ATTACHMENT A

GTAconsultants

City of Kwinana
Bike and Walk Plan

November 2018

City of Kwinana

Bike and Walk Plan

November 2018

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Table of Contents

Appendices

Figures

Tables

1. Executive Summary

The City of Kwinana (City) engaged GTA Consultants in February 2017 to undertake a bike and walk plan that developed both a long-term network that fulfils the Department of Transport's objectives for the region, and a network and an implementation plan that is tailored to the local conditions, appreciating the needs of the individual communities within Kwinana.

Neighbourhood plans have been developed for each of the individual communities in Kwinana to compliment the long-term regional network plan.

There is recognised concern about people's health in the Kwinana community which can be addressed through regular exercise, obtainable with 1-2km cycling trips and walking in local neighbourhoods. A socio-economic study has been undertaken as part of this plan to aid the understanding of these issues in the local context (refer to Hames Sharley report in Appendix C).

Two aspects were discovered in Kwinana which provide an opportunity to improve the health and well-being of the Kwinana community:

i the extensive array of parks, reserves and natural bushland blooming with wildflowers in season, create local destinations for neighbourhoods, within an accessible distance to cycle and walk and to be physically active within;
ii its position as a separate urban area buffered from neighbouring localities of Rockingham and Cockburn with nature reserves and semi-rural land. The major road corridors of Thomas Road, the Kwinana Freeway, Rockingham Road and Mandurah Road surround the townsite meaning through-traffic does not need to traverse the residential township, creating an environment tailored towards local movement across neighbourhoods rather than regional movement across local government boundaries.

The City of Kwinana's *Bike and Walk Plan 2018-2023* is not an attempt to solve every active transport related issue within the City. Constraints to the City's budget and external funding sources required the plan to concentrate on locations where achievable results would be obtained. To streamline this process, the plan has divided the local government into:

i the residential area (which itself is separated into individual neighbourhoods);
ii the surrounding area of industrial, bushland, developing semi-rural land.

1.1 Kwinana Neighbourhoods

Kwinana is defined as the residential area south of Thomas Road and west of Kwinana Freeway, and excludes the bushland and industrial zones that surround the residential area. Kwinana has been separated into 9 neighbourhoods, each is unique with a sense of self-identity within Kwinana described in Table 1.1.

The neighbourhood plan concept defined a long-term network and implementation priorities for each neighbourhood. The strategic network plan for the City of Kwinana was formed by combining the network plans for each of the neighbourhoods.

The plan concentrates in the project implementation within neighbourhoods to increase measurable benefits for local communities rather than implementation of projects distributed across the entire local government. Bertram, Medina and Leda have been recommended as the focus for implementation as outlined in Table 1.1.

Table 1.1: City of Kwinana Neighbourhoods

Neighbourhood	Description
Bertram	Despite being a newer suburb, consultation revealed deficiencies in the footpath network and pedestrian crossings particularly around Bertram Primary School and Bertram Community Centre. In response to this, a Bertram Pedestrian Improvement Plan has been prepared to address the most pressing issues for implementation. Kings College receives significant catchment from Bertram with potential for cycling and walking trips, and therefore has been included in the plan for Bertram.
Medina	The first suburb of Kwinana and closest to the industrial area, Medina is to become an active community through east-west links from the Loop Trail to Gilmore Avenue enhancing the network to the Shopping Centre, Primary School, Thomas Oval as well as Medina Oval. Medina is to become a demonstration neighbourhood for safe active streets and has an environmentally conscious community expected to be supportive.
Leda	Leda is not well connected and highly deficient in footpaths. The focus is on enhancing the footpath network to parks to provide central meeting points for the community and encourage physical activity. Leda Primary School is another important local destination.
Calista / Kwinana Town Centre	Calista and Kwinana City Centre are combined as a neighbourhood for this plan. The focus is on crossing improvements for Chisham Avenue and Gilmore Avenue as identified in the consultation. Long-term network priorities focus on Gilmore College, the Adventure Park and Aged Care facilities. Crossing improvements require a separate study and further consultation to determine the exact treatments.
Parmelia	Large neighbourhood with a focus on a secondary bicycle route from the Kwinana Train Station to Kwinana City Centre (Darius Wells Library). Other minor projects are proposed that have been raised in the consultation and determined in the existing network evaluation. Future cycling and walking plans should consider separating Parmelia into four neighbourhoods (detailed in Figure 15.1).
Wellard – "Homestead Ridge"	A special residential zoned estate in a picturesque setting constructed without footpaths requiring people with prams or in wheel chairs to use the road. Consultation revealed a desire for footpath construction. Focus on connections to Wellard Oval to the north of the estate. Liaison with Homestead Ridge Progress Association required.
Wellard – "The Village"	Limited focus for implementation for the main Wellard town centre area and residential estate referred to as "The Village" with neighbourhood connectors identified for further development in subsequent plans.
Wellard – "Providence"	The new estates of Wellard include Providence, Emerald Park and Sunrise. Neighbourhood connectors are identified with guidance for development of Bollard Bulrush.
Orelia	An older suburb with limited focus for implementation to ensure investment is concentrated on the other neighbourhoods where the benefit has been identified for specific projects.

The long-term network and implementation plan for each neighbourhood are to be updated every five-years with each update to the Kwinana bike and walk plan. Individual neighbourhood plans are detailed in Chapter 10.

1.2 Surrounding Area

The areas surrounding the Kwinana residential areas include industrial land, new developing land and bushland. The industrial area is not a priority in the *Bike and Walk Plan* due to the uncertainties around the current State Government planning for the area and to allow the City to concentrate on residential neighbourhoods. As part of the long-term regional cycling network in the surrounding area, a primary route is proposed along the freight line running north from Hope Valley, running to the west of Kwinana and then east towards Mundijong. This route also connects into a similar proposal within the City of Cockburn Bike and Walk Plan. Table 1.2 describes the surrounding area and its context which is predominately long-term focused, with the short-term focus limited to the provision of cycling in new subdivisions.

Table 1.2: City of Kwinana Surrounding Area

Surrounding Area	Description
Industrial Area (Kwinana Beach, Naval Base, Hope Valley, Postans)	Kwinana Beach (west and east of Rockingham Road), Naval Base and Hope Valley require a separate study to design the pedestrian and cycling network in conjunction with the industries involved to ensure employees can cycle to work and walk to lunchtime delicatessens etc. without the need to walk on roads frequented with heavy vehicles. In general, there is a need for shared paths on roads such as Mason Road and Donaldson Road however these are not included in the implementation plan. The development of Latitude 32 in Hope Valley needs to incorporate adequate off-road facilities for people walking and cycling. Postans has less demand for a walking or cycling study. A secondary cycling route between Kwinana and Rockingham is proposed to run through the Kwinana industrial area (Kwinana Beach Road).
Future Development (Wandi, Mandogalup, Casuarina, Anketell, Wellard East) (Section 18 of main report)	Kwinana's semi-rural land to the east and north-east is presently undergoing development into housing estates, where the population of Kwinana is expected to more than double in the next 20 years. The opportunity to design a pedestrian and cycling network is a focus of this plan. Honeywood Estate is an example of the transformation of parts of Wandi from semi-rural to residential housing. Connections between Honeywood and Aubin Grove, and between Mandogalup's new development and Hammond Park are necessary, along with the connections to the principal shared path adjacent to the Kwinana Freeway.
Surrounding Bushland (e.g. Leda Nature Reserve, The Spectacles)	This land incorporates the Kwinana Loop Trail, along with the Tramway Reserves Trail[1] proposed from Yangebup to Baldivis, and a long-term proposal for a cycling and walking facility on the Dampier to Bunbury Natural Gas Pipeline corridor.

[1] http://www.southwestgroup.com.au/wp-content/uploads/2016/12/Tramway-Trail-Development-Plan-2015-FINAL-lr.pdf

1.3 Long-Term Regional Cycling Network

Cycling corridors have been identified to inform the consultation with State Government on the long-term regional cycling network. These routes can be implemented as opportunities arise such as road resurfacing or widening, or land redevelopment. However, there is a focus on shorter local trips for a larger proportion of the population rather than accommodating for commuter cycling of longer distances which requires significant investment to a smaller proportion of the population.

Six routes are proposed that form the primary cycling network. These routes use major road and rail reserves and are to be grade separated (Table 1.3).

Table 1.3: City of Kwinana Primary Routes

Route	Location	Status
Kwinana Freeway	Freeway reserve	Existing
Kwinana Train Station to Rockingham Train Station	Rail reserve	Future
Rockingham Road	Road reserve	Future
Kwinana Freight Line	Rail reserve	Future
Fremantle Rockingham Controlled Access Highway	Road reserve	Future
Mundijong Road	Road reserve	Future

Ten routes are proposed to form the secondary cycling network, connecting key destinations in Kwinana and to destinations of adjacent local governments (Table 1.4). These have been prioritised based on potential demand to the destinations.

