5.3 Provide Bicycle Parking and End of Trip Facilities

Secure cycle parking should be incorporated in new developments that have the potential to attract cyclists. This can be ensured by making it a planning requirement that one cycle space be provided for a specified number of employees, bedrooms, area of retail floor space or number of seats in cinemas/halls, or percentage of visitors. These standards should be investigate for the appropriate standards applicable in Wanneroo.

This Cycle Parking standards are provided below and should be incorporated into the ***Strategic Community Plan*** as a policy and as an entry in the standards chapter.

There are benefits to be gained by providing end-of-trip facilities for cyclists. Given the importance of end-of-trip facilities for commuter cyclists, there is a particular emphasis on workplace end-of-trip facilities. Provision of end-of-trip facilities (e.g. secure parking) at transport hubs, schools and businesses.

Benefits of providing end-of-trip facilities

Cycling can help a workplace or other organisation to be more productive and healthy, while demonstrating support for the environment. The benefits for employers, schools, universities and other organisations who provide best-practice end-of-trip facilities include:

- A healthier, happier workforce or student body;
- Higher productivity and better attitudes towards work;
- Reduced car parking demands and associated costs;
- Reduced driving and improved safety around schools and in centres; and
- An improved environmental and healthy image for the organisation.

End-of-trip facility design should consider the following issues:

- Location – it is preferable to place bicycle parking facilities in locations that allow a bicycle to be ridden to within 30 metres of the end-of-trip facility and also allow convenient access to showers and other end-of-trip facilities. Design of locations should also provide convenient and safe access from surrounding bicycle routes and main entry points.
- Route design – it is important to ensure access routes are designed to meet the needs of cyclists including:

- Sufficient overhead clearance for mounted bicycle riders (who are taller than pedestrians and most motor vehicles) avoiding steep ramps, speed humps, channelling, drainage grates or other hazards that are not suitable for traversing by bicycle riders
- Appropriate levels of surveillance and lighting
- Avoidance of causing any hazard to pedestrians

Cyclists Facility	Safe Access	Staff Parking	Visitor Parking	Toilets	Showers	Lockers	Courtesy Equipment	Repair and servicing equipment
Workplaces	✓	✓	✓	✓	✓	✓	✓	✓
Schools	✓	✓				✓		
Colleges	✓	✓	✓	✓	✓	✓	✓	✓
Shopping Centres, business centres, customer service Centres etc.	✓		✓	✓				✓
Courtesy equipment may include; mirror, hairdryers, iron, dryer, towels, clothing, washing machine etc. Repair equipment may include; foot pump, puncture equipment, light recharging								

Example End of Trip Facility – The Quadrant William Street

Interim Cycle Parking Standards - Location and Land Use (To be revised by 2018)

Use	Cycle Parking Standards
Multiple Dwelling , Lodging House, Residential Building	1 space per 12 dwellings/lodging rooms
Short Stay Accommodation	1 space per 40 guest bedrooms
Commercial [b]:- - Local Shops (less than 1,000m² NLA) - Neighbourhood Centres (between 1,001m² - 5,000m² NLA) - District Centres (greater than 5,001m² NLA)	 1 space per 150m² NLA (minimum 2 spaces) 1 space per 300m² NLA (minimum 6 spaces) 1 space per 750m² NLA (minimum 16 spaces)
Office	1 space per 500m² NLA
Consulting Rooms, Medical Centre	1 space per 4 practitioners
Hotel (excluding accommodation component)	1 space per 150m² of bars and public areas, including lounges, beer gardens and restaurants
Health Studio Private Recreation	1 space per 200m² NLA available to the public, including swimming pools
Community Use Exhibition Centre Public Worship -	1 space for every 30 people the building is designed to accommodate
Showroom	1 space per 1,000m² NLA
Industry - Service	1 space per 800m² NLA for premises greater than 300m² NLA
Other Industrial Uses	1 space per 1,000m² for premises greater than 300m² NLA

8.5.4 Northern Wanneroo

Primary Network

Project	Location	Description	Expected Year
Connolly Drive	Lukin Drive to PSP	Hybrid Facility - Separated Path, Bicycle Boulevard	2020 to 2025
Marmion Avenue	COJ boundary to Neerabup Road	Construction of one way protected cycle lanes	2020 to 2025
Marmion Avenue	Neerabup Road to Lukin Drive	Design and Documentation of cycling facility (to be Determined) (4250m)	2020 to 2025
Marmion Avenue	Nerrabup Drive to Lukin Drive	Construction of cycling facility (to be determined)(4250m)	2020 to 2025
Marmion Avenue	Lukin Drive to Yanchep	Design and Documentation of cycling facility (to be determined) (14650m)	2020 to 2025
Marmion Avenue	Lukin Drive to Yanchep	Construction of cycling facility (to be determined) (14650m)	2020 to 2025

Secondary Network

Project	Location	Description	Expected Year
Tapping Way	from Camira Way to Quinns Road	Construct Bicycle Boulevard or Greenway	2020 to 2025

8.5.5 Central Wanneroo

Primary Network

Project	Location	Description	Expected Year
Joondalup Drive	Wanneroo Road to Pinjar Road	Construction of a hybrid cycling facility on the south side of Joondalup Drive using parallel roads and connecting cycle paths(1140m bicycle boulevard and 1160m of bike path)	2020 to 2025
Joondalup Drive	Pinjar Road to Old Yanchep Road	Construction of a hybrid cycling facility on the south side of Joondalup Drive using parallel roads and connecting cycle paths(830m bicycle boulevard and 1240m of bike path)	2020 to 2025
Joondalup Drive	Wanneroo Road to Old Yanchep Road	Construction of one way protected cycle lane of north side of Joondalup Drive	2020 to 2025
Lenore Road	Ocean Reef Road to Elliott Road	Construction of hybrid facility utilising parallel roads to the west of Lenore Road (1450m of bicycle boulevard and 1300m of bike path) to be completed as part of dualling process	2020 to 2025
Franklin Road	Caporn Road to Elliott Road	Construction of a cycling facility (to be determined)	2020 to 2025

Project	Location	Description	Expected Year
Flynn Drive	Wanneroo Road to Old Yanchep Road	Construction of a cycling facility (to be determined) as part of the dualling of Flynn Drive	2020 to 2025
Yellagonga Cycling Links	Yellagonga Regional Park	Design and Documentation for the widening existing shared path to 4m around lake Joondalup	2020 to 2025
Caporn Street	Franklin Road to Pinjar Road	Construction of a cycling facility (to be determined)	2020 to 2025
Elliot Road/San Rosa Road	Lake Joondalup to Lenore Road	Construction of a hybrid facility utilising cap roads and cycle paths (1650m)	2020 to 2025

Secondary Network

Project	Location	Description	Expected Year
Ghost Gum Boulevard and Honey possum Park	Joondalup Drive/ Pinjar Road to Pollen Turn (potential extension to Flynn Drive	Construct Bicycle Boulevard or Greenway	2020 to 2025
Clarkson Avenue/ Yandella Prom	Wanneroo Road to Pinjar Road	Construct hybrid facility utilising Cap Roads and Bicycle Boulevard or Greenway (2100m)	2020 to 2025
Waldburg Drive, Titan Way, Berlotto Drive and Carosa Road	Joondalup Drive to Ashby East West Link	Construct Bicycle Boulevard or Greenway	2020 to 2025
Turnwood Vista, Reenner Circle, Monet Drive, Carosa Road and Hollesy Way	lake Joondalup Shared Path to Pinjar Road	Construct Bicycle Boulevard or Greenway	2020 to 2025
Ariti Avenue/ Jindanga Way	Lake Joondalup to Wanneroo Town Centre	Construction of a hybrid facility	2020 to 2025
Wyatt Road, Brooklyn Avenue, Classic Rise and Port Link	Elliot Road to Ocean Reef Road	Construct Bicycle Boulevard or Greenway	2020 to 2025
East Road, James Spiers Road nad Scenic Drive	Lake Joondalup to Lenore Road	Construction of a hybrid facility	2020 to 2025

8.5.6 Southern Wanneroo

Project	Location	Description	Expected Year
Beach Road	Alexander Drive to Wanneroo Road	In collaboration with the City of Stirling install a segregated Cycling facility (5350m)	2020 to 2025
Marangaroo Drive	Alexander Drive to Wanneroo Road	Construction of a separated one way cycle lanes as per design (TBC) from Alexander Drive to Wanneroo Road including green head start boxes at Templeton Crescent, Highclere Boulevard, Mirrabooka Avenue, The Avenue and Alexander Drive (5400m)	2020 to 2025

Project	Location	Description	Expected Year
Ocean Reef Road	Alexander Drive to Wanneroo Road	Construction of one way cycle lanes including green headstart boxes at Alexander Drive, Hartman Drive, Niche Parade and Gnangara Road (6500m)	2020 to 2025
Ocean Reef Road	Wanneroo Road to COJ boundary	Construction of single direction cycle lane north side Ocean Reef Road from Mitchell Freeway to Wanneroo Road (with COJ)(3000m, 1750m City of Wanneroo, 1250m City of Joondalup) including green head start boxes at Joondalup Drive, Trappers Drive and Ocean Reef Road	2020 to 2025
Alexander Drive	Gnangara Road to Hepburn Avenue	Construct protected one way protected cycle lanes (2800m)	2020 to 2025
Alexander Drive	Hepburn Avenue to Beach Road	Construct protected one way protected cycle lanes (3300m) including green head start boxes at Hepburn Avenue, Illawara Crescent, Marangaroo Drive, Illawara Crescent (south), Beach Road	2020 to 2025
Mirrabooka Avenue	Hepburn Avenue to Beach Road	Construction of one way protected cycle lanes (3200m) including green head start boxes at Beach Road, Marangaroo Drive and Gnangara Road	2020 to 2025
Lake Goollegal	Hepburn Avenue to Whitfords Avenue	Upgrade existing facility from 2.5m to 4m wide	2020 to 2025
Central Wangara North South Link	Ocean Reef Road to Gnangara Road	Construction of a bicycle boulevard on Achievement Way, Challenge Boulevard and excellence drive	2020 to 2025
Hartman Drive	Gnangara Road to Hepburn Avenue	Construction of Hybrid Cycling facility including bicycle boulevard on Bethwyn Court and Gelenesk Street and 2.5m bicycle only path with 1.8m pedestrian path from Russell Road to Hepburn Avenue	2020 to 2025
Hartman Drive	Gnangara Road to Hepburn Avenue	Construction of one way protected cycle lane east side of Hartman drive from Gnangara Road to Hepburn Avenue as part of Hartman Drive Dual lane project	2020 to 2025
Central Marangaroo Cycle link	Chancellor's Rise, Le Grand Gardens and Highclere Boulevard	Construction of a bicycle boulevard on Chancellor's Rise, Le Grand Gardens and Highclere Boulevard (1550m)	2020 to 2025
Girrawheen Avenue	Beach Road to Marangaroo Drive	Construction of a separated cycle facility (to be determined) from Beach Road to Marangaroo Drive (1600m)	2020 to 2025
Hartman Drive Grade Separation	Wicklow Park	Construction of grade separation/ cyclist priority	2020 to 2025
Mirrabooka Avenue	Kingsway Cycle Way	Construction of grade separation/ cyclist priority	2020 to 2025

Secondary Network

Project	Location	Description	Expected Year
Landsdale Road	Alexander Drive to Hartman Drive	Construct Bicycle Boulevard or Greenway	2020 to 2025

Infrastructure Implementation Plan
15 Year Implementation Plan

9. 15 Year Implementation Plan

9.1 Strategic Improvements

Strategic Item	Description	Expected Year
Trails Master Plan Implementation	Review and develop a new Trails Master Plan for the City of Wanneroo.	2025 onwards
Shared Zones	Implement 30km/h shared zones in all strategic centres including	2025 onwards
Ongoing Maintenance	Develop and implement an ongoing maintenance program from all cycling routes within the City	Ongoing
Hester Avenue Bridge Across Train Line	Investigate the retention of the existing Hester Avenue bridge for Cycling	2025 onwards
Travel Plans	Travel Planning across business and workplaces	2025 onwards

9.2 Data Collection

Strategy	Description	Expected Year
Monitoring and Data Collection	Advocate for the collection and provision of adequate cyclist crash data for local governments	2025 onwards
	Develop and implement a cyclist counting program to track changes in mode share including fixed counters, portable counters, community surveys and user data sources such as Strava	2025 onwards

9.3 Investigations / Feasibility Studies

Strategy	Location	Description	Expected Year
Cycle Hire Scheme	Various	Investigate the feasibility of developing a bicycle hire scheme within the City of Wanneroo and Joondalup	2025 onwards

9.4 Behaviour Change Improvements

Strategy	Description	Expected Year
Cycle Training Schools Education	Improve cycling participation in schools by offering cycle training for those schools that participate in Travelsmart to Schools Program or similar travel behaviour change programs.	2025 onwards
Way Finding	Develop and implement a cyclist wayfinding program that includes route markers and safety advice	2025 onwards

Strategy	Description	Expected Year
Bike Maintenance	Investigate the need to run cycling maintenance courses within the City of Wanneroo	2025 onwards

9.5 Infrastructure Projects

9.5.1 Provide Key Cycle Links to Major Activity Centres

A key element to this plan is providing links to key attractors, schools, shops and transport hubs. The action plan focuses on connectivity including the linking of future development areas with essential services at transport hubs such as rail stations.

The creation of a comprehensive network of safe, comfortable and continuous cycle routes, designed to provide access between and into a range of activity centres throughout the metropolitan area, is needed if cycling is to be increased other than marginally. This should comprise a principal bicycle network of off road paths to link major centres and a much larger and fine grained network (the secondary bicycle network) to provide safe continuous access to a much larger range of centres, schools and community facilities. The secondary network will comprise a range of safe bicycle facilities that will be determined based on traffic volumes, traffic speeds, available space and other design factors.

9.5.1.1 Missing Links to Yanchep Strategic Metropolitan Centre

A review of the existing cycle infrastructure and local facilities was undertaken with key consultations and community events. As part of this, a particular focus was given to networks between major trip attractors such as commercial areas, schools, retail and recreation/ community centres.

Figure 9.1: Yanchep City Centre - Draft Activity Centre Plan

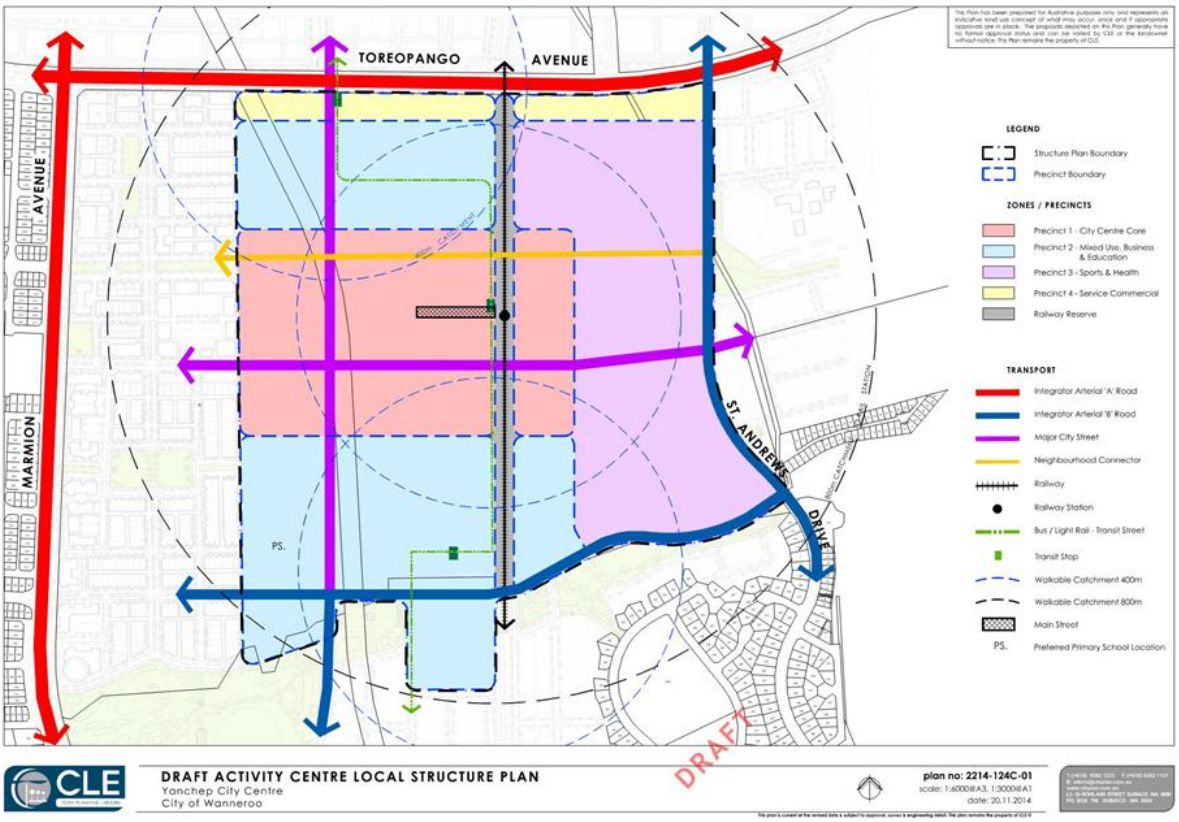


Figure 9.2: Yanchep City Centre - Potential Cycling Network

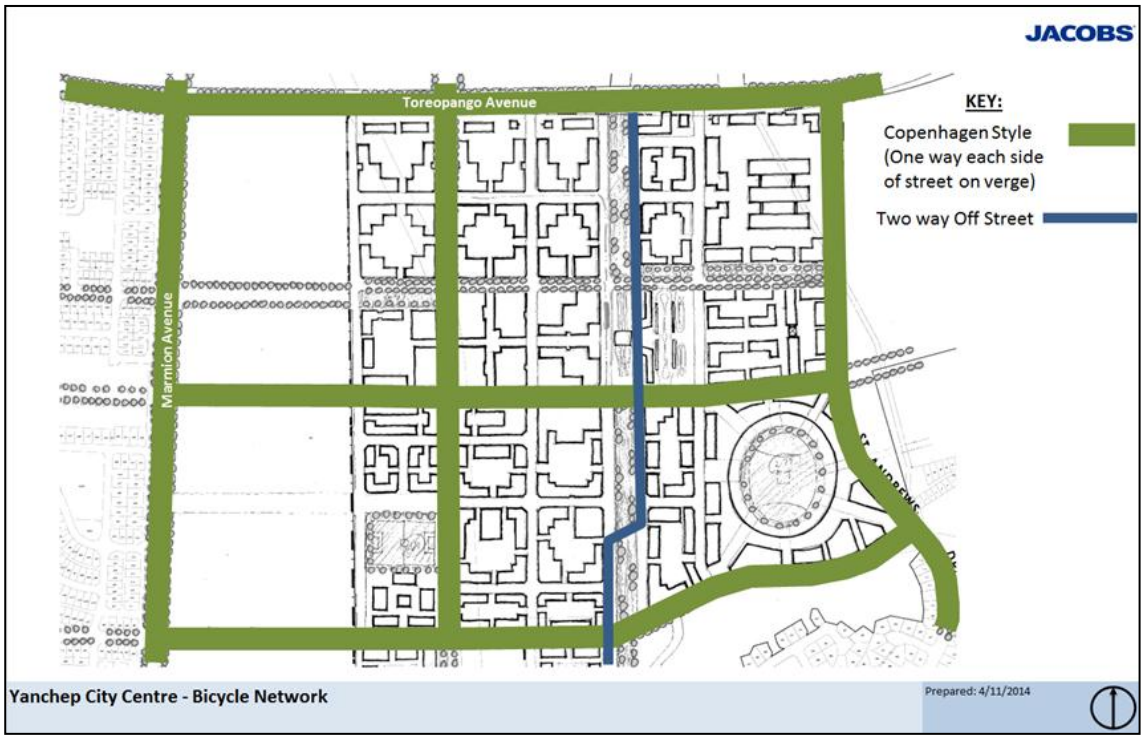
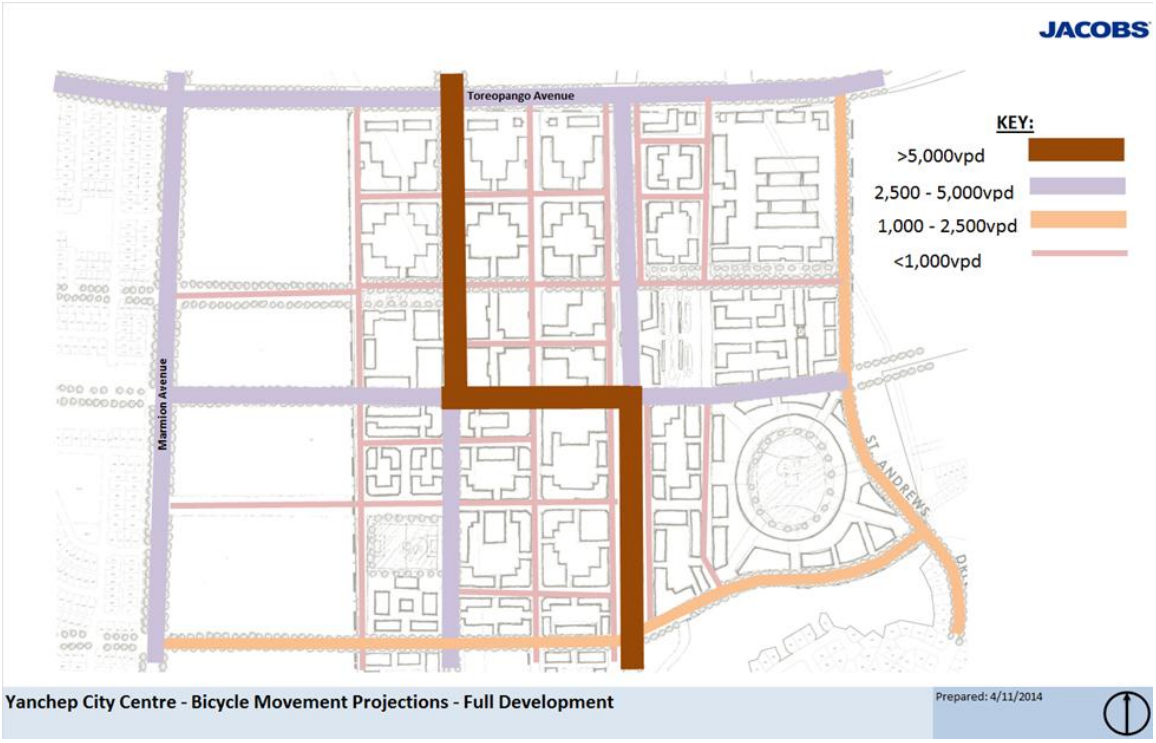


Figure 9.3: Yanchep City Centre - Bicycle Movement Projections



9.5.1.2 Links with Joondalup

The City of Joondalup's *Strategic Plan 2008-2011* articulates the highest level of direction for the City. It is an overarching framework that aims to achieve better leadership and decision making with greater community participation for the City. The following objectives of the City are applicable to this Bike Plan:

- To encourage the development of the Joondalup CBD
- To ensure the City's facilities and services are of a high quality and accessible to everyone
- To facilitate healthy lifestyles within the community

Connectivity with Joondalup is considered important for residents of Wanneroo, who have a number of destinations in Joondalup, i.e. ECU & train stations.

One of the most strategic proposals from the development of this plan is the potential link across the lake. Currently the lake requires cyclists to take a 17k route around to facilitate the east/west links between activity centres and the Wanneroo/Joondalup link. A cycle and footbridge would have significant benefits linking major attractors, activity centres, train stations and provide a connectivity supported by the community.

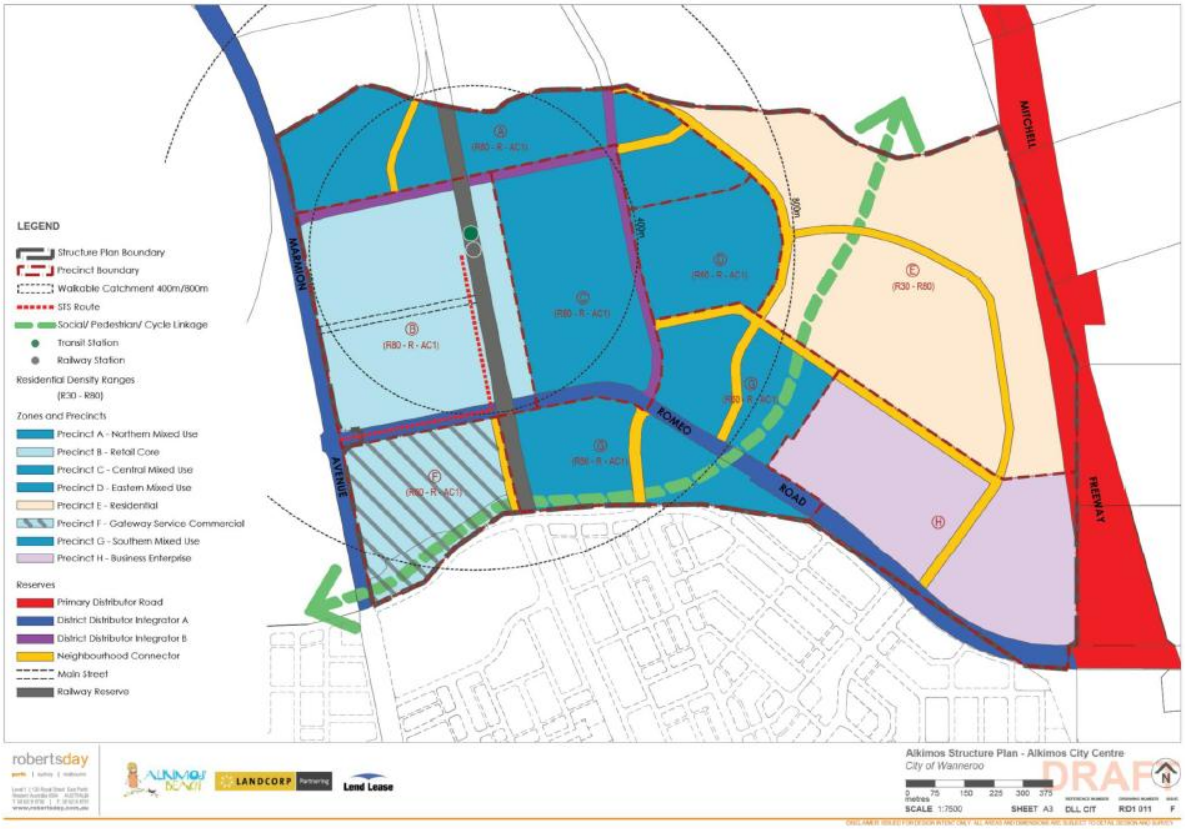
Figure 4 Example Bridge Charleston Cycle & Footbridge Minnesota

Key Joondalup links include:

- On-road bicycle lanes continue across the local government boundary along Joondalup Dr, Ocean Reef Rd and Marmion Ave.
- On-road bicycle lanes on Whitfords Ave finish at Wanneroo Rd; no off-road or on-road facilities exist between Whitfords Ave and Gnangara Rd (also a district distributor)
- Off-road path continues across the local government boundary along Hepburn Ave, and an off-road connection is made from Warwick Rd to Marangaroo Dr (also a district distributor)
- PBN local bicycle route NW4 crosses the Joondalup / Wanneroo boundary
- The coastal shared path in Joondalup finishes before the boundary

9.5.1.3 Links in Alkimos Structure Plan

Alkimos Structure Plan – Alkimos City Centre



At full development1 the Alkimos City Centre will:

- Be home to more than 5,000 residents;
- Provide more than 10,000 jobs;
- Be a vibrant retail and activity centre.

Based on the proposed activities within the city centre, we estimate there will be approximately 100,000 daily transport trips to / from the city centre. Because Alkimos City Centre is being designed as a transit oriented development (TOD), there will be fewer car trips and more trips made by public transport, walking and cycling.

The following estimate of travel to / from Alkimos City Centre by the different transport modes has been used to assist in the planning and concept design of city centre transport infrastructure:

- Car driver – 45,000 trips / day;
- Car passenger - 19,000 trips / day;
- Public transport – 10,000 trips / day;
- Walking – 20,000 trips / day;
- Cycling – 6,000 trips / day.

9.5.2 Trails network

The Trails Masterplan Stage 1 was carried out for Wanneroo in 2003 and was an important stepping stone in the development process in providing a framework to direct the planning and implementation of the trails in the City of Wanneroo. Trails are utilised by mountain bike riders which are usually not considered to be part of the

cycling agenda. The inclusion of trails in the development of this plan reflects the importance of developing facilities for all bicycle users.

This study identified that there are a number of existing trails, exploring the landscape, including the Lake Joondalup Heritage Trail, Yaberoo Badjara Trail, The Coastal Plain Trail and the 10th Light Horse Trail. With much of the City still to be developed there is the opportunity to incorporate new trails which were identified from the community consultation, site reconnaissance and general research.

Improving and completing the trails should be a key a target for the City and a full study should be carried out for this programme. Additional trials could include a foreshore coastal trail, a maritime trail through the extensive reef and shipwrecks located off the Wanneroo coastline; and the development of an endurance bridle trail connecting to the existing Coastal Plain Trail and further connections to Geraldton.

Resulting from this earlier report a number of recommendations were made, which have commenced in some degree but which have been further raised as part of this consultation. The key trails which have been identified and raised by the community include:

9.5.2.1 Marine Trail

The Marine Trail potentially has the least implementation constraints, and therefore should be considered first for implementation.

9.5.2.2 Yaberoo Budjara Trail / Old North Stock Route

The implementation of this trail has already started; it has involved community consultation as well as the preparation of several reports. The trail is poor in places and there are many comments and requests to upgrade the surface and facilities along this route.

9.5.2.3 Equestrian Trails including the Endurance Bridle Trail

The development of this series of trails will have to consider a number of factors, which may take a substantial length of time.