Table 1.4: City of Kwinana Secondary Routes

Priority	Route	Adjoining Local Government
1	Kwinana City Centre to Kwinana Train Station	-
2	Kwinana Train Station to Rockingham Train Station (alternative route to principal shared path in reserve)	Rockingham
3	Kwinana City Centre to Rockingham Beach	Rockingham
4	Wellard Square to Cockburn Central	Cockburn
5	Kwinana City Centre to Coogee	Cockburn
6	Kwinana Beach to Armadale City Centre	Armadale
7	Kwinana City Centre to Wellard Square	-
8	Kwinana City Centre to Rockingham City Centre	Rockingham
9	Kwinana Train Station to Byford	Serpentine Jarrahdale
10	Kwinana City Centre to Mundijong	Serpentine Jarrahdale

1.4 Implementation Plan

The implementation plan identified 5 key projects for priority action (Table 1.5). These are the most important projects for the City of Kwinana (some programmed at the time of this plan).

Table 1.5: City of Kwinana implementation plan key projects

Priority	Project	Destinations
K1	Tranby Way, Bertram – 440m footpath (220m on each side) 2m wide for entire length	Bertram Primary School
K2	Walgreen Crescent, Calista – 160m footpath from Moulton St to Gilmore Ave 2m wide (south side) - **COMPLETED**	Kwinana Adventure Park
K3	Rowley Road, Wandi – 300m shared path Lyon St to Freeway 2.5m wide (south side) - **COMPLETED**	Freeway PSP
K4	Thomas Road, Casuarina – 2km shared path Marri Park Dr to Kwinana Freeway 2.5m wide (south side)	Marri Park
K5	Wellard Road, Wellard – 1.8km shared path from Bertram Rd to Leda Blvd 2.5m wide (west side)	Wellard Park Providence Estate

Secondary Routes

Three secondary routes are proposed in the implementation plan (Table 1.6).

Table 1.6: Secondary Routes to Design

Priority	Project
S1	Design of Kwinana Train Station to Kwinana Town Centre secondary route (years 1-2 design – refer to Table 1.7 for construction)
S2	Design of Kwinana Train Station to Rockingham Train Station secondary route as an alternative route to railway line PSP (years 2-3 design)
S3	Design of Kwinana City Centre to Rockingham Beach secondary route together with City of Rockingham (years 3-4 design)

The secondary route from Kwinana Train Station to Kwinana City Centre (Station to Centre route) is the priority to implement. Some suggested works are provided in Table 1.7.

Table 1.7: Station to Centre Route – suggested works to implement

Priority	Project
S1-1	Sulphur Road – 180m bicycle lane (westbound Nottingham Parkway to Durrant Avenue)
S1-2	Sulphur Road – 180m bicycle lane (westbound Parmelia Avenue to Kirkland Way)
S1-3	Pavement marking on all access roads (bicycle stencils)
S1-4	Chisham Avenue – 1.1km bi-directional lane (north side Meares Ave to Parmelia Ave)
S1-5	Path upgrade through Hunt Park (Chisham Ave to Hunt Place)
S1-6	Safe active street (SAS) treatment – 420m on Hunt Place and Cowling Way
S1-7	Upgrade crossings of Parmelia Avenue at Chisham Avenue and Cowling Way (raised plateau crossings)
S1-8	Parmelia Avenue – 650m bi-directional lane (east side Chisham Avenue to Sulphur Road)
S1-9	Warner Road – 650m shared path (south side Parmelia Avenue to Sicklemore Road)
S1-10	Safe active street treatment – 1.5km Preston Road, Adamson Road (east of Preston), Sicklemore Road (north of Adamson)
S1-11	Adamson Road – 300m shared path (north side Sulphur Road to Preston Road)
S1-12	Optional: Connection to North Parmelia Primary School to be explored through liaison with school and residents (local bicycle boulevard or shared path treatment on Dawson Way and path upgrade and lighting between Dawson and school)
S1-13	Liaise with PTA to remove car parking on shared path on Sulphur Road at station (bollards and or enforcement)

Neighbourhood Implementation Plans

Projects identified within the neighbourhood plans that are a priority in the implementation plan are provided in Table 1.8 to Table 1.17. Where practical, the City will aim to complete projects within a neighbourhood before progressing to the next neighbourhood plan.

Table 1.8: Neighbourhood plans – implementation priority

Priority	Project	Destinations
N1	Bertram pedestrian improvement plan (see Table 1.9 for details)	Bertram Community Centre Bertram Primary School Kings College
N2	Medina neighbourhood plan (Table 1.10)	Medina Shopping Centre Medina Primary School Harry Mcguigan Park Thomas & Medina Ovals
N3	Leda neighbourhood plan (Table 1.11)	Riley, Rogan Parks Sloan's Cottage & Reserve, Djilba Reserve
N4	Kwinana City Centre and Calista neighbourhood priorities (Table 1.12)	Adventure Park Darius Wells Kwinana Marketplace
N5	Parmelia neighbourhood priorities (Table 1.13)	Skottowe Park Kwinana Train Station
N6	Homestead Ridge (Wellard) neighbourhood priorities (Table 1.14)	Wellard Park
N7	The Village (Wellard), Providence and Orelia neighbourhood priorities (Table 1.15 to Table 1.17)	Wellard Town Centre Abingdon Park Orelia Shopping Centre

Bertram Pedestrian Improvement Plan

Table 1.9: Bertram neighbourhood – implementation plan

Priority	Project
Key Project	Tranby Way (footpath on both sides) – 440m total
B1	Trusty Way (crossing at Price Parkway)
B2	Sulphur Road – 230m of shared path from Sicklemore Road to existing path over bridge (south side)[2]
B3	Johnson Road crossing (Ascot Parkway north / and Ascot Parkway south)
B4	Johnson Road crossing (Whiteman Crescent)
B5	Chieftain Street 450m footpath from Moombaki to Parkfield (south side)
B6	Eliza Street – 200m footpath (north side)
B7	Unicorn Street – 220m footpath (east side)
B8	Yelka Street – 250m footpath (east side)
B9	Chipperton Road – 400m footpath from Moombaki to Parkfield
B10	Orient Way – 100m footpath from Parkfield to Westmoreland including pedestrian crossing of Parkfield
B11	Parkfield Boulevard crossing (install kerb ramp at east side of Ganges)
B12	Moombaki Avenue crossing (redirect crossing of Champion Drive terminating in roundabout)
B13	Trusty Way – 100m footpath on west side through car park) * liaise with Primary School about location and crossing points of car park entry / exit
B14	Daintree Loop – 250m shared path from Whiteman Crescent to Principal Shared Path (south side)

[2] Although the project location is in Parmelia, this project benefits the Bertram community rather than Parmelia community due to its location east of the train station

Priority	Project
B15	Daniels Place (install kerb ramps near Greenham Way and at cul-de-sac to connect to Bertram Road shared path)
B16	Lotus Court (provide footpath connection from cul-de-sac to existing path for a more direct link to Bertram Road shared path)
B17	McKenzie Corner (install kerb ramp at cul-de-sac to Bertram Road's shared path)
B18	McKenzie Corner (install kerb ramp at 90-degree bend to Bertram Road's shared path)
B19	Greenham Way (install kerb ramp to Bertram Road's shared path just west of path intersection)
B20	John Forrest Circuit west (install kerb ramp and small path connection to Bertram Road's shared path)
B22	Millbrook Avenue crossing (path connection and kerb ramp at Camborne App)
B23	Safe Active Streets – design and construction of 550m of treatments incl. 30km/h speeds on Champion Drive (Mangart Road to Hero Crescent)