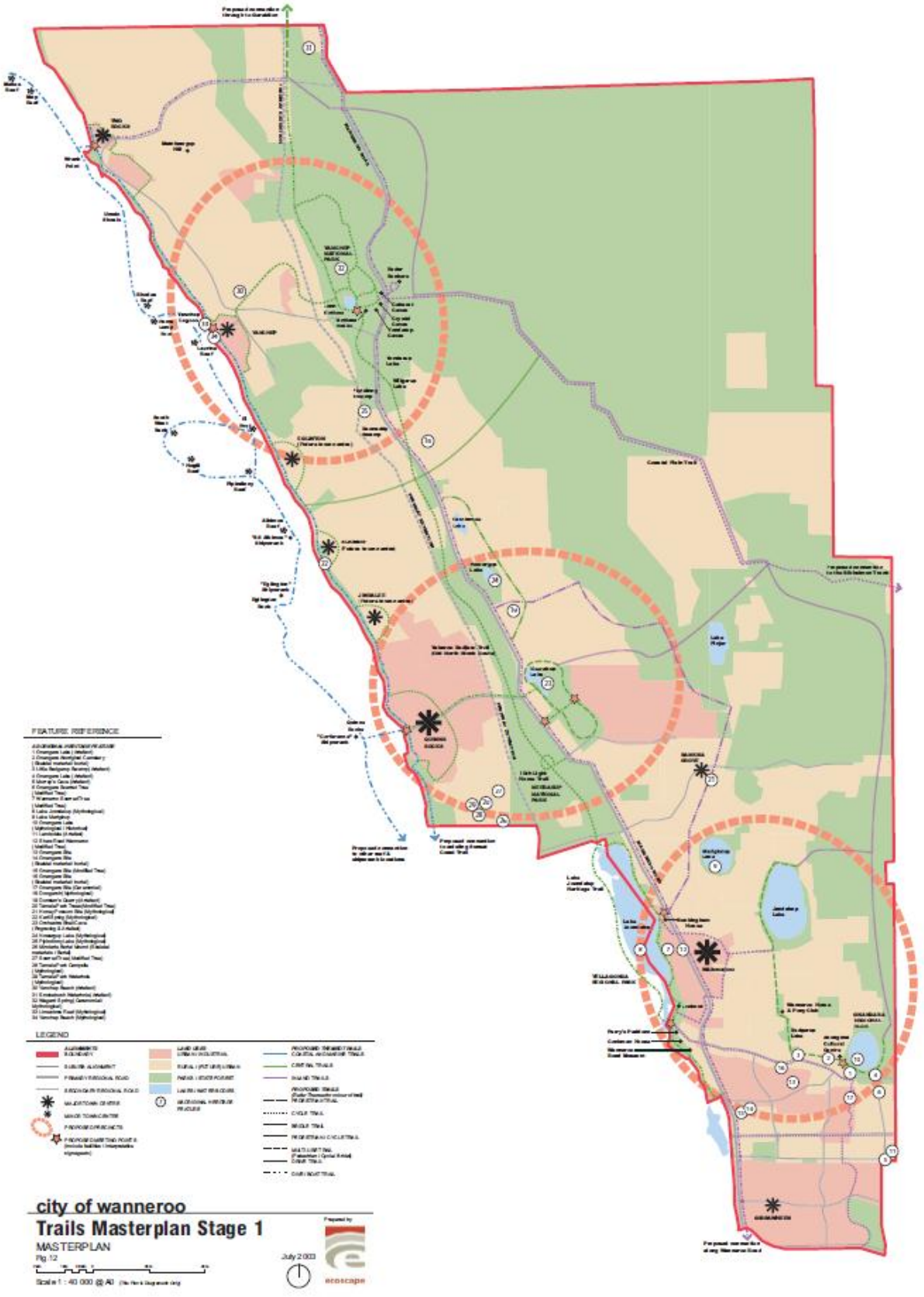
9.5.2.4 Coastal Trail

The Coastal Trail will be constructed as future town centres are developed.

9.5.2.5 East-West Trails

The East-West trails should be considered for implementation as the main trails they connect are constructed, the main trails would include the Coastal Trail, the Yaberoo Budjara / Old North Stock Route and the Endurance Bridle Trail.

To assist in the identification, justification and prioritisation of trails projects a review of the Trails master plan should be conducted and a new trails master plan developed if required.


FEATURE REFERENCE
LEGEND
city of wanneroo
Trails Masterplan Stage 1
MASTERPLAN
Fig.12
July 2003
ecoscape

9.5.3 Northern Wanneroo

Primary Network

Project	Location	Description	Expected Year
Connolly Drive	Lukin Drive to Neerabup Road	Feasibility Study, Design and Documentation of cycling facility on east side of Connolly Drive	2025 onwards
Connolly Drive	Neerabup Road to COJ Boundary	Construction of one way protected cycle lanes	2015 onwards
Grade Separation	Connolly Drive/ Hester Avenue Roundabout	Construction of a grade separated crossing running east/west (across Connolly Drive)	2025 onwards

9.5.4 Central Wanneroo

Primary Network

Project	Location	Description	Expected Year
Yellagonga Cycling Links	Yellagonga Regional Park	Widening of all existing shared paths to 4m around lake Joondalup	2025 onwards

9.5.5 Southern Wanneroo

Primary Network

Project	Location	Description	Expected Year
Lake Goollegal	Cycle Bridge connecting Kingsway cycling facility to Robinson Cycle Track	Construction of 4m wide Cycling and pedestrian Bridge connecting Kingsway cycling facility to Robinson Cycle Track	2025 onwards
Yellagonga Regional Park	Whitfords Avenue to Ocean Reef Road	Widen existing shared path to 4m from Whitfords Avenue to Ocean Reef Road	2025 onwards

Secondary Network

Project	Location	Description	Expected Year
Butterworth Avenue/ Koondoola Avenue	Beach Road to Mirrabooka Avenue and Marangaroo Drive	Design and Documentation for the implementation of an integrated cycling facility such as Bicycle Boulevard or Greenway (2500m)	2025 onwards
Butterworth Avenue/ Koondoola Avenue	Beach Road to Koondoola Ave	Construct Bicycle Boulevard or Greenway	2025 onwards
The Avenue	Marangaroo Drive to Hepburn Avenue	Construct Bicycle Boulevard or Greenway	2025 onwards

Project	Location	Description	Expected Year
Amberton Avenue/ Hainsworth Avenue	Beach Road to Marangaroo Drive	Design and Documentation for the implementation of an integrated cycling facility such as Bicycle Boulevard or Greenway (1500m)	2025 onwards
Amberton Avenue/ Hainsworth Avenue	Beach Road to Marangaroo Drive	Construct Bicycle Boulevard or Greenway	2025 onwards
Heathfield Drive, Queensway Road	Mirrabooka Avenue to Alexander Drive	Construction of a hybrid facility with bicycle boulevard/ greenway on Heathfield Drive and Queensway with 3m wide cycle path through Broadview Park	2025 onwards
Furness Road to Rawlinson Drive	Macdermott Parade, Ashdale Boulevard, Evandale Road, Redcliffe Avenue, Bloodwood Drive	Construct Bicycle Boulevard or Greenway	2025 onwards
Hartman Drive to Mirrabooka Avenue	Furness Road, Ashdale Boulevard, Wicklow Parh and Belviour Park	Construct Bicycle Boulevard or Greenway	2025 onwards
Prindiville Drive	Hartman Drive to Yellegonga pathway	Construct armidilo seperated one way cycle lanes (1800m)	2025 onwards
Gnangara Road to Hepburn Avenue	Klarborg Drive, Olivedale Drive, Amstel Park, Corbin Gate, Russell Road, Sovarno Drive and Bellerve Boulevard	Construction of a hybrid facility with bicycle boulevard/ greenway on Klaraborg, Olivedale, Corbin Gate, Russell Road, Sovarano and Bellerve with a 3m wide cycle path through Amstel Park	2025 onwards
Giralt Road	Hepburn Avenue to Marangaroo Drive	Construct Bicycle Boulevard or Greenway	2025 onwards
Rawlinson Drive	Mirrabooka Avenue to Central Marangaroo Cycle Link	Construct Bicycle Boulevard or Greenway	2025 onwards
Templeton Drive/ Blackmore Avenue/ Hudson Avenue	Wanneroo Road to Beach Road, Girrawheen Avenue and Marangaroo Drive	Construct Bicycle Boulevard or Greenway	2025 onwards
Alexander Drive to Marangaroo Cycle Link	Richenda Crescent, Berkley Road, Goldsworthy Entrance, Axford Road, Picton Terrace, Marangaroo Drive, Tyndall Crescent, Shaftsbury Avenue	Construction of a hybrid facility with bicycle boulevard/ greenway on road sections and 3m wide cycle path on off road sections	2025 onwards
Kingsway to Marangaroo Drive	Rangeview Road, Axford Road, Derbi Road and Marianne Way	Construction of a hybrid facility with bicycle boulevard/ greenway on road sections and 3m wide cycle path on off road sections	2025 onwards

Map Reference Number	Gap / Scheme		Estimated Costs	City of Wanneroo Estimated Contributions	Developer Contributions	DoT / PTA / Other Contributions
	5 Year Implementation Plan					
	Strategic Improvements					
	Integrated Transport Strategy		$30,000.00	$30,000.00	$0.00	$0.00
	Funding					
	Resourcing		$80,000.00	$80,000.00	$0.00	$0.00
	Advisory Group		$10,000.00	$10,000.00	$0.00	$0.00
	Cycling Items in Committee Agendas		Officer Time			
	Maintenance		Maintenece budgets			
	Median Treatments		Design Programme			
	End of Trip Facilities		$25,000.00	$0.00	$25,000.00	$0.00
	Establish a Skills and Education Programme		$10,000.00	$10,000.00	$0.00	$0.00
	Travel Plans		Business Specific			
	Recommendations for Structure Plans		$10,000.00	$10,000.00	$0.00	$0.00
		Strategic Improvements Total	$165,000.00	$140,000.00	$25,000.00	$0.00
	Data Collection					
	Monitoring and Data Collection		$20,000.00	$20,000.00	$0.00	$0.00
		Data Collection Total	$20,000.00	$20,000.00	$0.00	$0.00
	Investigations/Feasibility Studies					
	Trails Feasibility Study		$80,000.00	$80,000.00	$0.00	$0.00
	Lake Joondalup Cycling Paths		$250,000.00	$250,000.00	$0.00	$0.00
	Recreational Sporting Cycling Facility		$50,000.00	$25,000.00	$0.00	$25,000.00
	Bicycle Boulevard Clarkson Link		$80,000.00	$80,000.00		
	Marmion Avenue Study		$20,000.00	$20,000.00	$0.00	$0.00
		Invesitgation/Feasibility Studies Total	$480,000.00	$455,000.00	$0.00	$25,000.00
	Behaviour Change Improvements					
	Cycle Training Schools Education		$10,000.00	$5,000.00	$5,000.00	$0.00
	Way Finding		$25,000.00	$15,000.00	$0.00	$10,000.00
	Bike Mainenance		$10,000.00	$5,000.00	$0.00	$5,000.00
		Behaviour Change Improvements Total	$45,000.00	$25,000.00	$5,000.00	$15,000.00
	Infrastructure Projects					
	North					
	Primary Network					
	Connolly Drive (Lukin Drive to Hester Avenue)		$320,000.00	$320,000.00	$0.00	$0.00
	Connolly Drive (Hester Avenue to Neerabup Road)		$230,000.00	$230,000.00	$0.00	$0.00
	Connolly Drive (Lukin Drive to PSP)		$190,000.00	$190,000.00	$0.00	$0.00
	Marmion Avenue (CoJ Boundary to Neerabup Road)		$230,000.00	$230,000.00	$0.00	$0.00
	Neerabup Road (Marmion Avenue to PSP)		$155,000.00	$155,000.00	$0.00	$0.00
	Hester Avenue (Marmion Avenue to PSP)		$220,000.00	$220,000.00	$0.00	$0.00
	Lukin Drive (Marmion Avenue to PSP)		$190,000.00	$190,000.00	$0.00	$0.00
	Jindalee to Yanchep Coastal Path (Jindalee to Yanchep)		$4,100,000.00	$1,100,000.00	$1,500,000.00	$1,500,000.00
	Marmion Avenue (Marmion Avenue, Neerabup Road and Anchorage Drive Roundabout)		$105,000.00	$105,000.00	$0.00	$0.00
	Grade Separation (Marmion/Hester Roundabout)		$1,525,000.00	$1,525,000.00	$0.00	$0.00
	Grade Separation (Connolly Drive/Hester Avenue Roundabout)		$25,000.00	$25,000.00	$0.00	$0.00
	Anchorage Drive (Marmion Avenue to Seaham Way)		$210,000.00	$210,000.00	$0.00	$0.00
	Yanchep Beach Road (Two Rocks Road to Wanneroo Road)		$110,000.00	$110,000.00	$0.00	$0.00
	Secondary Network					
	Butler Train Station to Jindalee (Butler Train Station to Jindalee Beach)		$210,000.00	$210,000.00	$0.00	$0.00
	Quinns Rocks to Connolly Drive (Quinns Road, Palermo Court, Addison Park and Jenolan Way)		$1,010,000.00	$1,010,000.00	$0.00	$0.00
	Lukin Drive (Quintal Court, Buffett Ramble, Navy Court, McCoy Place, James Cook Avenue, Orient Pass and Dartmouth Circle)		$175,000.00	$175,000.00	$0.00	$0.00
	Jindalee to Connolly Drive (Jindalee Boulevard and Knightsbridge Boulevard)		$230,000.00	$230,000.00	$0.00	$0.00
	Tapping Way (from Camira Way to Quinns Road)		$195,000.00	$195,000.00	$0.00	$0.00
	Old Yanchep Cycling Facilities (Brazier Road, Lagoon Drive, Beachside Prom, Lindsay Beach Boulevard)		$465,000.00	$465,000.00	$0.00	$0.00
	Quinns Rocks Central to Mitchell Freeway PSP		$380,000.00	$380,000.00	$0.00	$0.00
	Clarkson to Mindarie North Link (Renshaw Boulevard to Lighthouse Park)		$145,000.00	$145,000.00	$0.00	$0.00
	Clarkson Central Link (Renshaw Boulevard, Anthony Waring Park, Waring Green and Melbourne Loop)		$190,000.00	$190,000.00	$0.00	$0.00
	PSP to Mindarie Marina (Rosslare Prom, Fairport Vista, Rochester Drive, McPherson Avenue, Waring Green, Anthony Waring Park, Victorsen Parade, Somerly Drive and Hacienda Drive)		$360,000.00	$360,000.00	$0.00	$0.00
	Hester Avenue to Neerabup Road (Porongurup Drive, Hannaford Drive and Celebration Boulevard)		$310,000.00	$310,000.00	$0.00	$0.00
	Hannaford to Anthony Waring Park (Walyunga Boulevard, Pitchford Glade, Tindal Way and Carberry Square)		$95,000.00	$95,000.00	$0.00	$0.00
	Belleville Gardens and Polglase Fairway (Marmion Avenue to Connolly Drive)		$135,000.00	$135,000.00	$0.00	$0.00
		North Total	$11,510,000.00	$8,510,000.00	$1,500,000.00	$1,500,000.00
	Central					
	Primary Network					
	Yellagonga Cycle Bridge (Yellagonga Regional Park)		$4,120,000.00	$1,470,000.00	$0.00	$2,650,000.00
	Pinjar Road (Wanneroo Road to Joondalup Drive)		$515,000.00	$515,000.00	$0.00	$0.00
	Pinjar Road (Flynn Drive to Joondalup Drive)		$510,000.00	$510,000.00	$0.00	$0.00
	Joondalup Drive (Wanneroo Road to Pinjar Road)		$360,000.00	$360,000.00	$0.00	$0.00
	Yellagonga Cycling Links (Yellagonga Regional Park)		$230,000.00	$230,000.00	$0.00	$0.00
	Secondary Network					
	Dundebar Road (Wanneroo Road to Civic Drive)		$110,000.00	$110,000.00	$0.00	$0.00
	Golf Links Drive (Wanneroo Road to Pinjar Road)		$245,000.00	$245,000.00	$0.00	$0.00
	Cheriton Drive (Golf Links Drive to Joondalup Drive)		$75,000.00	$75,000.00	$0.00	$0.00
	Greenvale Place and Mornington Drive (Joondalup Drive to Pinjar Drive)		$255,000.00	$255,000.00	$0.00	$0.00
	Gradis Boulevard (Old Yanchep Road to Pinjar Road)		$240,000.00	$240,000.00	$0.00	$0.00
	Ghost Gum Boulevard and Honey Possum Park (Joondalup Drive/Pinjar Road to Pellen Turn (potential extension to Flynn Drive)		$215,000.00	$215,000.00	$0.00	$0.00

		Central Total	$6,875,000.00	$4,225,000.00	$0.00	$2,650,000.00
	South					
	Primary Network					
	Hepburn Avenue (Alexander Drive to Greenwood Train Station)		$570,000.00	$570,000.00	$0.00	$0.00
	Gnangara Road (Hartman Drive to Mirrabooka Avenue)		$320,000.00	$320,000.00	$0.00	$0.00
	Gnangara Road (Hartman to Yellagonga Pathway)		$265,000.00	$265,000.00	$0.00	$0.00
	Ocean Reef Road (Wanneroo Road to City of Joondalup Boundary)		$215,000.00	$215,000.00	$0.00	$0.00
	Kingsway (Alexander Drive to Wanneroo Road)		$315,000.00	$315,000.00	$0.00	$0.00
	Mirrabooka Avenue (Ocean Reef Road to Hepburn Avenue)		$415,000.00	$415,000.00	$0.00	$0.00
	Central Wangara North South Link (Ocean Reef Road to Gnangara Road)		$260,000.00	$260,000.00	$0.00	$0.00
		South Total	$2,360,000.00	$2,360,000.00	$0.00	$0.00
		Infrastructure Projects Total	$20,745,000.00	$15,095,000.00	$1,500,000.00	$4,150,000.00
		5 Year Implementation Plan Total	$21,455,000.00	$15,735,000.00	$1,530,000.00	$4,190,000.00
	10 Year Implementation Plan					
	Strategic Improvements					
	Station Links		$500,000.00	$100,000.00	$100,000.00	$300,000.00
	Safe Routes to School		$10,000.00	$10,000.00	$0.00	$0.00
	Cross Sections of City Roads		Design reviews			
	Ongoing Maintenance		$10,000.00	$10,000.00	$0.00	$0.00
	Cycle Design Standards for Developers and Designers		$40,000.00	$20,000.00	$0.00	$20,000.00
		Strategic Improvements Total	$560,000.00	$140,000.00	$100,000.00	$320,000.00
	Data Collection					
	Continued Monitoring and Data Collection		$20,000.00	$20,000.00	$0.00	$0.00
		Data Collection Total	$20,000.00	$20,000.00	$0.00	$0.00
	Investigations/Feasibility Studies					
	Station Links		$650,000.00	$325,000.00	$0.00	$325,000.00
	Lake Joondalep Cycling Bridge		$3,000,000.00	$1,000,000.00	$1,000,000.00	$1,000,000.00
		Invesitgation/Feasibility Studies Total	$3,650,000.00	$1,325,000.00	$1,000,000.00	$1,325,000.00
	Behaviour Change Improvements					
	Cycle Training Schools Education		$10,000.00	$10,000.00	$0.00	$0.00
	Way Finding		$15,000.00	$5,000.00	$5,000.00	$5,000.00
	Bike Mainenance		$10,000.00	$5,000.00	$0.00	$5,000.00
		Behaviour Change Improvements Total	$35,000.00	$20,000.00	$5,000.00	$10,000.00
	Infrastructure Projects					
	North					
	Primary Network					
	Marmion Avenue (Neerabup Road to Lukin Drive)		$525,000.00	$525,000.00	$0.00	$0.00
	Marmion Avenue (Lukin Drive to Yanchep)		$2,565,000.00	$1,565,000.00	$1,000,000.00	$0.00
		North Total	$3,090,000.00	$2,090,000.00	$1,000,000.00	$0.00
	Central					
	Primary Network					
	Joondalup Drive (Pinjar Road to Old Yanchep Road)		$338,000.00	$338,000.00	$0.00	$0.00
	Joondalup Drive (Wanneroo Road to Old Yanchep Road)		$225,000.00	$225,000.00	$0.00	$0.00
	Lenore Road (Ocean Reef Road to Elliott Road)		$417,500.00	$417,500.00	$0.00	$0.00
	Franklin Road (Caporn Road to Elliott Road)		TBA	TBA	$0.00	$0.00
	Flynn Drive (Wanneroo Road to Old Yanchep Road)		TBA	TBA	$0.00	$0.00
	Yellagonga Cycling Links (Yellagonga Regional Park)		$20,000.00	$20,000.00	$0.00	$0.00
	Caporn Street (Franklin Road to Pinjar Road)		TBA	TBA	$0.00	$0.00
	Elliott Road/San Rosa Road (Lake Joondalup to Lenore Road)		$180,000.00	$180,000.00	$0.00	$0.00
	Secondary Network					
	Clarkson Avenue/Yandella Prom (Wanneroo Road to Pinjar Road)		$215,000.00	$215,000.00	$0.00	$0.00
	Joondalup Drive to Ashby East West Link (Waldburg Drive, Titan Way, Berlotto Drive and Carosa Road)		$260,000.00	$260,000.00	$0.00	$0.00
	Lake Joondalup Shared Path to Pinjar Road (Turnwood Vista, Reenner Circle, Monet Drive, Carosa Road and Hollesy Way)		$130,000.00	$130,000.00	$0.00	$0.00
	Lake Joondalup to Wanneroo Town Centre (Ariti Avenue/Jindanga Way)		$130,000.00	$130,000.00	$0.00	$0.00
	Elliott Road to Ocean Reef Road (Wyatt Road, Brooklyn Avenue, Classic Rise and Port Link)		$255,000.00	$255,000.00	$0.00	$0.00
	Lake Joondalup to Lenore Road (East Road, James Spires Road and Scenic Drive)		$260,000.00	$260,000.00	$0.00	$0.00
		Central Total	$2,430,500.00	$2,430,500.00	$0.00	$0.00
	South					
	Primary Network					
	Beach Road (Alexander Drive to Wanneroo Road)		$1,070,000.00	$570,000.00	$0.00	$500,000.00
	Marangaroo Drive (Alexander Drive to Wanneroo Road)		$620,000.00	$620,000.00	$0.00	$0.00
	Ocean Reef Road (Alexander Drive to Wanneroo Road)		$815,000.00	$815,000.00	$0.00	$0.00
	Ocean Reef Road (Wanneroo Road to City of Joondalup Boundary)		$160,000.00	$160,000.00	$0.00	$0.00
	Alexander Drive (Gnangara Road to Hepburn Avenue)		$365,000.00	$365,000.00	$0.00	$0.00
	Alexander Drive (Hepburn Avenue to Beach Road)		$455,000.00	$455,000.00	$0.00	$0.00
	Mirrabooka Avenue (Ocean Reef Road to Hepburn Avenue)		$15,000.00	$15,000.00	$0.00	$0.00
	Mirrabooka Avenue (Hepburn Avenue to Beach Road)		$600,000.00	$600,000.00	$0.00	$0.00
	Lake Goolegal (Hepburn Avenue to Whitfords Avenue)		$100,000.00	$100,000.00	$0.00	$0.00
	Central Wangara North South Link (Ocean Reef Road to Gnangara Road)		$110,000.00	$110,000.00	$0.00	$0.00
	Hartman Drive (Gnangara Road to Hepburn Avenue)		$370,000.00	$370,000.00	$0.00	$0.00
	Central Marangaroo Cycle Link (Chancellor's Rise, Le Grand Gardens and Highclere Boulevard)		$210,000.00	$210,000.00	$0.00	$0.00
	Girrawheen Avenue (Beach Road to Marangaroo Drive)		$310,000.00	$310,000.00	$0.00	$0.00
	Hartman Drive Grade Separation (Wicklow Park)		$1,520,000.00	$1,520,000.00	$0.00	$0.00
	Mirrabooka Avenue (Kingsway Cycle Way)		$1,520,000.00	$1,520,000.00	$0.00	$0.00
	Secondary Network					
	Landsdale Road (Alexander Drive to Hartman Drive)		$380,000.00	$380,000.00	$0.00	$0.00
		South Total	$8,620,000.00	$8,120,000.00	$0.00	$500,000.00
		Infrastructure Projects Total	$14,140,500.00	$12,640,500.00	$1,000,000.00	$500,000.00
		10 Year Implementation Plan Total	$14,805,500.00	$12,845,500.00	$1,105,000.00	$855,000.00
	15 Year Implementation Plan					
	Strategic Improvements					
	Trails Master Plan Implementation		$500,000.00	$250,000.00	$0.00	$250,000.00
	Shared Zones		$200,000.00	$200,000.00	$0.00	$0.00
	Ongoing Maintenance		$10,000.00	$10,000.00	$0.00	$0.00
	Hester Avenue Bridge Across Train Line		$1,000,000.00	$0.00	$0.00	$1,000,000.00
	Travel Plans		$25,000.00	$25,000.00	$0.00	$0.00
		Strategic Improvements Total	$1,735,000.00	$485,000.00	$0.00	$1,250,000.00
	Data Collection					
	Monitoring and Data Collection		$20,000.00	$20,000.00	$0.00	$0.00
		Data Collection Total	$20,000.00	$20,000.00	$0.00	$0.00
	Investigations/Feasibility Studies					
	Cycle Hire Scheme		$500,000.00	$500,000.00	$0.00	$0.00
		Invesitgation/Feasibility Studies Total	$500,000.00	$500,000.00	$0.00	$0.00
	Behaviour Change Improvements					
	Cycle Training Schools Education		$25,000.00	$25,000.00	$0.00	$0.00
	Way Finding		$15,000.00	$15,000.00	$0.00	$0.00

	Bike Maintenance		$10,000.00	$10,000.00	$0.00	$0.00
		Behaviour Change Improvements Total	$50,000.00	$50,000.00	$0.00	$0.00
	Infrastructure Projects					
	North					
	Primary Network					
	Connolly Drive (Lukin Drive to Neerabup Road)		$20,000.00	$20,000.00	$0.00	$0.00
	Connolly Drive (Neerabup Road to CoJ Boundary)		$215,000.00	$215,000.00	$0.00	$0.00
	Grade Separation (Connolly Drive/Hester Avenue Roundabout)		$1,500,000.00	$1,500,000.00	$0.00	$0.00
		North Total	$1,735,000.00	$1,735,000.00	$0.00	$0.00
	Central					
	Primary Network					
	Yellagonga Cycling Links (Yellagonga Regional Park)		$1,200,000.00	$1,200,000.00	$0.00	$0.00
		Central Total	$1,200,000.00	$1,200,000.00	$0.00	$0.00
	South					
	Primary Network					
	Lake Goolegal (Cycle Bridge connecting Kingsway Cycling Facility to Robinson Cycle Track)		$3,050,000.00	$1,050,000.00	$0.00	$2,000,000.00
	Yellongonga Regional Park (Whitfords Avenue to Ocean Reef Road)		$500,000.00	$500,000.00	$0.00	$0.00
	Secondary Network					
	Butterworth Avenue/Koondoola Avenue (Beach Road to Mirrabooka Avenue and Marangaroo Drive)		$260,000.00	$260,000.00	$0.00	$0.00
	The Avenue (Marangaroo Drive to Hepburn Avenue)		$135,000.00	$135,000.00	$0.00	$0.00
	Amberton Avenue/Hainsworth Avenue (Beach Road to Marangaroo Drive)		$160,000.00	$160,000.00	$0.00	$0.00
	Heathfield Drive, Queensway Road (Mirrabooka Avenue to Alexander Drive)		$260,000.00	$260,000.00	$0.00	$0.00
	Furness Road to Rawlinson Drive (MacDermott Parade, Ashdale Boulevard, Evandale Road, Redcliffe Avenue and Bloodwood Drive)		$310,000.00	$310,000.00	$0.00	$0.00
	Hartman Drive to Mirrabooka Avenue (Furness Road, Ashdale Boulevard, Wicklow Park and Belviour Park)		$310,000.00	$310,000.00	$0.00	$0.00
	Prindiville Drive (Hartman Drive to Yellagonga Pathway)		$210,000.00	$210,000.00	$0.00	$0.00
	Gnangara Road to Hepburn Avenue (Klarborg Drive, Olivedale Drive, Amstel Park, Corbin Gate, Russell Road, Sovarno Drive and Bellerve Boulevard)		$260,000.00	$260,000.00	$0.00	$0.00
	Giralt Road (Hepburn Avenue to Marangaroo Drive)		$160,000.00	$160,000.00	$0.00	$0.00
	Rawlinson Drive (Mirrabooka Avenue to Central Marangaroo Cycle Link)		$170,000.00	$170,000.00	$0.00	$0.00
	Templeton Drive/ Blackmore Avenue/ Hudson Avenue (Wanneroo Road to Beach Road, Girrawheen Avenue and Marangaroo Drive)		$600,000.00	$600,000.00	$0.00	$0.00
	Alexander Drive to Marangaroo Cycle Link (Richenda Crescent, Berkley Road, Goldsworthy Entrance, Axford Road, Picton Terrace, Marangaroo Drive, Tyndall Crescent and Shaftsbury Avenue)		$410,000.00	$410,000.00	$0.00	$0.00
	Kingsway to Marangaroo Drive (Rangeview Road, Axford Road, Derbi Road and Marianne Way)		$260,000.00	$260,000.00	$0.00	$0.00
		South Total	$7,055,000.00	$5,055,000.00	$0.00	$2,000,000.00
		Infrastructure Projects Total	$9,990,000.00	$7,990,000.00	$0.00	$2,000,000.00
		15 Year Implementation Plan Total	$12,295,000.00	$9,045,000.00	$0.00	$3,250,000.00

10. Potential Interim Links

The following sealed shoulders were identified as part of the Your Move consultation process and identified for measures to help support cycling. These facilities should be considered for separate cycling facilities and are included as identified routes for future consideration.

Project	Location	Description
Sealed Shoulders North Wanneroo	Landbeach Boulevard (Connolly to Randstone)	Local Road
	Marmion Avenue (Neerabup to Graceful)	Major Highway
	Neerabup Road (Marmion to Connolly)	Connecting Road
	Ocean Keys Boulevard (Celebration to Marmion)	Connecting Road
	Key Largo Drive (Belleville to Neerabup)	Local Road
	Pensacola Terrace (Marmion to Belleville)	Local Road
	Lower Keys Drive (Belleville to Neerabup)	Local Road
	Connolly Drive (Neerabup to Benenden)	Connecting Road
	Exmouth Drive (Benenden to Clipstone)	Local Road
	Hester Avenue (Hidden Valley and Renshaw)	Connecting Road
	Lukin Drive (Marmion to Redington)	Local Road
	Jindalee Boulevard (Maritime to Marmion)	Local Road
	Kingsbridge Boulevard (Marmion to Connolly)	Local Road
	Shepperton Drive (Captiva to Landbeach)	Local Road
	Celebration Boulevard (Somerly to Ocean Keys)	Local Road
	Benenden Avenue (Connolly to Portobello)	Local Road
	Northcliffe Avenue (Ocean Keys to Connolly)	Local Road
	Hinchinbrook Avenue (Lukin to Ronsard)	Local Road
	Barquentine Avenue (Jindalee to Seagull)	Local Road
	Hampshire Drive (Marmion to Investigator)	Local Road
	Bradman Drive (Lukin to Marchwood)	Local Road
	Homebush Drive (Bradman to Connolly	Local Road
Sealed Shoulders Central Wanneroo	Dundebar Road (Wanneroo to Civic)	Connecting Road
	Joseph Banks Boulevard (Joondalup to Grandis)	Local Road
	Pinjar Road (Glasshouse to Wanneroo)	Connecting Road
	Grandis Boulevard (Pinjar to Joseph Banks)	Local Road
Sealed Shoulders South Wanneroo	Alexander Drive (Hepburn to Gnangara)	Connecting Road
	Mirrabooka Avenue (Beach to Errina)	Connecting Road
	Hartman Drive (Inspiration to Kemp)	Connecting Road

11. Review of 2008 Wanneroo Bike Plan

In May 2008, the City of Wanneroo with the assistance of GHD produced a report which addressed a new bike plan incorporating the entire City of Wanneroo including the extension of Marmion Avenue and the Northern Railway suburbs.