1.4.1 Medina

Table 1.10: Medina neighbourhood – implementation plan

Priority	Project	Destinations
M1	Brownwell Crescent – 600m footpath (2m) on east side from car park to Gilmore Avenue (south)	Medina Oval
M2	Medina bicycle parking – relocate Cora racks in laneway to IGA entrance and replace with U-rails; add designed U-rails to Green Barista Café entrance with planter boxes in consultation with owner; add U-rail in front of bakery	Medina Shopping Centre
M3	Budden Way – 230m footpath (2m) on southern side from Grover Way to Medina Avenue (liaison with Medina school required with implications on street parking)	Medina Primary School Medina Shopping Centre
M4	Safe Active Streets (stage 1) – design and construction of 1km of treatments incl. 30km/h speeds on Atkinson Road, Wheelock Road, Harley Way (north of Wheelock)	Thomas Oval Medina Shopping Centre Medina Oval
M5	Safe Active Streets (stage 2) – design and construction of 1.6 km of treatments incl. 30km/h speeds on Bingfield Road W, Tucker Street, Hubbard Way, Westcott Road	Kwinana Loop Trail Thomas Oval Medina Shopping Centre
M6	Safe Active Street (stage 3) – design and construction of 900m of treatments incl. 30km/h on Pace (west of Harley), Harley Way, Kirkus Road	Medina Shopping Centre Medina Oval
M7	Design proposal for Medina Avenue – potential for boulevard cycling route to continue through centre of Medina and Calista, to be considered in comparison to a separate path facility raised at intersections or protected bicycle lanes (all through traffic to use Gilmore Avenue, noting Medina is a local bus route, with opportunity for innovative treatments at Summerton roundabout such as a raised pedestrian / cyclist crossings)	Medina Shopping Centre Medina Primary School
M8	Pace Road pedestrian crossing on the main street of Medina and undertake design project	Medina Shopping Centre
M9	Walkability Enhancement Plan (Stage 2) – more detailed consultation and network analysis to determine deficiencies and improvements especially the standard of crossings, e.g. path condition, kerb ramps and tactile ground surface indicators	-
M10	Create neighbourhood wayfinding strategy in consultation with Medina Progress Association to local destinations such as Kwinana Loop Trail, Medina Primary School, Harry Mcguigan Park, Medina Shopping Centre, Medina Oval, Kwinana Adventure Park, Darius Wells Library, Kwinana Marketplace	-
M11	Medina Avenue – repair footpath damaged by tree root (maintenance)	-

1.4.2 Leda

Table 1.11: Leda neighbourhood – implementation plan

Priority	Project
L1	Crossing of Edwards Street at Dixon Mews – 50m of footpath to connect path in English Retreat Park to path on west side of Edwards and create crossing points)
L2	Edwards Street – 50m footpath from Feilman to shopping centre entrance (on east side) – require suitable crossing to path on west side, or preferably continue to English Retreat park (350m total)
L3	Porter Gardens – 230m of footpath from existing path termination to pedestrian access way to Edwards Street (on south side)
L4	Riley Place – 280m of footpath from Sloan to Riley Park (on south side, liaise with residents to confirm)
L5	Dymond Place / Moretti Retreat / Shaw Mews – 220m of footpath from Riley Park to Sloan Drive (on east side Dymond, north side Moretti and west side Shaw) – liaise with residents to confirm sides
L6	Djilba View, Werloo Court and Bilya Gardens – 300m of footpath from Rogan Park to Djilba Reserve (on north side)
L7	Whitebread Way – 250m of footpath from Rogan Park to existing path (on west / south side)
L8	Proctor Gardens – 160m of footpath from Rogan Park to Whitebread Way (liaise with residents to determine the side)
L9	Bilya Gardens – 350m of footpath from Rogan Park to Dalrymple Drive (on west side, include crossings of all legs of Dalrymple roundabout to access Gabor Park)
L10	Whyatt Green / McNairn Cross / Kooden View / Fitzsimmonds Place – 400m of footpath from Gabor Park to Dalrymple Drive south (on east side)
L11	Yeovil Way – 70m of footpath from Dalrymple Drive south to Runnymede Gate Gabor Park to Dalrymple Drive south (on west side)
L11	Djilba View – 50m of footpath from Dalrymple Drive to Reserve footpath (on east side)
L12	Sloan Drive – 1km of footpath on east side and north side (Wellard Road to Gilmore Avenue)
L13	Robbins Retreat – 180m footpath on east side (Riley Place to Riley Park
L14	Shaw Mews – 170m of footpath on east side (Riley Park to Moretti Retreat) – liaise with residents to confirm side and necessity of path
L15	Taylor Close – 400m of footpath on east and south side (Riley Place to pedestrian access way to Judges Gardens – liaise with residents to confirm side and necessity of path
L16	Judges Gardens – 400m of footpath on south and west side (Shaw Mews to pedestrian access way to Taylor Close) – liaise with residents to confirm side and necessity of path
L17	Safe Active Streets – design and construction of 1.5km of treatments incl. 30km/h speeds on Porter Gardens, Bilya Gardens, McNairn Cross, Yeovil Way
L18	Henley Reserve – 1km hard surfacing of trail to create north-south shared path (2.5m) from Wellard Road to Runnymede Gate (sections in Djilba Reserve already footpath and no change recommended)

1.4.3 Kwinana City Centre (incl. Calista)

Table 1.12: Kwinana City Centre – implementation plan

Priority	Project
KC1	Study of Chisham Avenue to improve crossing permeability between Robbos to Peel with consideration of Gilmore to Meares
KC2	Study of Gilmore Avenue crossing between Sulphur and permeability to Adventure Park, Darius Wells Library, Kwinana Bus Station and Marketplace
KC3	Improve crossing of Meares Avenue and Chisham Avenue roundabout for students to access Gilmore College with raised treatments (potential to incorporate with KC1 above)
KC4	Remove guardrail at Robbos Way and Darius Drive to allow for crossing movements
KC5	Chilcott Street and Bright Street – 270m shared path (2.5m wide) Gilmore Avenue to Isaac Way (south / west side)

1.4.4 Parmelia

Table 1.13: Parmelia neighbourhood – implementation plan

Priority	Project
P1	Meares / Sulphur intersection (extend shared path 30m to connect to cycle lanes on east side of Meares Avenue)
P2	Parmelia Avenue – 220m shared path (2.5m wide) from Tunnicliffe St to northern entrance to St Vincent's school (east side)
P3	Parmelia Avenue – 300m shared path (2.5m wide) from The Ramble to Tuart Ridge (east side)
P4	Sicklemore Road – 850m shared path upgrade (2.5m wide)
P5	Skottowe Park – 30m footpath to connect to Skottowe Parkway
P6	Parmelia Avenue – 1.2km shared path (2.5m wide) from Challenger Avenue to Chisham Avenue (east side) to connect to secondary route
P7	Tunnicliffe Street – widen footpath around power pole

1.4.5 Wellard – Homestead Ridge

Table 1.14: Homestead Ridge implementation plan

Priority	Project
HR1	Wellard Road, Wellard – 1.6km shared path (2.5m wide) from Wellard Oval car park to Millar Road (western side)
HR2	Silversmith Street – 550m of footpath from Wellard Road to Homestead Drive (liaise with residents to confirm demand and determine the side)
HR3	Stonemason Rise – 230m of footpath from Silvermith Street to pedestrian accessway to Mason Mews (liaise with residents to confirm demand and determine the side)
HR4	Connection from path network behind Mason Mews to path network in Wellard Park – 120km footpath (liaise with residents to confirm demand)
	Total 1.6km shared path; 900m footpath

1.4.6 Wellard – The Village / Providence / Emerald Park

Table 1.15: Wellard implementation plan

Priority	Project
W1	Bicycle parking on The Strand – install 2 U-rails in front of Woolworths, one U-rail in front of Bliss & Momos Café, one U-rail at Wellard Square entrance (liaise with shop owners regarding location)
W2	Bicycle parking in Abingdon Park – one U-rail at playground equipment
W3	Mortimer Road, Wellard – 400m shared path from Johnson Road to Kwinana Freeway (south side))
W4	Study of cycling and walking access to new Wellard Primary school
	Total 400m shared path

1.4.7 Orelia

Table 1.16: Orelia implementation plan

Priority	Project
O1	Orelia Avenue – resurface 850m cycle lanes from Thomas Road to Christmas Avenue
O2	Orelia Shopping Centre bicycle parking
O3	Langridge Crescent – 150m footpath from Butt Place to Littlemore Road (south side)

1.4.8 Infrastructure Summary

Table 1.17: Distances – implementation plan

Project	Bertram	Medina	Leda	City Centre	Parmelia / Orelia	Homestead Ridge	Wellard	Total
Shared Path (2.5m wide)	480m	-	1,000m	270m	4,550m	1,600m	400m	**8.3km**
Footpath (1.8-2m wide)	2,100m	830m	4,600m	-	30m	900m	150m	**8.6km**
Safe Active Street	550m	3,500m	1,500m	-	1,900m	-	-	**7.5km**
Bi-directional lane	-	-	-	-	1,750m	-	-	**1.7km**
Bicycle lane	-	-	-	-	1,210m	-	-	**1.2km**
Total	**3.1km**	**4.3km**	**7.1km**	**0.3km**	**9.4km**	**2.5km**	**0.6km**	**27.3km**

1.5 Recommendation Summary

A list of recommendations of the Bike and Walk Plan are provided in Table 1.18.