The 2008 Bike Plan reviewed arterial and local distributors to determine the existing bicycle facilities and missing links supported by an inventory list of assessment results and a list of future pathway works including missing paths and upgrading paths and their indicative costs.

As part of the development of Cycle Wanneroo, a chapter by chapter review of the Plan has been conducted which identified outstanding works that have not been completed. These outstanding works should be coordinated with the development of any new work identified in Cycle Wanneroo. It is important to note that since this plan was produced the approach to cycling has changed significantly and the development and benefits of a connected separate network have been identified and are now being promoted.

A summary of the review is detailed below:

11.1 Input from Users

The City of Wanneroo was involved in the 2008 Bike plan in terms of discussing requirements and inputs for the Bike Plan. GHD on behalf of the City of Wanneroo consulted a number of other stakeholders during the development of the bike plan included Bicycle Transport Alliance, Bicycle User Groups and members within Wanneroo.

The 2008 Bike Plan documented the key issues raised by these groups.

11.2 Existing Bike Plan

GHD conducted a review of all existing arterial and local roads to determine the existing bicycle facilities and any shortfalls in the on and off road network at the time. The City of Wanneroo selected a number of regional roads, arterial roads and local roads within the City's boundary for examination in the 2008 Bike Plan. The full list of these roads were documented in the 2008 Bike Plan. In addition, nine school sites were examined and the shortfalls were identified and discussed, the proposed works were recommended in Chapter 7 of the Bike Plan - Proposed Works and Cost Estimate.

This information can be used to check against the current bike facilities at these roads and school sites.

11.3 Planning for Cyclists

In this section, the 2008 Bike Plan identified the requirements for cyclists with adoption of Austroads Guide to Traffic Engineering Practice Part 14: Bicycles (note that this document has been replaced with Austroads Guide to Road Design Part 6A: Pedestrian and Cyclist Paths) and Liveable Neighbourhoods, by WAPC.

Seven broad groups of cyclists were identified in 2008 Bike Plan for which bike plans should cater for and each group should be accommodated as part of the planning of cyclists.

Although the Liveable Neighbourhoods document is still valid, the Austroads standard used in the 2008 Bike Plan is out of date and new bike facilities should be designed and implemented according to the new standards. The 2008 Bike Plan quoted a large number of requirements from Liveable Neighbourhoods for providing pedestrian and cyclist movement networks, but very little recommendation of where these should be implemented in relation to the bike plan for Wanneroo.

In section 4.3 of the 2008 Bike Plan, it was recommended that "all developments should consider the need for shower and change room facilities" - now referred as "end-of-trip" facilities. This practice has since been

encouraged for developments and it is evident that there is significant increase in cyclists at workplaces with "end-of-trip" facilities.

The 2008 Bike Plan also recommended the City of Wanneroo to provide bicycle racks at nominated locations with regular monitoring and maintenance. However, examples of standard drawings included in Appendix E seem to be out of date and therefore are no long appropriate to refer to.

11.4 Crash Investigation

The 2008 Bike Plan collated five year crash statistics involving pedestrians and cyclists within the City of Wanneroo between January 2002 and December 2006. The crash data were provided by the City of Wanneroo.

Some fatal crash locations were identified as follows:

- Marmion Ave SKL 2.79 - Bicycle
- Montrose Ave SLK 0.25 - Pedestrian
- Pinjar Rd SLK 1.27 - Pedestrian

The roads where two or more bicycle or pedestrian involved crashes have occurred were also identified in the 2008 Bike Plan. Total recorded crashes were listed in **Appendix A** together with a map identifying crash locations at intersections.

The crash analysis provided some focus for future pedestrian/ cycle facilities, however, targeted treatment methods were not recommended as part of the Plan to reduce these crashes in the 2008 Bike Plan.

11.5 Structure Plan Overview

The 2008 Bike Plan reviewed the City of Wanneroo's structure plans, considered the cycling and pedestrian aspects of structure plans and provided some general comments. It was recommended that all structure plans should consider connectivity to the Perth Bicycle Network (PBN) where possible. The structure plans of the following Wanneroo regions were discussed:

- Two Rocks Northern Precinct
- Regent Waters (South)
- East Wanneroo Cells 1 to 8
- Mindarie Keys
- Neerabup Industrial Area
- St Andrews District
- Butler - Jindalee District
- Butler Ridgewood
- Capricorn
- Alkimos Eglinton District
- Clarkson

The comments provided were brief, mostly discrete and specific to each Structure Plan rather than overall principles or strategies for cycle plan.

11.6 Conclusion

Overall, the 2008 Bike Plan provided several comprehensive inventory lists of missing bike paths and existing paths that need upgrade within the Wanneroo road network. Indicative cost estimates for these recommended future works were provided in the Bike Plan. The Bike Plan suggested a tremendous amount of works and it's

very unlikely the City would complete all suggested works within the Five year works program. A clear priority of the works should be reviewed and an achievable works program should be set out for the City of Wanneroo.

In summary, the 2008 Bike Plan identified approximately 83km of missing bike paths and approximately 67 km of path upgrade within the City of Wanneroo's local roads. These included bicycle treatment options for controlled access point (CAP) implemented by the City for improving traffic operation around some local roads.

In addition, a further 53 km of missing and upgrading paths were identified during the arterial road shared path examination and were documented in Appendix C together with indicative costs.

12. Network Mapping

375000

380000

6500000

6495000

Wanneroo Road

Marmion Avenue

Purpose built facilities

Link

Alkimos

Link

Connect Jindalee to Yanchep along coast

Butler Stn

Path along freeway

Butler

MTB path

Difficult Crossing Point

Difficult Crossing Points

Ridgewood

Quinns Rocks

Merriwa

Difficult Crossing Points

Too narrow

Safe Crossing Points

Make safer

Safe Crossing Points

Repair stations

Clarkson

Difficult Crossing Points

Clarkson Stn

Wanneroo Road

Safe Crossing Point

Coastal path

Tamala Park

Connect with underpasses

MTB 7km XCO trail area / land ownership issue / link to nearby path

0 1 2 4

kilometres

GINGIN, SHIRE OF

Seatrees Estate

Breakwater Drive

Two Rocks

WANNEROO, CITY OF

Two Rocks Road

INDIAN OCEAN

0 0.5 1 2

kilometres

Two Rocks Road

Road is too narrow

Yanchep

WANNEROO, CITY OF

Yanchep Beach Road

Marmion Avenue

INDIAN OCEAN

0 0.5 1 2

kilometres

Wanneroo Bicycle Routes (Primary) - North

Legend

Activity Centres

- Facility Centre (Shop, Park, Recreation)
- Strategic Centres / Stations
- School
- Proposed Link (DoT)
- Link for Investigation (DoT)
- Missing Links Identified by Jacobs
- Missing Links Identified by DoT

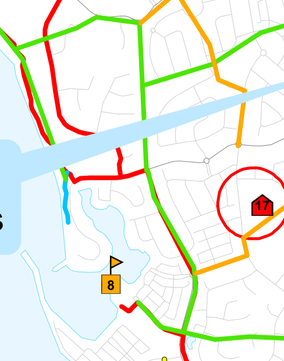
Strava Bicycle Route

- High Use
- Medium Use

Roads

- Main Road
- Minor Road
- Railways

- LGA Boundary
- Dangerous Bridge
- Problem Intersection
- Problem Roundabout
- Proposed Corridor - East-West
- Proposed Corridor - North-South
- Secondary Attractor
- Primary Attractor



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Projection	Map Grid Australia, Zone 50
Sources	Topography: Open Street Map 2015 Landgate SLIP WMS Service (PTA-008 and LGATE-006)
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385000

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6490000

6485000

Reopen for cyclists

Too narrow

Cycle path to join up road - bikes only

Link

Forced onto footpath

Too narrow

Too narrow

Possible education centre

Safe Crossing Point

More cycle paths in this area

Upgrade

Link between lakes

Commuter destination

Road is too narrow

Wannerooroo Road

Burns Beach Road

Joondalup Drive

Joondalup Stn

Edgewater Stn

Whitfords Stn

Shenton Avenue

Hodges Drive

Mitchell Freeway

Ocean Reef Road

Whitfords Avenue

Wanneroo Road

Joondalup Drive

Lake Joondalup

Wanneroo

Woodvale

Craigie

Wangara

Gnangara Road

Mirrabooka Avenue

Two Rocks Road

Breakwater Drive

Seatrees Estate

Two Rocks

INDIAN OCEAN

GINGIN, SHIRE OF

CITY OF WANNEROO

0 0.5 1 2

kilometres

Yanchep

Yanchep Beach Road

Marmion Avenue

WANNEROO, CITY OF

0 1 2 4

kilometres

Wanneroo Bicycle Routes (Primary) - Central

Legend

Activity Centres

- Facility Centre (Shop, Park, Recreation)
- Strategic Centres / Stations
- School

- Proposed Link (DoT)
- Link for Investigation (DoT)
- Missing Links Identified by Jacobs
- Missing Links Identified by DoT

Strava Bicycle Route

- High Use
- Medium Use

Roads

- Main Road
- Minor Road
- Railways

- LGA Boundary
- Dangerous Bridge
- Problem Intersection
- Problem Roundabout
- Proposed Corridor - East-West
- Proposed Corridor - North-South
- Secondary Attractor
- Primary Attractor

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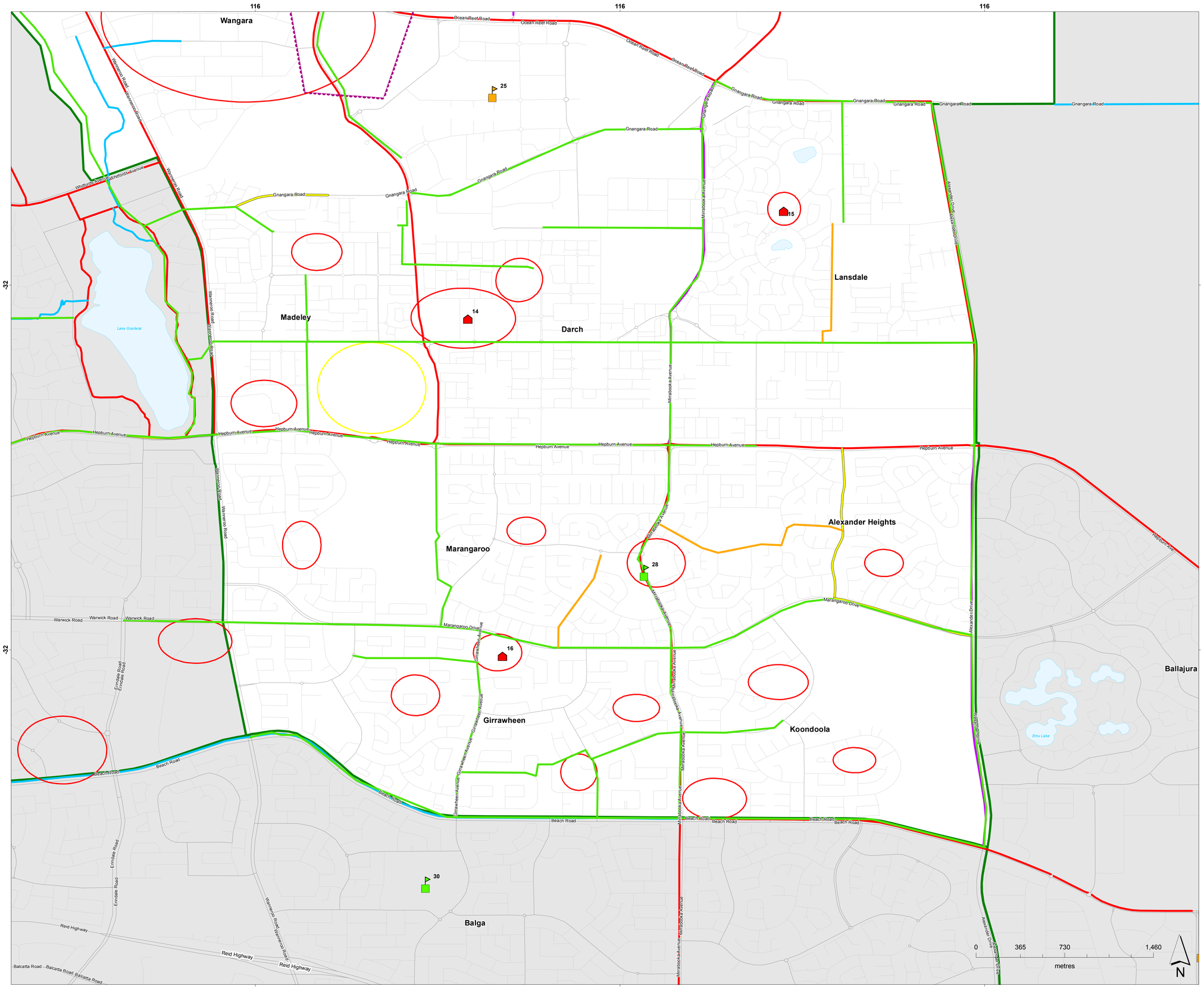
Wanneroo Bicycle Routes (Primary) - South



Legend

- Facility Centre (Shop, Park, Recreation)
- Strategic Centres / Stations
- School
- Dangerous Bridge
- Problem Intersection
- Problem Roundabout
- Link for Investigation (DoT)
- Proposed Link (DoT)
- Proposed Corridor - East-West
- Proposed Corridor - North-South
- Secondary Attractor
- Primary Attractor
- Missing Links Identified by DoT
- Missing Links Identified by Jacobs

Strava Bicycle Route

- High Use
- Medium Use

LGA

- LGA Boundary

Roads

- Main Road
- Minor Road
- Railways

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Wanneroo Road

Marmion Avenue

Link

Purpose built facilities

Alkimos

Link

Connect Jindalee to Yanchep along coast

Butler Stn

Path along freeway

Butler

MTB path

Difficult Crossing Point

Difficult Crossing Points

Ridgewood

Link

Quinns Rocks

Merriwa

Difficult Crossing Points

Too narrow

Safe Crossing Points

Make safer

Safe Crossing Points

Clarkson

Repair stations

Difficult Crossing Points

Clarkson Stn

Wanneroo Road

Safe Crossing Point

Coastal path

Tamala Park

Connect with underpasses

MTB 7km XCO trail area / land ownership issue / link to nearby path

0 1 2 4

kilometres

GINGIN, SHIRE OF

Seatrees Estate

Breakwater Drive

Two Rocks

WANNEROO, CITY OF

Two Rocks Road

INDIAN OCEAN

0 0.5 1 2

kilometres

Two Rocks Road

Road is too narrow

17

20

Yanchep Beach Road

WANNEROO, CITY OF

Yanchep

3

4

2

12

5

Marmion Avenue

INDIAN OCEAN

0 0.5 1 2

kilometres

Wanneroo Bicycle Routes (Secondary) - North

Legend

Activity Centres

Facility Centre (Shop, Park, Recreation)

Strategic Centres / Stations

School

Proposed Link (DoT)

Link for Investigation (DoT)

Missing Links Identified by Jacobs

Missing Links Identified by DoT

Strava Bicycle Route

High Use

Medium Use

Roads

Main Road

Minor Road

Railways

LGA Boundary

Dangerous Bridge

Problem Intersection

Problem Roundabout

Proposed Corridor - East-West

Proposed Corridor - North-South

Secondary Attractor

Primary Attractor

Scale (A1) 1:20,000
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Projection Map Grid Australia, Zone 50

Sources Topography: Open Street Map 2015
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6485000

Reopen for cyclists

Too narrow

Cycle path to join up road - bikes only

Link

Forced onto footpath

Too narrow

Possible education centre

Safe Crossing Point

Too narrow

More cycle paths in this area

Upgrade

Commuter destination

Link between lakes

Wannerooroo Road

Burns Beach Road

Joondalup Drive

Shenton Avenue

Hodges Drive

Mitchell Freeway

Ocean Reef Road

Whitfords Avenue

Wanneroo Road

Breakwater Drive

Two Rocks Road

Yanchep Beach Road

Marmion Avenue

Gnangara Road

Mirrabooka Avenue

Lake Joondalup

GINGIN, SHIRE OF

WANNEROO, CITY OF

INDIAN OCEAN

Seatrees Estate

Two Rocks

Yanchep

Joondalup

Joondalup Stn

Edgewater Stn

Whitfords Stn

Craigie

Woodvale

Wanneroo

Wangara

Road is too narrow

0 1 2 4

kilometres

Wanneroo Bicycle Routes (Secondary) - Central

Legend

Activity Centres

- Facility Centre (Shop, Park, Recreation)
- Strategic Centres / Stations
- School
- Proposed Link (DoT)
- Link for Investigation (DoT)
- Missing Links Identified by Jacobs
- Missing Links Identified by DoT

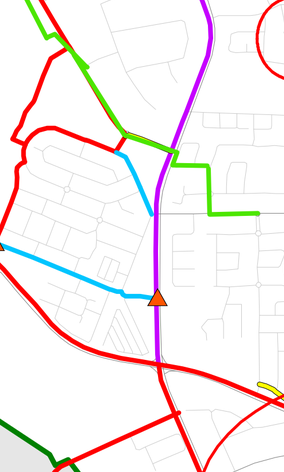
Strava Bicycle Route

- High Use
- Medium Use

Roads

- Main Road
- Minor Road
- Railways

- LGA Boundary
- Dangerous Bridge
- Problem Intersection
- Problem Roundabout
- Proposed Corridor - East-West
- Proposed Corridor - North-South
- Secondary Attractor
- Primary Attractor



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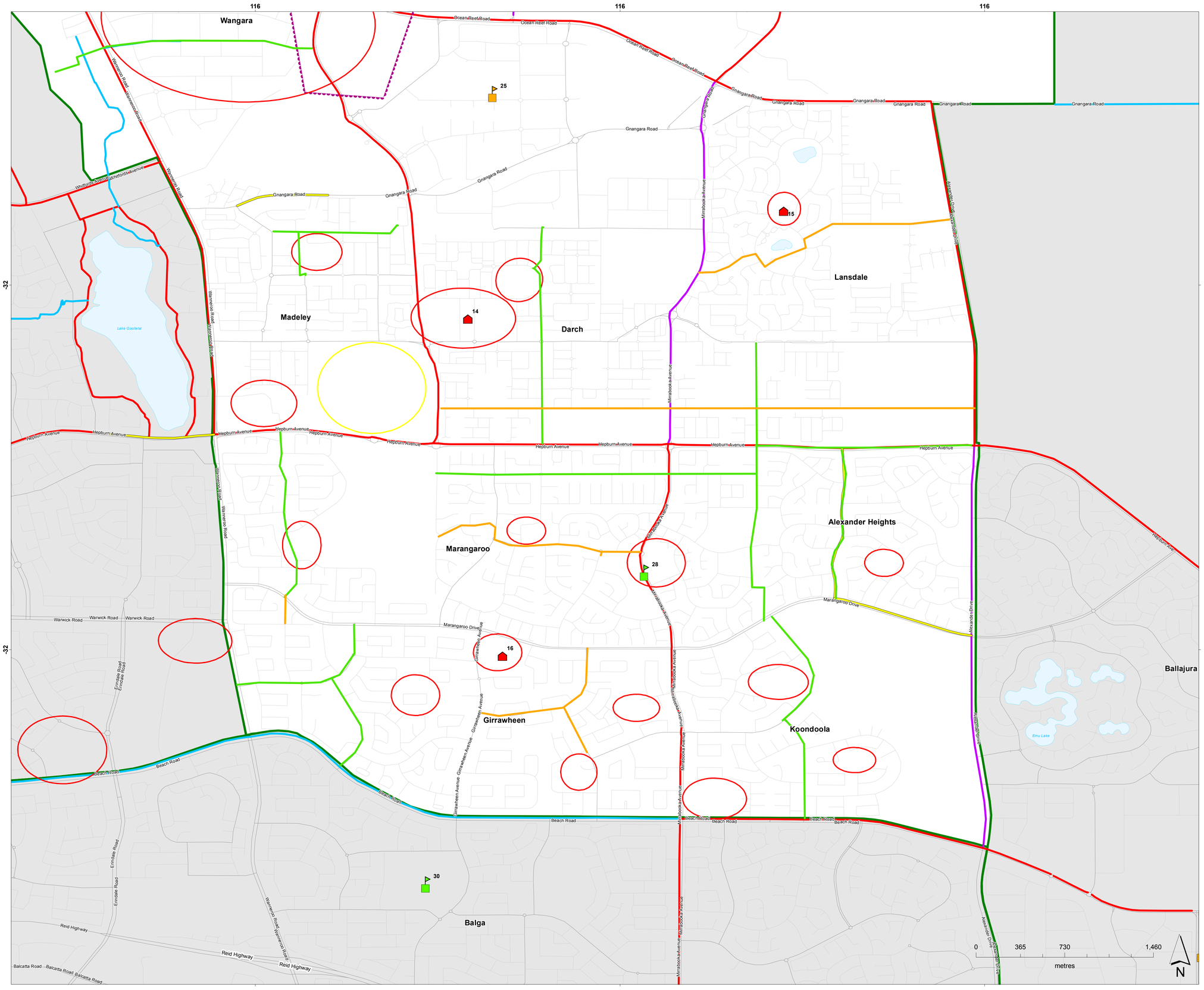

Legend

- Facility Centre (Shop, Park, Recreation)
- Strategic Centres / Stations
- School
- Dangerous Bridge
- Problem Intersection
- Problem Roundabout
- Link for Investigation (DoT)
- Proposed Link (DoT)
- Proposed Corridor - East-West
- Proposed Corridor - North-South
- Secondary Attractor
- Primary Attractor
- Missing Links Identified by DoT
- Missing Links Identified by Jacobs

Strava Bicycle Route

- High Use
- Medium Use

LGA

- LGA Boundary

Roads

- Main Road
- Minor Road
- Railways

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Wanneroo Bicycle Routes (Secondary) - South

Connolly Drive Concept Plans

Note: There are a number of large roundabouts along Connolly Drive. In the longer term, it may be necessary to either re-design these intersections or in some cases provide grade separation for cyclists.

IMPLEMENT ROAD CLOSURE

BUTLER TRAIN STATION PSP

CONVERT TO CYCLE STREET

INSTALL 4M WIDE CROSSING POINT

CONVERT TO CYCLE STREET

INSTALL 3M BIDIRECTIONAL CYCLE LANE (KERB SEPERATED)

CONVERT EXISTING PARKING TO BI DIRECTIONAL CYCLE LANE

INSTALL 3M BIDIRECTIONAL CYCLE LANE (KERB SEPERATED)

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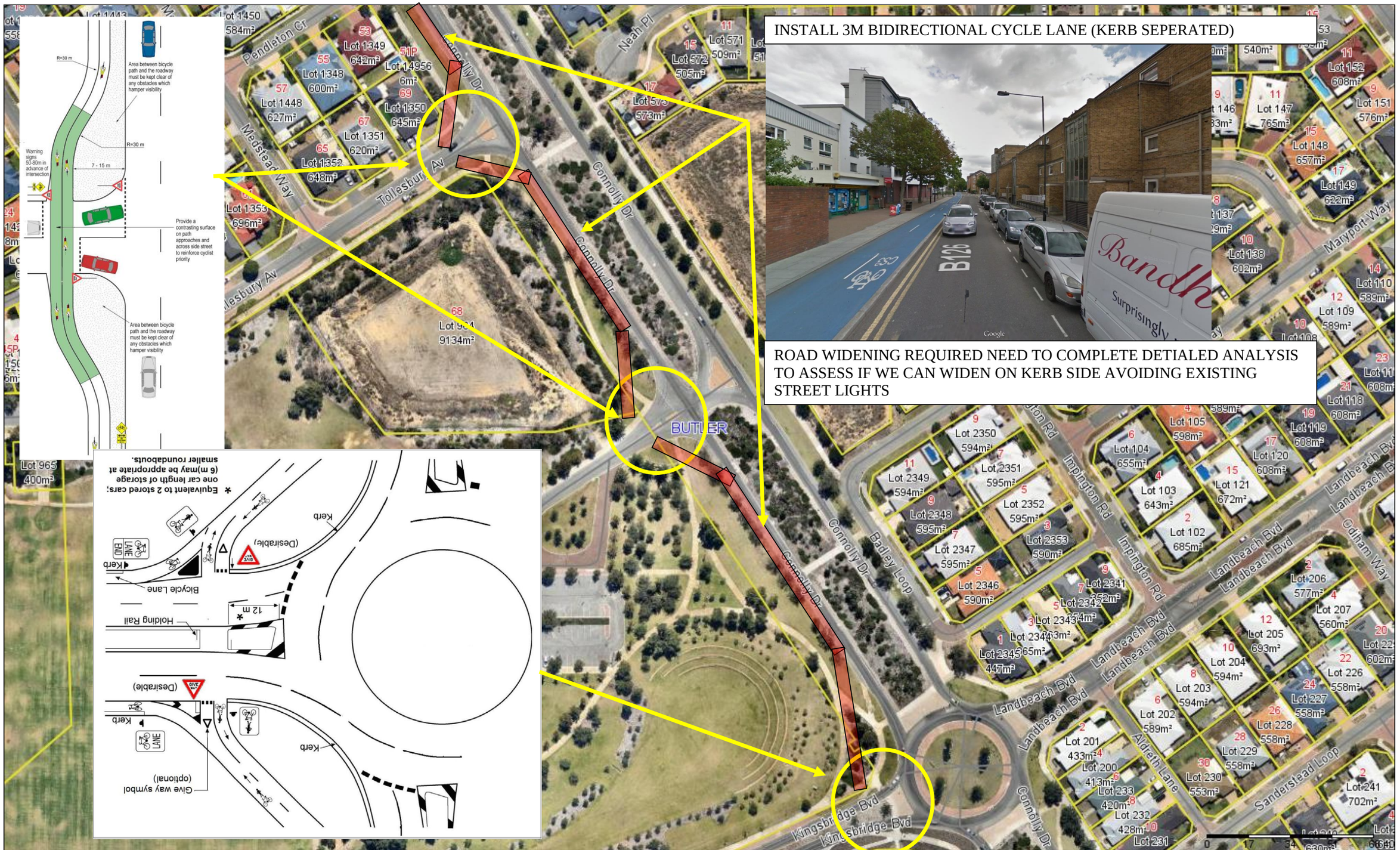
INSTALL 3M BIDIRECTIONAL CYCLE LANE (KERB SEPERATED)

ROAD WIDENING REQUIRED NEED TO COMPLETE DETIALED ANALYSIS TO ASSESS IF WE CAN WIDEN ON KERB SIDE AVOIDING EXISTING STREET LIGHTS



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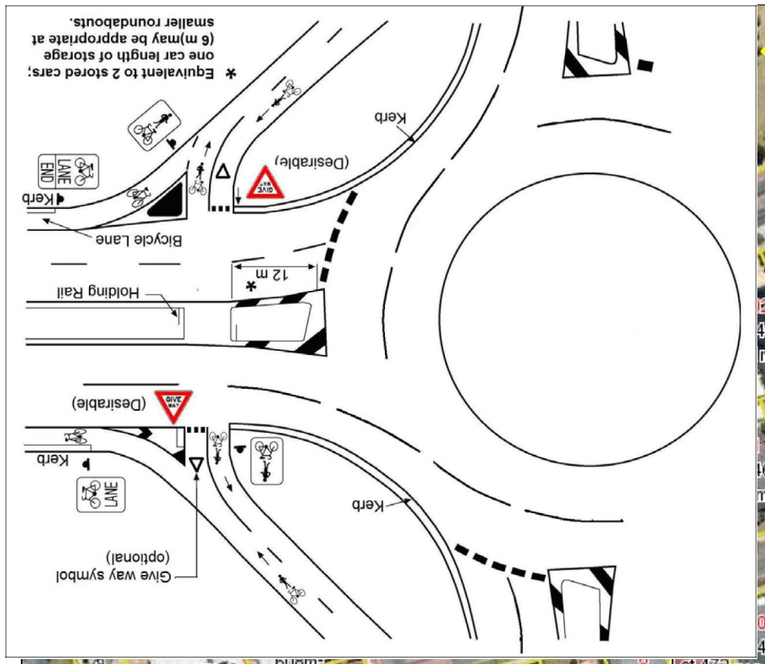

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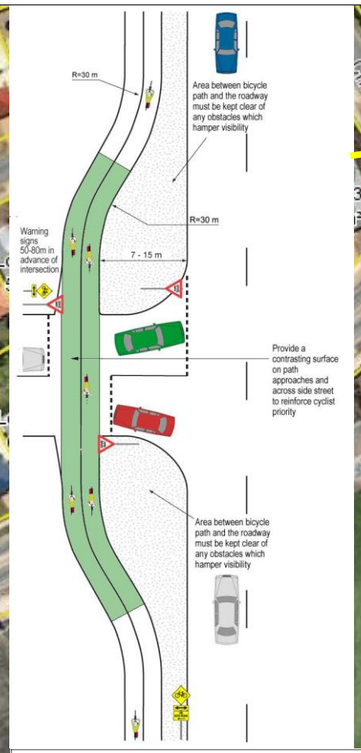