Table 1.18: Recommendations for Kwinana Bike and Walk Plan

	Recommendations
1	Local route planning to be prepared for Parmelia, Wellard and Orelia.
2	Liaise with Department of Transport about long-term priority to construct shared path on east side of freeway at local standard (3m wide)
3	Liaise with Department of Transport about provision of a Principal Shared Path (PSP) on the freight route for the long-term regional cycling network
4	Implement Kwinana Train Station to Kwinana Town Centre secondary route in the implementation plan
5	Implement Kwinana Train Station to Rockingham Train Station secondary route in the implementation plan subject to Department of Transport funding (City of Kwinana section)
6	Prepare a separate Footpath and Cycling Plan for the industrial areas of Kwinana
7	Implement all neighbourhood plans
8	Ensure all new developments are built to incorporate the local and secondary networks, and connect to Cockburn's network
9	Develop an active transport behaviour change policy and strategy. And work with DoT to implement a 'Your Move Kwinana' program
10	Investigate the feasibility and routing options for potential cycle or walking tours
11	Undertake annual crash investigation study for key hotspot cycle pedestrian crash areas to understand causality, making cycling/pedestrian safer
12	Develop a counting and monitoring strategy for cyclist and pedestrians
13	Work with the South West Group to investigate an E-Bike Route
14	Implement Behaviour Change Initiatives and Way Finding Signage Strategy including around Railway Stations
15	Coloured surfacing for on-road cycling. Providing Green at conflict points as a minimum. Use the cycle symbol pavement marking on all on-road routes.

2. Introduction

The City of Kwinana (the City) aims to create communities where cycling and walking are an integral part of daily life for all types of trips enabling people to lead healthier lifestyles and stay more active and independent for longer. Cycling and walking can also reduce travel costs for individuals.

The City of Kwinana *Bike and Walk Plan* (plan) has been developed with input from the local community and the Department of Transport, so that it meets the needs of the local community. It updates and improves upon the Kwinana Bike Plan prepared by the City in 2010.

The plan provides a clear aim for the provision of cycling and walking facilities within the City, incorporating current standards for the design and implementation of cycling and walking infrastructure to accommodate and encourage active travel behaviours. To assist with this, a socio-economic study has been undertaken to identify the key areas where active transport needs to be promoted within the City allowing infrastructure and travel behaviour change programs to have a more focused approach.

The initial implementation plan concentrates on achieving a network of cycle and walking paths around schools, train stations and shopping centres. The intent is to provide a cycle network for the daily short distance cycling needs of the local community as well as identifying key infrastructure to improve the walking environment so that active transport can be a part of daily life. The plan also integrates with the greater Perth area coordinating the Perth and Peel @3.5 million Transport Plan cycling network for longer distance commuter and sport riders.

The City foresees that providing facilities for safe and convenient cycling and walking can be a catalyst for creating a community that is healthy and active and uses active travel for short to medium journeys.

The main functions of the plan include:

- Evaluating the existing cycling network in the City;
- Identifying local opportunities to integrate cycling and walking into daily life;
- Consulting with key stakeholders (State Government and local community);
- Planning the expansion of the cycling and walking network;
- Encouraging and promoting cycling and walking;
- Developing an action schedule of works for attaining improvements to the cycling and walking network focused on individual neighbourhoods; and
- Developing a longer-term active travel network for the continued development and promotion of cycling and walking.

2.1 Why do we Need to Encourage People to Become More Active?

The City of Kwinana *Bike and Walk Plan* is part of the City's coordinated approach to addressing the physical, social, cultural and economic factors that impact on the local community's health and wellbeing. The City's *Strategic Community Plan (2017 – 2027)* and its *Healthy Lifestyle Plan (2015 – 2018)* also aim to ensure that a broad range of local residents can benefit from leading a healthier lifestyle.

The promotion of active transport provides many benefits for individuals, the community, the economy and the environment. The main benefits of a connected and integrated cycle and pedestrian network can be surmised and categorised for both the individual (local community) and for the wider community. As depicted in Figure 2.1, there are a range of benefits to be gained from cycling and walking for daily journeys. However, not all of these are significant in an outer urban area such as the City. For example, one of the commonly promoted benefits of cycling in inner urban areas is reducing traffic congestion and the need for parking, however, this is not a major issue in the City presently.

Health and Wellbeing

Information provided by the City stated that residents within the City have the highest rate of Type II diabetes and the highest rate of cholesterol in Western Australia.

Providing pathways and facilities for cycling and walking, combined with a program to encourage the use of these facilities, can help to improve the health and wellbeing of the community.

The importance of having a network of cycle routes and footpaths in place to enable healthy living is recognised in the City of Kwinana's *Strategic Community Plan* (2017 – 2027) which aims to implement a safe and efficient integrated network of footpaths and cycle routes.

Save time and money

Cycling and walking are low cost forms of travel which combine necessary daily journeys with daily exercise thus combining two activities into one and saving money on travel.

Cycling also enables young people to independently travel around their community without having to be chauffeured by a parent.

Improved accessibility for more people

A network for cycling and walking allows young people and others without access to a car to move around the community safely and conveniently and be more independent.

The City has seen a change in its demographics and employment and a growth in population. The population of Kwinana is set to double in the next ten to fifteen years with population growth being fuelled by available land for housing development, affordable housing and increased accessibility to Perth City via the Kwinana Freeway and southern railway, with stations at Kwinana and Wellard. There remains great potential for an attractive walking and cycling environment, utilising the Indian Ocean coastline and proximity to the Principal Shared Path (PSP) network along the Kwinana Freeway. As well as its close links to the neighbouring authorities, where use of the lakes networks (running north-south through the south-western metropolitan area) and wider semi-rural areas allow for a great recreational cycle and walking potential.

Figure 2.1: How does Cycling and Walking benefit you and the community?

How does Cycling and Walking benefit you and the community?

Individual Benefits

- ✓ Convenient door to door access without parking hassles in busy urban areas
- ✓ Improved mental and physical health and fitness – evidence suggests that the health benefits of cycling outweigh the associated risks
- ✓ Increased independence, particularly for school children
- ✓ Access to a vehicle which is much cheaper to own and operate than a car
- ✓ Increased opportunities to observe, experience and enjoy the scenery and environment

Transportation System Benefits

- ✓ Cycling can reduce the number of trips made by cars, thereby reducing congestion and freeing up road space for essential motor vehicle trips
- ✓ Cycling can reduce costs for construction and maintenance of roads
- ✓ Cycling can reduce costs for provision of parking facilities
- ✓ Cycles can move large numbers of people relatively quickly and conveniently over moderate distances
- ✓ Cycling can be combined with public transport, making both cycling and public transport more accessible

Community Benefits

- ✓ Greater social interaction amongst neighbours is likely to occur
- ✓ Personal security and crime prevention are enhanced with more "eyes on the street"
- ✓ Provision of improved facilities for cyclists can also improve the amenities available to local residents for walking (such as paths through parks)
- ✓ Provision of cycling facilities can reduce traffic speeds and volumes in urban areas, improving the quality of life in our City
- ✓ Cycling can reduce the amount of space we devote to roads and car parking thereby enabling the enhancement of the urban amenity
- ✓ Provision of cycling facilities promotes civic pride

Health Benefits

- ✓ Healthy weight and physical activity are major contributors to good health
- ✓ Poor diet and inactivity directly contribute to chronic diseases including cardiovascular disease, diabetes and cancer
- ✓ Access to good cycling and pedestrian networks supports a more active population

Economic

- ✓ Cycling is relatively low cost for the initial purchase and to operate
- ✓ Walking is Free
- ✓ Providing opportunities for people to cycle and walk for their everyday transport needs does not impose on them the economic burden of having to use a motorised transportation or pay for public transport
- ✓ Cycling and walking reduces road congestion and associated costs caused by delays
- ✓ Cycling and walking encourages local shopping
- ✓ Peak Oil will impact on the availability and price of fuel, further highlighting cycling and walking as attractive and cost effective modes of transport

Urban Lifestyle

- ✓ Cycling is a mode of transport that takes up little space, is very flexible and enables riders to converse with each other and passers-by
- ✓ Cycling is social and contributes to improved residential amenity
- ✓ Cycling does not threaten the lives of pedestrians, pets or wildlife to the same extent as motor vehicles
- ✓ Cycling is generally unrestricted by age or competence, enjoyable and fun

Environment

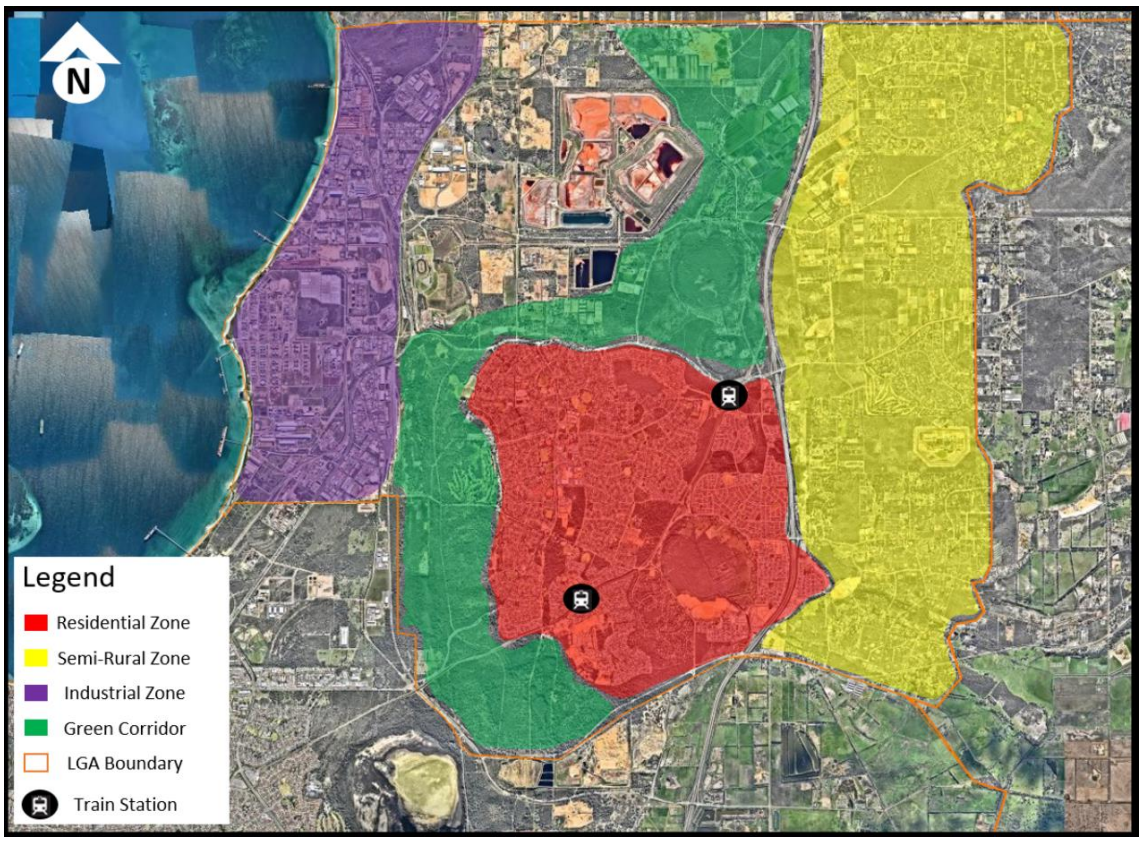
- ✓ Cycling and walking emits no greenhouse gas or other pollutants. Cycling and walking trips can replace short car trips, which are the most polluting
- ✓ Cycling trips can replace public transport trips, freeing up space for others on public transport
- ✓ While walking forms a part of all transport trips across all modes and should be the highest priority mode, connected and safe cycling network designed around the user's requirements has a greater potential to replace driving trips
- ✓ Increasing the amount of cycling and walking is highest priority action that the Council can take to improve transport sustainability
- ✓ Cycling and walking reduces the need for vehicle parking spaces and frees up roads for alternative uses. As well as allows existing parking spaces to be converted to cycle parking – 'One Car Park Space can allow for XXX cycles to park'

Road Safety

- ✓ Cycling and walking has less of a local road safety threat to other road users, compared to motor vehicles
- ✓ Converting driving trips to cycling and walking trips will improve road safety outcomes
- ✓ Studies world wide[1] have shown that the higher the bicycle use, the safer it is for cyclists. This is due in part to: higher bicycle use leading to modified road user conduct as cyclists are more dominant and more drivers are also cyclists with a greater appreciation and respect for other road users, higher bicycle use leads to less car use and lower potential conflicts, and higher bicycle use creates more support so more is invested in a safer bicycling infrastructure

1 "Cycling in the Netherlands" – Ministerie van Verkeer en Waterstaat

Figure 2.2: Identified Land Use within the City of Kwinana



The previous *Bike Plan (2010)* proposed several recommendations which Council has since implemented, including constructing missing links and the installation of signs and pavement markings.

More recently, substantial progress made in bicycle route planning at a state level as shown in the development of the *Western Australian Bicycle Network Plan (2017)*.

The Disability Services Commission reports that in 2003 there were 4,390 people with a disability living in Kwinana, with a total of 20.6 % of the Western Australian population with a disability[3]. Disability Services Commission projected that as the population of Western Australia increases and ages this will be reflected in the number of people with a disability.

The City of Kwinana has experienced significant growth from the period 2003 to 2012; the City now has close to 40,000 residents and is projected to have a population of 84,000 by 2036. It is expected that there will be an increase in the number of people with a disability living in the City as a result of population growth, the aging of the current population and those who take up residency in the City.

A key issue for the City of Kwinana is that 7 out of 10 people within the City are overweight or obese, and 3 out of 5 people are not active enough. Due to these issues, Kwinana has the highest rate of Type II diabetes, cholesterol and behavioural problems in Australia (Curtin University, 2015).

[3] Disability Services Commission, 2003. *Profile of Disability: Perth Statistical Division City of Kwinana*

A measure to combat this, as noted within the *Healthy Lifestyle Kwinana Plan (2015-2018)*, is a **safe and efficient integrated network of roads, footpaths and cycle routes** supported by a good public transport system.

Income levels for the population of Kwinana indicate that there are a higher percentage of people within the low, medium to low, and medium to high category than for greater Perth, with a lower percentage of people within the high category when compared to greater Perth.

The new *Bike and Walk Plan* seeks to provide a clear strategic direction for the development of cycling and walking in City of Kwinana to assist in reducing obesity levels, creating a healthier and more active population. To assist with this, a socio-economic study has been undertaken to identify the key areas where active transport needs to be promoted within the City, allowing infrastructure and travel behaviour change programs to have a more focused approach. The new plan addresses new priorities and incorporates contemporary best practice for the continued design and implementation of bicycle infrastructure, as well as a pedestrian network across the City to accommodate and encourage active travel behaviours. While the plan will work towards providing for a broad range of potential users, those between 8 to 80, the focus of the plan will be on the lower socio-economic areas and ensuring the right infrastructure is proposed.

As a tool, the network plan will contribute to the development of a safe, connected and attractive cycling network, available for all, and providing not only a viable alternative transport mode, but also recreational, tourism and health opportunities for the community.

Both cycling and walking have the potential to become an integral part of the transport network. Walking is an integral part of every mode of travel and cycling is not just for the dedicated "cyclist" commuters, but for everyday "bike riders", who can travel short distances to destinations, or, as part of multimodal transportation with public transport.

3. The City's Active Travel Vision

As noted previously, the plan provides a clear strategy for the design and implementation of cycling and walking infrastructure across the City to accommodate and encourage active travel behaviours by ensuring the right infrastructure is proposed within each neighbourhood within the City. The focus of the plan is to encourage 1-2km trips to destinations frequently visited to improve the health and well being of the community.

In this regard, the Vision and Objectives are as follows.

Vision

Develop a safe, connected and attractive cycling and walking network so that active travel becomes an integrated part of daily life for all types of trips, enabling people to lead healthier lifestyles and stay more active and independent for longer.

Objectives

- To have an interconnected continuous and well-maintained bicycle and pedestrian network that cyclists and pedestrians of all abilities feel comfortable using;
- To be a city where walking and cycling is the first choice for transport (for all ages) for short trips (1 - 2 km);
- To have a network of safe roads designed to Safe Active Street principles to encourage the short trip journeys;
- To improve the City's health issues by actively promoting new cycle and walking infrastructure as it is implemented; and
- To improve walking and cycle access to schools, train stations, parks and recreational facilities.

Key Initiatives

The following key initiatives together will work toward achieving the proposed objectives.

- Plan and deliver a connected network of slow speed, safe cycle and walking routes that achieves:
  - A safer route to schools' program;
  - improved access to stations; and
  - connects people to shops and community facilities.
- On-street bicycle parking to be increased as well as more trip end and during trip facilities;
- The City to assess the possibility of bicycle maintenance stations at key locations within the City;
- Working to reduce the number of cyclists or pedestrians killed or seriously injured within the City through improved crossing facilities and protected on and off-road cycle infrastructure;
- The City to assess the possibility of a local planning policy that requires all developers to provide a travel plan for their development;
- Increase awareness of the principles of the Strategy within Council to assist in education of the wider community; and
- Increase awareness of the principles of this *Bike and Walk Plan* within Council to assist in education of the wider community.