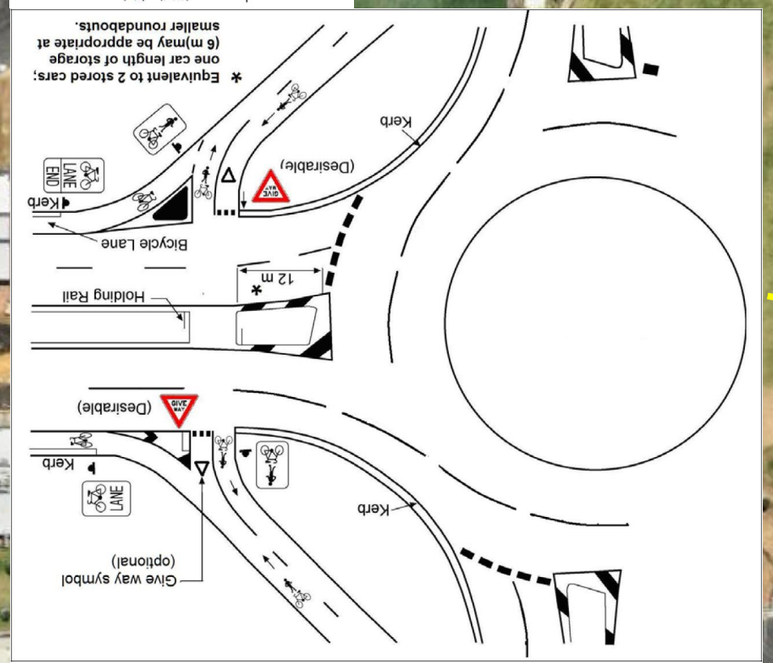

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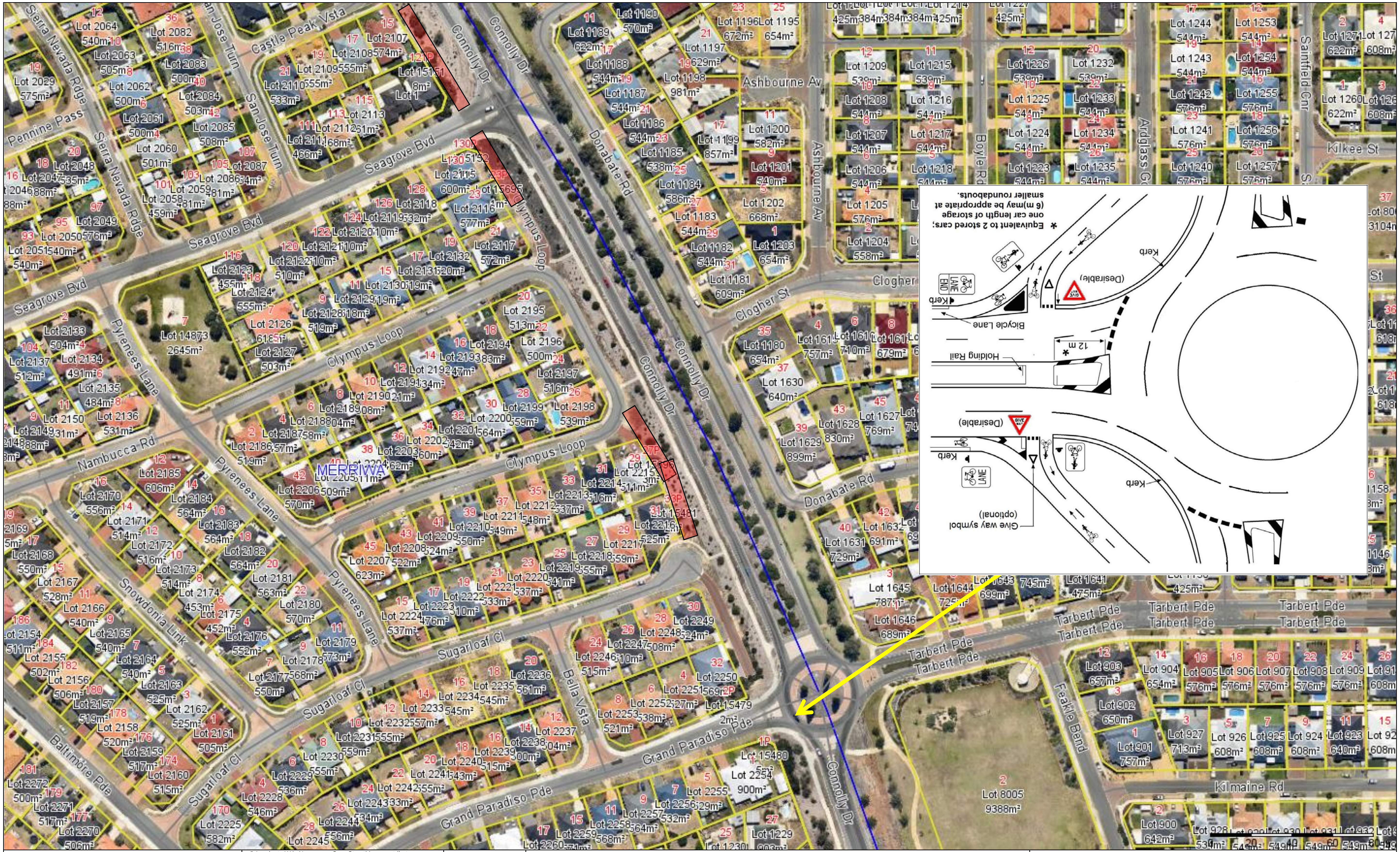

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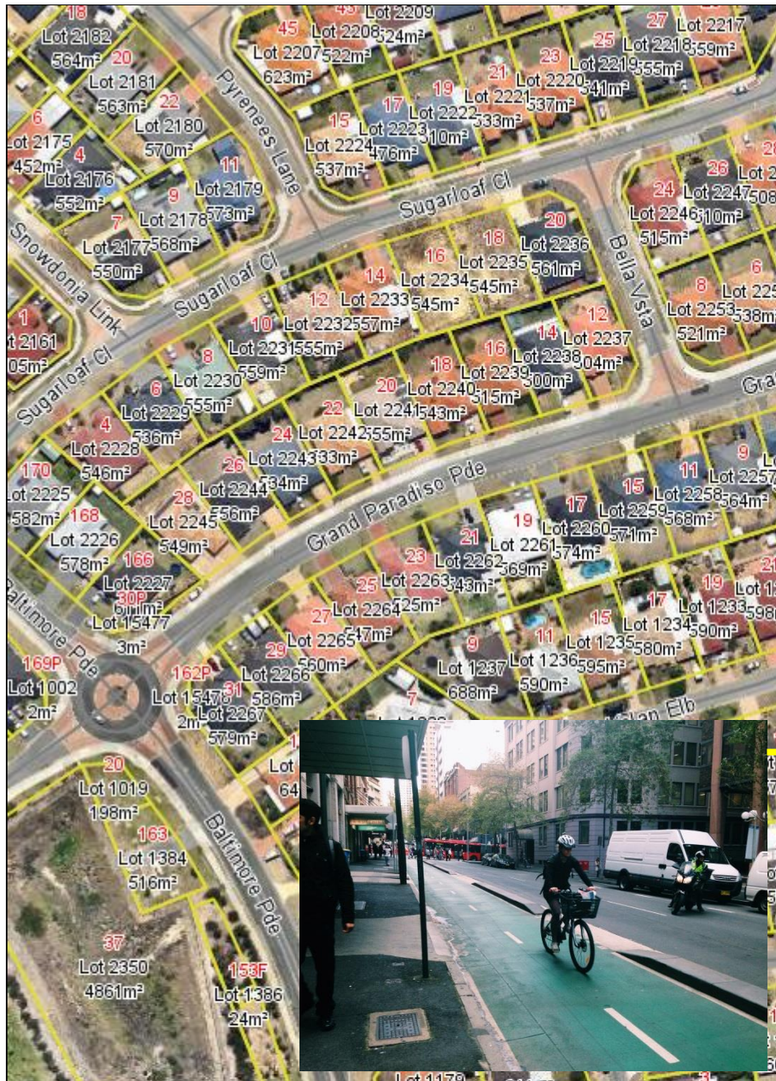

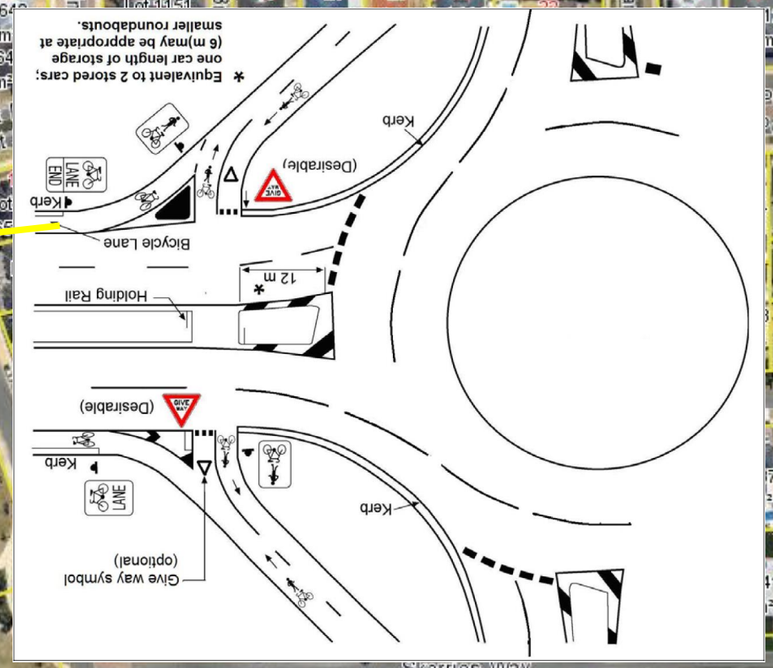

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MERRIWA
RIDGEWOOD
Coldstream Cct
Harcus Rtt
Calder Rtt
Pascoe Rtt
Helby Cl
Alum Gn
Earl Ct
Connolly Dr
Hinchinbrook Av
Feakle Bend
Eastwood St
Ryton Lane
Widnes Lane
Eydon Way
Westall Link
Daydream Way
Shelburne Gdns
Dayman Gn
Ronsard View
Leveque Rmbl
Breaksea Way
Prudhoe Mews
Lot 2472
1827m²
Lot 12425
4689m²
Lot 8004
3316m²
0
20
40
60
80

City of Wanneroo

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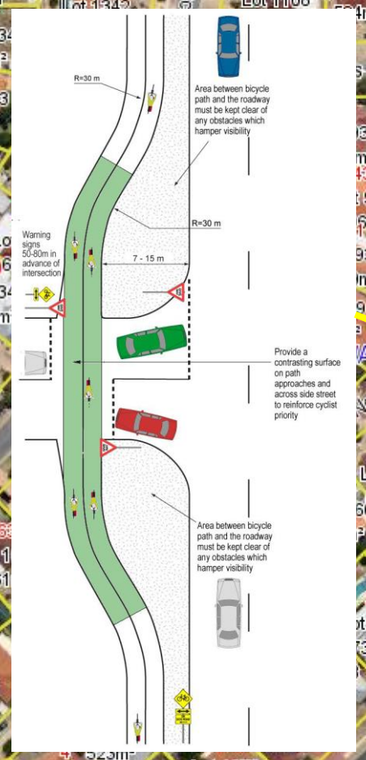

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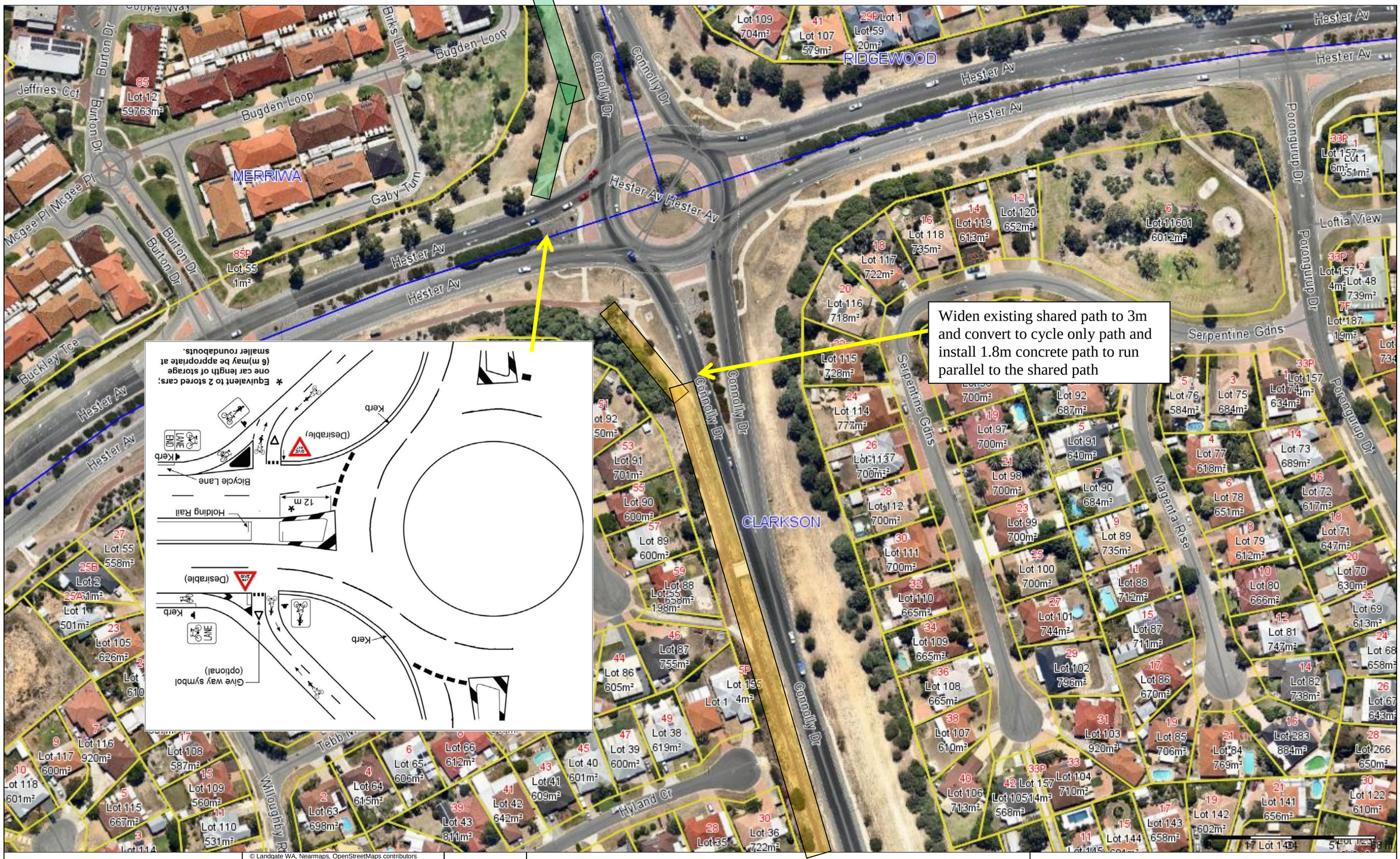

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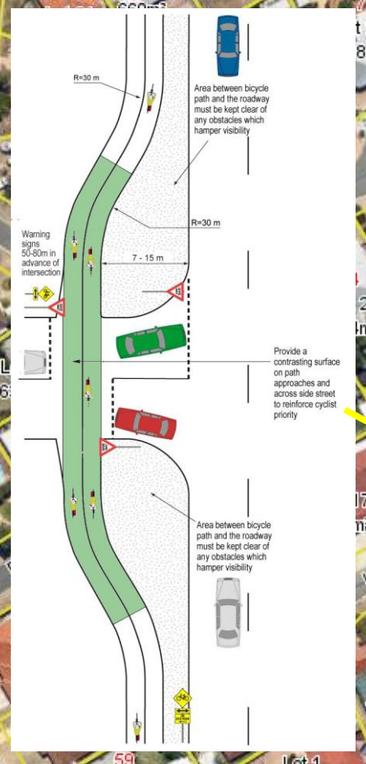
Widen existing shared path to 3m and convert to cycle only path and install 1.8m concrete path to run parallel to the shared path