3.1 Process Engaged

GTA undertook the following activities to design the long-term network and implementation plan in conjunction with the City's project coordination team.

- Documentation review, evaluation of data relating to demographics, user counts, crashes, Census information, STRAVA heat maps, Super Tuesday count data, Main Roads crash data etc.
- Socio-economic study prepared by Hames Sharley (engaged as sub-consultant for the project).
- Consultation with the local community through on-line platform *CrowdSpot* to reveal deficiencies.
- Consultation with Department of Transport, Main Roads WA, adjacent local government authorities and relevant stakeholder groups to agree on the secondary network and approach of the cycling and walking plan.
- Preparation of a cycle route network plan based on the draft cycling network of the State Government's Perth and Peel @3.5 Million Transport Plan (PPTP), a desktop study and a saddle survey.
- Consultation with City of Kwinana regarding its cycle network and agreement on the approach to focus on routes to improve health, as well as the neighbourhood plan approach.
- Detailed analysis of the specific neighbourhoods to determine the long-term network plan and implementation plan associated with each individual area.
- Consultation with the City of Kwinana regarding project prioritisation.
- Submission of the draft report for review then finalisation of the cycling and walking plan for Council endorsement.

3.2 Literature Review

3.2.1 Strategic Guidance

To inform the *Bike and Walk Plan* and ensure its vision and objectives align with other City of Kwinana policy's and strategy's as well as state and national government cycling policies and strategies, a review of key documentation has been undertaken, and is presented in Appendix A.

The review of each level of government strategic documents (Local, State and National) is summarised below.

3.2.2 City of Kwinana Strategic Document Review Summary

The various local government reports have a common theme with each one noting the requirement for the City to provide a **connected** and **safe** network for cyclists and pedestrians. As well as planning for active travel and ensuring provision of cycling and walking infrastructure is allowed for in newly developed areas. The *Town Centre Masterplan* notes a number of corridors identified for cycling and walking priority.

3.2.3 Western Australia Strategic Document Review Summary

The common theme through the documents released by State Government is the importance of encouraging cycling and waking to build a more active and healthy community, specifically identifying **connections to schools** and **stations** and providing the right infrastructure for the right end user. The PPTP has identified various road proposals as well as new cycle links that have been considered as part of the long-term network. The WABN notes specific infrastructure actions to which the Kwinana *Bike and Walk Plan* will respond to.

3.2.4 National Strategic Document Review Summary

Federally released documents require state and local governments to improve accessibility within their jurisdiction in order to **reduce the dependence on private motor vehicles** and reduce social isolation. The **active transport networks should be continuous, convenient and connected** providing a **safe** environment for pedestrians and cyclists.

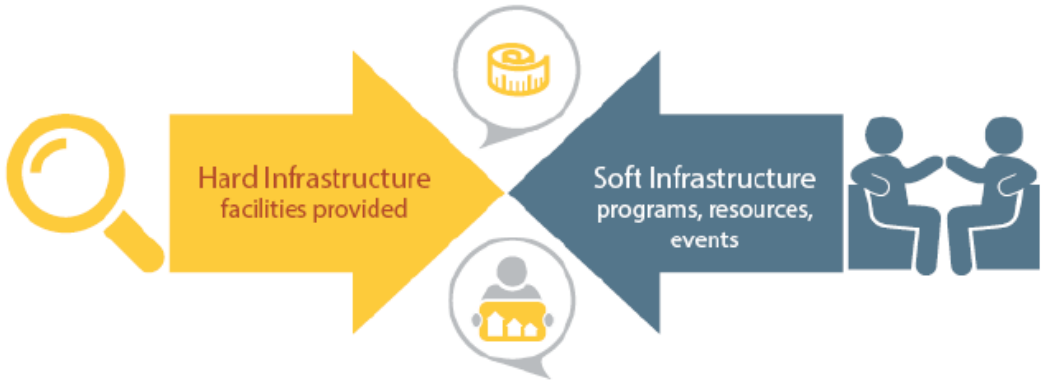
4. Socio-Economic Study

To aid the understanding of the City of Kwinana's Socio-Economic and Health issues a Socio-Economic Study has been undertaken. The Socio-Economic Report is provided in full in Appendix B. A summary of the process undertaken, and the key findings are presented below.

4.1 Social Infrastructure Review Process

Following the review of a community's social infrastructure, it is important to understand the requirement for both 'hard' and 'soft' elements. 'Hard' elements include health facilities and centres, education facilities, art and cultural facilities, recreational grounds and connections between. Ensuring good quality design outcomes within these elements is important for maximising the potential benefits to the community and value for money outcomes. As found within the review of major infrastructure, Kwinana has a good supply of facilities accommodating a range of activities and services. However, there is a gap in understanding of how well connected and well used these facilities are in terms of the 'soft' programming and the quality of design to suit their purpose.

Figure 4.1: Social Infrastructure as both hard and soft elements



'Soft' elements may include programs, resources and services, as well as public art and cultural events that complement 'hard' elements and contribute to the formation of community. 'Hard' elements do not work successfully unless 'soft' elements accompany them. Public and private investment in social infrastructure is essential to build the social capital and fabric of the community. This enables active living, learning opportunities, social interactions and supporting programs that help people innovate, express themselves and adapt to major life events. It is social capital that makes the community liveable, inclusive, competitive and diverse (WAPC, State Planning Strategy 2050). In this regard, a detailed Social Services Review for Kwinana is a priority to understand the alignment of 'hard' and 'soft' elements, and where the future needs and provisions will be to provide for its social infrastructure.

No two places are the same and therefore there is no single blueprint for creating liveable, inclusive, competitive and diverse communities; it arises from an understanding of context and place. Often this is best delivered by outcome-based policy rather than by traditional planning models that focus on hard rather than soft infrastructure outcomes. An outcomes-based approach requires those designing and assessing strategies and proposals to have a holistic understanding of community wellbeing and place-making. Spaces and places are public areas which reflect the community needs, purpose and identity. Collaboration with the Kwinana

community and the application of an appropriate response and design outcomes will be essential to the future prosperity of the City.

RECOMMENDATION 1: Undertake a detailed Social Services Review for Kwinana to understand where future needs and provision will be for social infrastructure

4.2 Social and Economic Initiatives

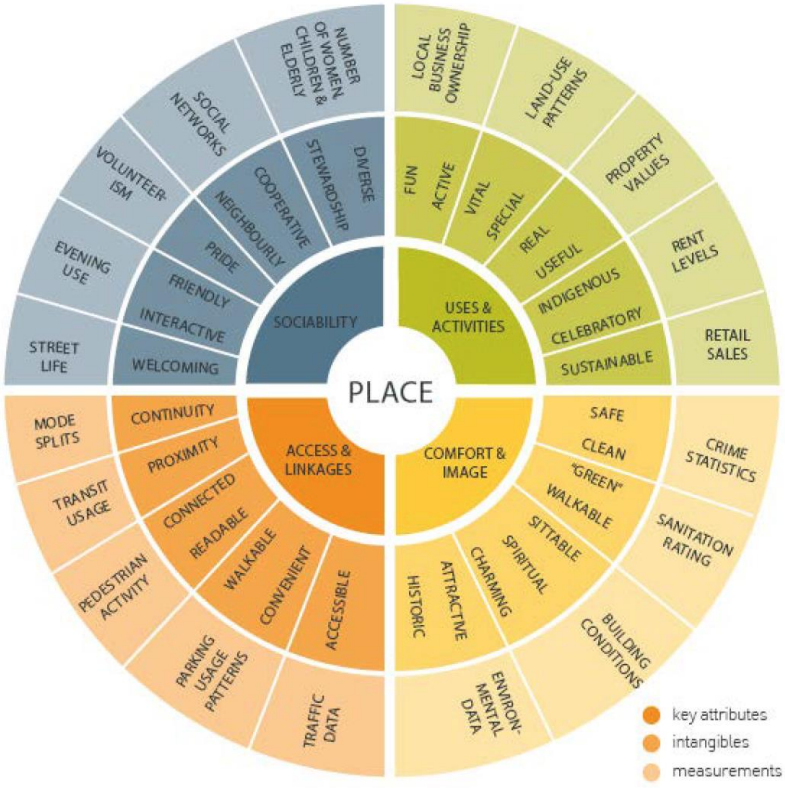
This review is an overview or spotlight on health and liveability issues in Kwinana. As such, it has been framed around liveability themes and initiatives that respond broadly to the overarching place-based lens.

4.2.1 Measuring liveability: The Place Lens

Measuring liveability can be very challenging as people look for and value different things when searching for 'a place to call home'. Liveability is closely linked to place. It is therefore valuable to reference a place lens that considers both the intangible qualities of place and the measurable quantitative aspects to enable a more comprehensive assessment of the success of a place as a liveable community. This is depicted in Figure 4.2.