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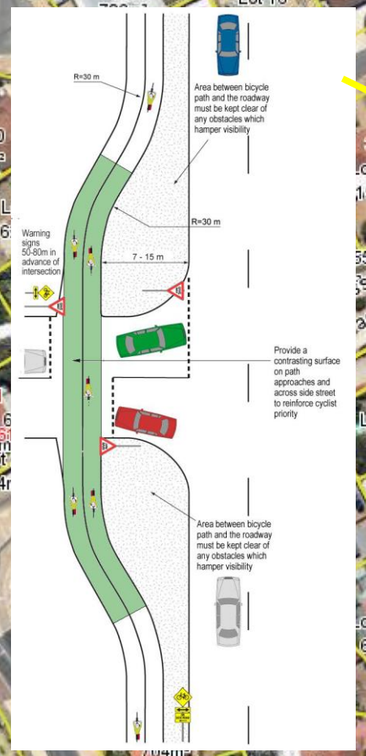

Widen existing shared path to 3m and convert to cycle only path and install 1.8m concrete path to run parallel to the shared path

City of Wanneroo

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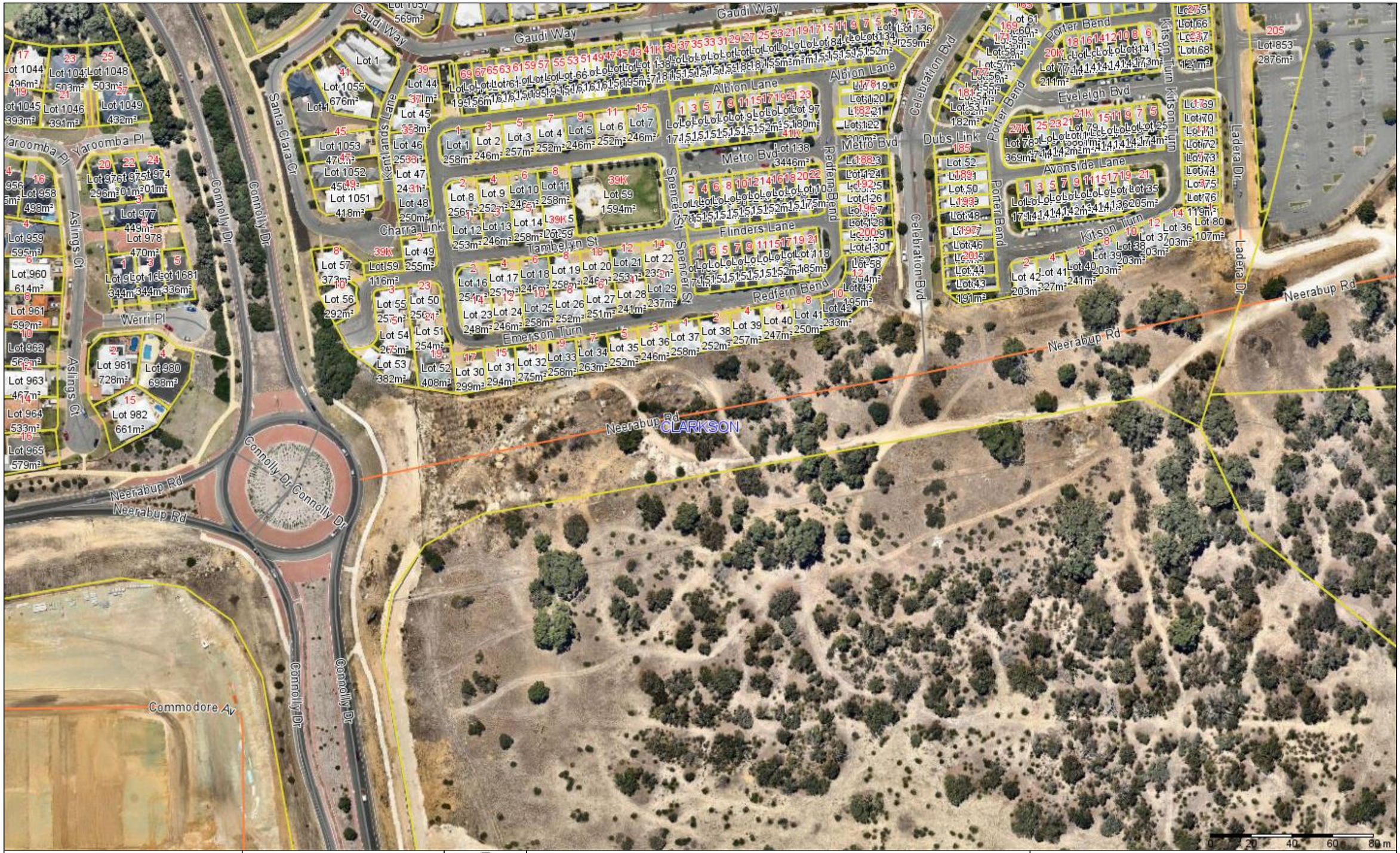

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https://www.bicyclenetwork.com.au/general/better-conditions/2845/

13. Intersections and Cycle Design Standards

13.1 Intersections

A potentially major barrier to cycling and the perception of cyclist's safety is concern with operation, safety and complexity for cyclists at intersections. This includes access crossings and progression through these for cyclists. Traffic signals are the responsibility of Main Roads, but these can be both a perceived problem and a safety concern.

13.2 Design of Roundabouts

Similarly, roundabouts (particularly 2 lane roundabouts) are difficult for cyclists to negotiate and do have a history of crash problems. The most common crash type for cyclists at roundabouts involves a motor vehicle entering the roundabout and colliding with a cyclist on the circulatory carriageway. This often appears to be because the driver does not see the cyclist using the roundabout.

Of the crashes in the past 5 years involving a cyclist, 28% have been at a roundabout.

Roundabout design was an issue raised during the 2015 visit by Dutch Transport Planners (refer **Section 2.1.3**). It is understood that possible changes to roundabout design standards may be assessed by the Department of Transport.

13.3 AustRoads

Design guidance for pedestrian and cycle paths can be found in the Austroads Guide to Road Design Part 6A which provides guidance for road designers and provides some geometric design requirements. Part 4 provides some intersections and crossing design layouts while Roundabouts are covered in Part 4B.

These documents are readily available and easily accessible and can provide guidance for all designers. The illustrations below show typical layouts for Intersections, Shared Paths and Separated Paths from the Austroads Design Guides.

Cycling Aspects of Austroads Guides provides information about:

- planning and traffic management considerations
- design guidance relating to on-road and off-road bicycle facilities
- construction and maintenance considerations
- provision for cyclists at structures, traffic control devices and end of trip facilities.

This is the second edition of Cycling Aspects of Austroads Guides. This edition has been revised to ensure its currency and to clarify and highlight links to other Austroads Guides. Key updates include:

- improving cross-references to other Austroads guidance, including summary cross-reference tables at the beginning of each section
- providing broader consideration of other Austroads Guides applicable to cycling
- updating the report to reflect new editions of the Guide to Traffic Management (Parts 3, 6 and 9) and Guide to Road Safety (Part 1)
- enhancing or clarifying guidance for topics such as path crossings of roads, access considerations at freeway interchanges, construction and maintenance considerations and pavements for cycling.

The full publication and a quick reference guide are available. In both documents, the Guide icons are linked to the relevant guide on this website:

https://www.onlinepublications.austroads.com.au/items/AP-G88-14

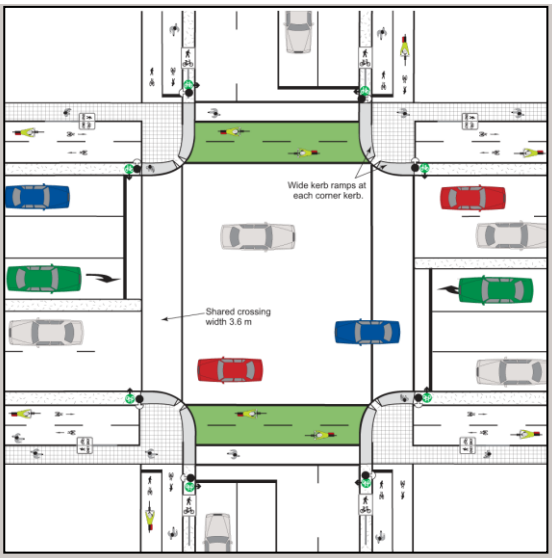

Figure 13.1: Austroads: Shared Path and One-Way Bicycle Path at Signalised Intersections

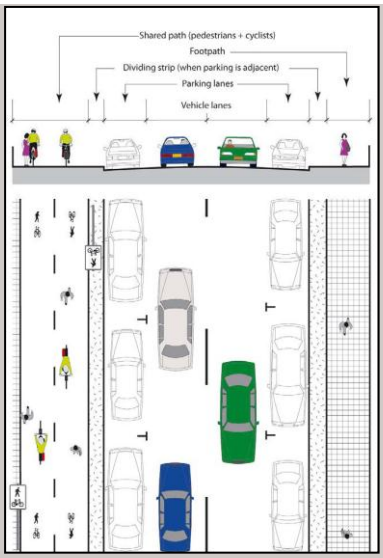

Figure 13.2: Austroads: Shared Path in a Road Reservation

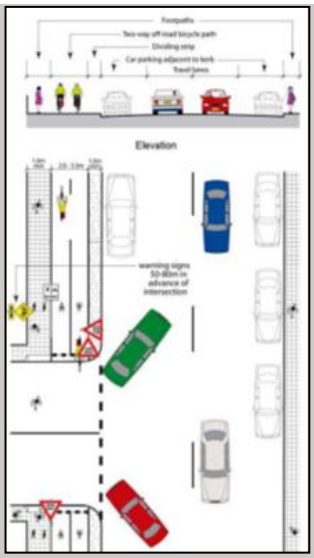

Figure 13.3: Austroads: Separated Path in a Road Reservation

Appendix A. Bike Count Data

Road Name	Section	Start Date	End Date	Number of Days	Direction	Total Count	Average Daily Count	Average Workday Count	Average AM Peak Count (WD)	Average PM Peak Count (WD)	Mean Speed (kph)	85th % Speed (kph)	NOTES
2015 Bike Count Data													
Hester Avenue	East of Marmion Ave	20/01/2015	29/01/2015	10	EB	54	5.4	5.2	0.3	0.3	18.8	22.3	North side shared path
Marmion Avenue	North of Ashcote Gate	20/01/2015	29/01/2015	10	NB	170	17	15.9	3.1	0.4	33.3	38.2	East side cycle lane and shared path
Marmion Avenue	North of Quinns Road	20/01/2015	29/01/2015	10	SB & NB	318	31.8	32.8	4.0	1.1	25.0	31.3	West side cycle lane and shared path
Ocean Drive	North of Pearce Road	20/01/2015	29/01/2015	10	NB	412	41.2	41.1	4.1	2.9	19.8	24.5	West side shared path
PSP Butler Train Station		20/01/2015	29/01/2015	10	SB	143	14.3	17.1	1.1	1.4	18.9	22.7	Shared path
Scenic Drive	North of Church Street	8/01/2015	16/01/2015	9	NB & SB	1176	130.7	138.1	13.2	12.0	22.8	28.8	Shared path
Beach Road	East of Wanneroo Road	8/01/2015	16/01/2015	9	NB & SB	171	19	28.4	2.0	3.5	26.7	32	Shared path
Hepburn Avenue	West of Giralt Road	8/01/2015	16/01/2015	9	EB & WB	188	20.9	23.4	0.8	1.7	22.2	30.6	Shared path and cycle lane
Marangaroo Drive	West of Mirabooka Avenue	8/01/2015	16/01/2015	9	EB & WB	45	5.0	5.2	1.3	0.5	18.0	24.5	Shared path and cycle lane
Mirrabooka Avenue	South of Golders Way	8/01/2015	16/01/2015	9	WB & EB	112	12.4	15.7	1.5	1.2	25.7	32.0	Shared path and cycle lane

Appendix B. Crash Data

No.	Date	Time	Severity	Type	Light Condition	Location	Road Feature	MR Nature
1	10/11/2012	1037	Hospital	Midblock	Daylight	On Cway	-	-
2	18/05/2010	1810	PDO Minor	Intersection	Dark - Street Lights on	On Cway	Roundabout	Right Angle
3	1/01/2011	1000	Medical	Intersection	Daylight	On Cway	Roundabout	Sideswipe same dirn
4	2/12/2010	0715	Hospital	Midblock	Daylight	On Cway	Roundabout	Non-Collision
5	18/09/2010	1730	PDO Minor	Intersection	Daylight	On Cway	Roundabout	Right Turn through
6	9/04/2010	1740	Medical	Intersection	Daylight	On Cway	3 way intersection (T-Junction)	Right Turn through
7	21/05/2013	0600	PDO Major	Intersection	Dark - Street Lights on	On Cway	3 way intersection (T-Junction)	Right Angle
8	13/03/2012	0702	Hospital	Midblock	Daylight	On Cway	Driveway	Rear End
9	27/09/2009	1600	Medical	Intersection	Daylight	On Cway	3 way intersection (T-Junction)	Right Angle
10	23/08/2011	1723	Hospital	Midblock	Daylight	Sidewalk	Driveway	Non-Collision
11	31/07/2013	1735	PDO Major	Intersection	Dawn or Dusk	On Cway	Roundabout	Right Angle
12	16/05/2012	1935	PDO Minor	Intersection	Dark - Street Lights on	On Cway	4-way Intx	Non-Collision
13	3/10/2009	0650	PDO Minor	Intersection	Daylight	On Cway	3 way intersection (T-Junction)	Right Angle
14	5/11/2010	1200	Hospital	Midblock	Daylight	Sidewalk	Driveway	Right Angle
15	23/05/2012	1645	Medical	Midblock	Daylight	On Cway	Driveway	Right Turn through
16	31/05/2009	1915	Medical	Intersection	Dark - Street Lights on	On Cway	Roundabout	Right Angle
17	25/11/2009	0640	Hospital	Intersection	Daylight	On Cway	3 way intersection (T-Junction)	Sideswipe same dirn
18	14/07/2009	0730	Medical	Intersection	Daylight	On Cway	Roundabout	Sideswipe same dirn
19	24/09/2009	0725	Hospital	Intersection	Daylight	On Cway	3 way intersection (T-Junction)	Sideswipe same dirn
20	12/12/2010	1337	PDO Minor	Midblock	Daylight	On Cway	Pedestrian Refuge Island	Right Angle
21	20/07/2010	1313	Hospital	Midblock	Daylight	On Cway	-	Rear End

No.	Date	Time	Severity	Type	Light Condition	Location	Road Feature	MR Nature
22	2/01/2013	1700	PDO Major	Intersection	Daylight	On Cway	3 way intersection (T-Junction)	Right Angle
23	31/03/2009	1520	Hospital	Intersection	Daylight	On Cway	Roundabout	Sideswipe same dirn
24	29/07/2011	1604	Medical	Intersection	Daylight	On Cway	3 way intersection (T-Junction)	Right Angle
25	2/08/2012	1400	Medical	Midblock	Daylight	On Cway	-	Right Angle
26	26/01/2010	2145	PDO Minor	Intersection	Dark - Street Lights on	On Cway	3 way intersection (T-Junction)	Right Angle
27	18/02/2012	1715	PDO Minor	Intersection	Daylight	On Cway	3 way intersection (T-Junction)	Right Angle
28	29/10/2009	0750	Hospital	Intersection	Daylight	On Cway	Roundabout	Right Angle
29	8/01/2009	2038	Hospital	Intersection	Dawn or Dusk	On Cway	4-way Intx	Right Angle
30	27/09/2009	0910	PDO Minor	Intersection	Daylight	On Cway	4-way Intx	Sideswipe same dirn
31	7/04/2011	1830	PDO Minor	Midblock	Dark - Street Lights on	On Cway	Driveway	-
32	31/03/2012	1021	Hospital	Midblock	Daylight	On Cway	-	-