Capturing data for both the quantitative and qualitative aspects of liveability and place will enable the success of Kwinana as a place to live to be more clearly measured. This in turn will provide justification for future funding and service provision.

Figure 4.2: Place Lens



Source: Projects for Public Spaces, www.pps.org, 2016

There are many initiatives and programmes already in place across government agencies and other responsible parties that are aimed at improving liveability in Kwinana. The initiatives

emerging from this review are those which came into sharper focus through both the liveability indicators and a review of recent community consultation. The 'spotlight' nature of the project and short timeframe has constrained the ability to refine, deepen and articulate implications of findings. As such, further work is recommended to confirm the initiatives proposed.

In proposing the initiatives there has been a focus on:

- **Diversity –** Linking local destinations to positively influence neighbourhood walkability and encourages residents to enjoy physical activity and social connections.
- **Access –** Ensuring a selection of destinations within walkable distance from households facilitates active transport, such as walking, cycling or use of public transport as more viable and makes it easier to reduce car use.
- **Design -** The design of the public realm is important in determining how people reach the destination, how they move and interact with it. as well as how it can enable a strong connection to the community and the environment.
- **Connectivity -** Movement can be enhanced through the provision of safe, connected, convenient, continuous, easily navigated and attractive links.
- **Infrastructure -** The inclusion of safe, functional and highly visible infrastructure encourages a range of travel options.
- **Streetscape Design -** Greater movement is encouraged in streets which have been designed to accommodate all transport users.
- **Function -** Open spaces assist in meeting the physical, recreational and social needs of a community.
- **Consultation -** Encouraging both current and future communities to participate in design and development decisions contributes to a sense of place and builds ownership and respect.
- **Composition -** The layout or position of community facilities that enable multiple uses can provide health and socio-economic and economic benefits.
- **Flexibility -** Facilities that can accommodate multiple functions may better serve the community and encourage greater use.
- **Context -** Well-designed buildings can improve health outcomes by engaging with their surrounds.
- **Local Participation -** Combination of hard and soft initiatives with a priority for low capital expenditure and optimum community participation.
- **Choice of Housing –** Ensuring a mix of dwelling types to increase density and attract a broad demographic, creating a resilient neighbourhood that caters for a diverse range of household structures, ages and tenures.

4.3 Priority Actions

The priority actions as presented within the Socio-Economic Study have been categorised into Health Check, Sense of Place, Public Open Space, Movement Networks, Community Facilities and Key Destinations and Housing Diversity and are presented within Table 4.1.

Table 4.1: Socio-Economic Study priority actions

Health Check	
Connectivity	**Access**
The way we design and build our neighbourhoods and communities' affects resident's social connections, sense of community and social capital and thus their levels of physical activity and mental health. ○ Ensure parks and other areas of public open space provide attractive local destinations for people of all ages to walk and cycle to and be active in. ○ **Ensure continuity of access within and through adjacent neighbourhoods, and to the wider networks – particularly in less connected, older neighbourhoods of Calista-Medina, Orelia and Parmelia.** ○ **Promote greater physical activity and community interactions by establishing good access along a defined active transport network of footpaths and cycle ways - connecting the range of uses and destinations such as the Kwinana Recquatic Centre, train station, local schools and surrounding public open spaces** ○ Review opportunities to densify neighbourhoods, particularly Wellard, Leda and Wandi, and offer a diverse mix of co-located destinations (including employment, education, retail and recreational uses) to encourage and sustain active modes of transport.	A selection of destinations that are a walkable distance from home makes active transport, such as walking, cycling or use of public transport more viable. ○ **Ensure community and recreational facilities are well serviced by linked pedestrian and cycle routes, designated crossings, and suitable ramps to encourage regular physical activity and social interaction.** ○ Within developing neighbourhood areas, such as Wellard and Bertram ensure a range of uses that promote physical activity and community interactions. ○ Ensure all community members have access to at least one open space within a 400m - 800m walk – enhancing opportunity for walking and cycling as well as mental health benefits and greater social interaction.

Sense of Place

Personal and Community Safety

The design of the public realm and network of connections are important in determining perceptions of safety, how people reach the destination, as well as how they move and engage within spaces and places.

- Ensure open spaces and supporting infrastructure are well managed and maintained – creating attractive environments and a positive sense of place.
- Review key destination to ensure public spaces encourage activity and interaction across the community.
- Ensure the design of spaces and connections put the pedestrian first and are of a comfortable scale – particularly within the city centre and new local centres.
- Identify opportunities to attract night-time activation, particularly within the city centre – creating vibrant and inviting centres.
- Ensure adequate street lighting and illumination across footpaths, at key entrances to buildings and at bus stops and train stations.

Local Participation

A good sense of place can foster a positive emotional attachment to a neighbourhood and community, levels of interaction between members of the community and formal participation or involvement in neighbourhood and community organisations.

- **Ensure community consultation has been employed to determine infrastructure needs, gaps and desires into the future.**
- Identify opportunities for the community to be engaged and involved in the design of the public realm, civic spaces and public art.
- Ensure design choices have been informed by the cultural identity of the city and local areas - based on the social, economic, environmental and indigenous histories.
- Identify strategies to encourage a diverse mix of destinations integrated in close proximity to residential dwellings – providing greater opportunity to fulfil daily activities and needs (live, work, play) within existing and newer neighbourhoods.

Public Open Space

Function

For children and young families, public spaces and parks provide places to meet and to participate in physical and social play. The provision of public open spaces is thus a key factor in promoting active living and providing important physical, psychological and social health benefits for individuals and the community.

- Consider the roles and functions within public open spaces holistically to resolve needs to cater for a variety of users across the open space network.
- **Enhance pedestrian and cycle linkages to public opens spaces – particularly new attractions such as the Adventure Playground in Calista Park.**

Quality of spaces

Open space designs that respond to their surrounds can enable a strong connection to the community and the environment.

- Ensure public open spaces and linkages offer attractive environments and quality design outcomes – increasing visitation and physical activity levels.
- **Ensure pedestrian and cycle connections most frequently used provide protected and comfortable environments.**
- Ensure public spaces respond to existing environmental conditions such as drainage, slopes and retaining trees where appropriate.
- Ensure new development is designed to contribute to street activation and allow natural surveillance of the surrounding community and public spaces.

Movement Networks	
Infrastructure	**Streetscape Design and Integration**
The inclusion of safe, functional and highly visible infrastructure encourages a range of travel options. ○ **Ensure end of trip facilities, such as bike racks, drinking fountains, change rooms and lockers, shade/ shelter, seating and lighting, are provided within the city, local centres and key destinations.** ○ **Ensure facilities are designed for all users, including the young, the elderly and those with disabilities.** ○ Ensure public transport stops are provided within suitable proximity to dwellings and destinations. ○ **Prioritise walking and cycling as the preferred means of travel within the city centre. Address wait times at traffic lights, the size of footpaths compared to roadway widths and prioritising pedestrian/cycle crossing points.** ○ Modes of transport will continue to evolve over time. Ensure future transport needs are accommodated in new street design.	Streets which have been designed to accommodate all transport users will encourage more movement. Movement is enhanced through the provision of safe, connected, convenient, continuous, easily navigated and attractive links. ○ **Ensure connections to key destinations are well lit, provide clear directions or signage to encourage greater use and accommodate shade and shelter at key stops and destinations.** ○ **Link more than one route between destinations to provide variety in active transport options and experiences.** ○ **Identify opportunities to narrow streets near schools with footpaths becoming wider with crosswalks and pedestrian crossing points connecting movement networks.** ○ **Ensure streets are connected and designed in response to their surrounds – reducing speeds along primary pedestrian and cycle networks, increasing perceptions of safety and comfort.** **Integration** ○ **Ensure pedestrian and cycle networks optimise access and routes to community spaces and key destinations, such as the city and local centres, railway stations and schools.** ○ **Provide continuity and cohesion of walking, cycling and public transport movement networks across adjacent neighbourhoods – particularly for integrating older neighbourhoods of Calista, Orelia and Medina linkages to the city centre and railway station.** ○ Encourage greater density around key centres to increase public transport numbers required for regular service routes. ○ **Ensure good access to regional cycle routes and networks – enabling greater choice of active transport.**

Community Facilities and Key Destinations

Flexibility

Mixed-use planning and the presence of a variety of destinations promotes greater walking and cycling which in turn increases the sense of community or social capital through the facilitation of interaction between residents.

- Within developing areas such as Wellard, ensure community facilities are organised to allow for interim uses while the area is established.
- Review community and recreational facilities to ensure these offer a range of activities that meet the needs of the community.
- Identify the opportunity for facilities to accommodate multiple functions, better servicing the community and encouraging greater use.

Diversity of Users

Social interaction is critical for creating and maintaining community cohesion and building social capital. An interesting choice of local destinations positively influences neighbourhood walkability and encourages residents to enjoy physical activity and social connections.

- **Promote active modes of travel to and from schools – increasing physical levels of activity and fostering perceptions of safety in the area, particularly in the Wellard (west) development of a new school on Johnson Road.**
- Ensure destinations offer a mix of uses that will encourage consistent attendance and use – within walking distance to homes.
- Identify opportunities where usage can be enhanced through the provision of community and cultural facilities, open spaces or sporting activities.
- Address opportunities for creating 'walkable' and sustainable neighbourhoods by offering key destinations such as employment, education, retail and recreation land uses.
- **Design car parking within the City and local centres to reduce unnecessary car travel – with a focus on linking safe, attractive and comfortable pedestrian and cycle pathways as convenient alternatives.**

Housing Diversity

Choice of Housing

A mix of dwelling types can increase density and attract a broad demographic, creating a resilient neighbourhood that caters for a diverse range of household structures, ages and tenures.

- Review policy to ensure new neighbourhoods offer a range of dwelling choices that are suited to the needs and character of the area.
- Identify opportunities within existing neighbourhoods to provide for a diverse community and enable residents to remain within their community across each stage of life.
- Review the strategic locations of affordable housing in close proximity to local amenities such as public transport, employment, shops and schools.

Context

The design of a dwelling can have a positive influence on its surroundings and inhabitants and can lead to safer and more engaged communities and healthier lifestyles.

- Ensure new dwellings are designed to engage with the street and/or adjacent open space.
- Provide guidance for dwellings to provide passive surveillance by locating active spaces such as living areas and balconies overlooking streets and open spaces.
- Identify opportunities for new dwellings sited on the lot to allow for future intensification.

5. What Is The Data Telling Us?

5.1 Kwinana Census

The method of travel to work is recorded in each census. Table 5.1 shows the preferred mode of travel people make within the City of Kwinana area.

Table 5.1: Travel to work modes in City of Kwinana

Method of travel to work

export reset

City of Kwinana - Employed persons (Enumerated)	2011			2006			Change
Main method of travel	Number	%	Greater Perth %	Number	%	Greater Perth %	2006 to 2011
Train	1,109	9.0	6.7	37	0.4	4.1	+1,072
Bus	213	1.7	3.7	375	4.1	4.1	-162
Tram or Ferry	0	0.0	0.0	4	0.0	0.0	-4
Taxi	10	0.1	0.2	5	0.1	0.2	+5
Car - as driver	7,844	63.4	62.2	6,120	66.5	63.0	+1,724
Car - as passenger	788	6.4	5.3	616	6.7	5.8	+172
Truck	122	1.0	0.8	123	1.3	1.0	-1
Motorbike	83	0.7	0.6	68	0.7	0.6	+15
a Bicycle	22	0.2	1.1	26	0.3	1.0	-4
a Walked only	113	0.9	2.2	111	1.2	2.0	+2
Other	172	1.4	1.5	287	3.1	1.1	-115
a Worked at home	234	1.9	3.5	212	2.3	3.6	+22
Did not go to work	1,448	11.7	10.9	1,031	11.2	11.6	+417
Not stated	218	1.8	1.3	182	2.0	1.7	+36
Total employed persons aged 15+	12,376	100.0	100.0	9,197	100.0	100.0	+3,179

Source: Australian Bureau of Statistics, Census of Population and Housing 2006 and 2011. Compiled and presented by .id , the population experts.

a People who travelled to work by car
a People who travelled to work on public transport

Please refer to the specific data notes for more information

The data presented in Table 5.1 notes that for the Kwinana local government area in 2011, the use of the car was higher than the metropolitan average at 63.4% rising to 69.8% when car passengers are included. However, this is a slight reduction in car use since 2006 reducing by approximately 2% since the 2006 survey. The number of respondents who chose cycling or walking as their travel method (while overall is small in number) has actually decreased between 2006 and 2011.

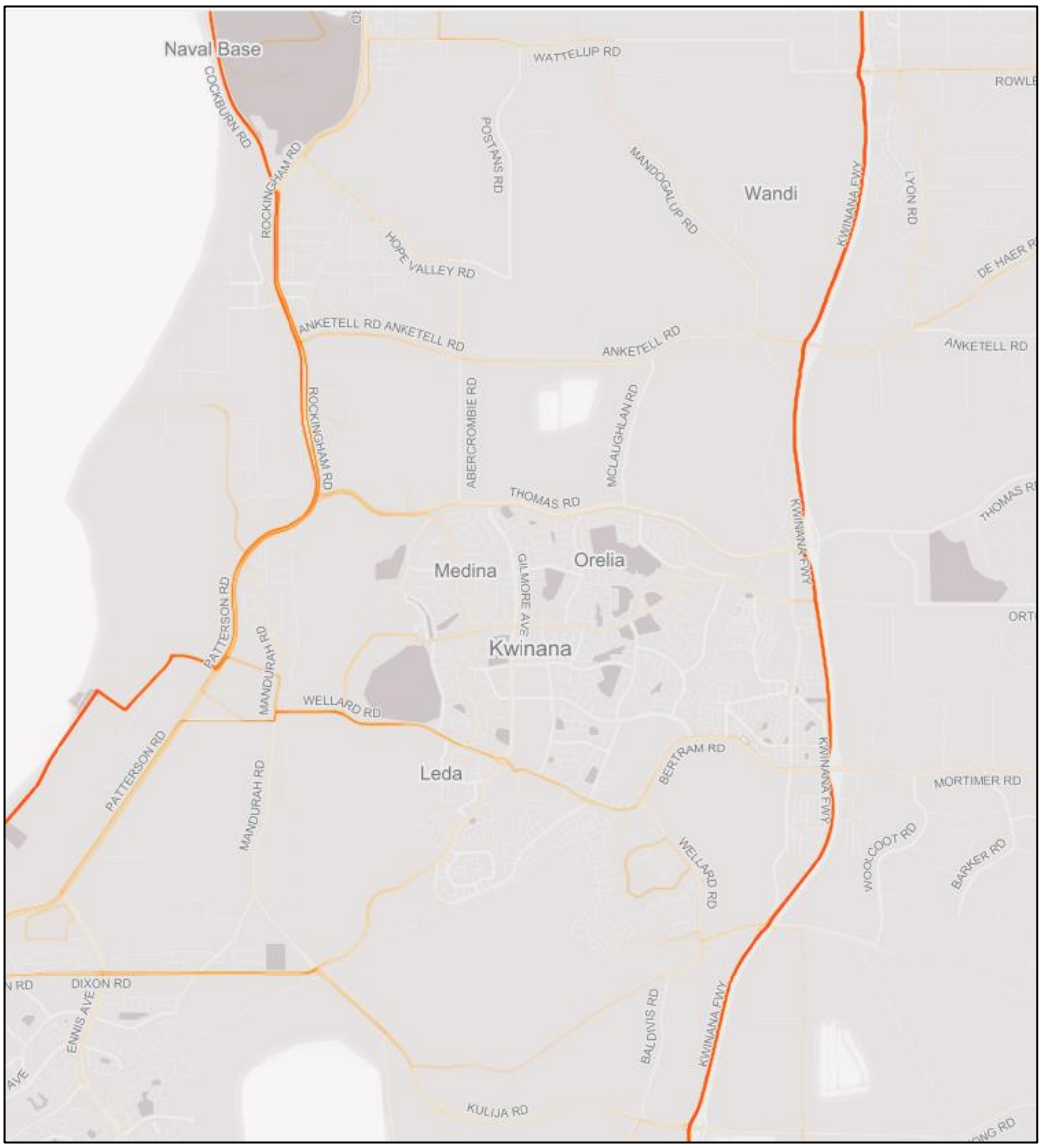
5.2 Where are our existing riders, riding?

Figure 5.1 and Figure 5.2 below illustrates the data collected through the 'STRAVA' application which tracks cycling and walking routes used most frequently by STRAVA users. The data indicates that the highest proportion of cyclists using the STRAVA application occur on the:

- Kwinana Freeway Principal Shared Path; and
- Cockburn Road/Rockingham Road/Patterson Road approaching Kwinana Beach Road to connect to Rockingham via Rockingham Beach Road (this is in lieu of a coastal recreational route).

The data also indicates the Kwinana is frequently accessed more from the west than the east and Wellard Road from the south west is a connection both to Rockingham Beach (via Rockingham Beach Road) and to Patterson Road to the north.

Figure 5.1: Kwinana STRAVA cycling data



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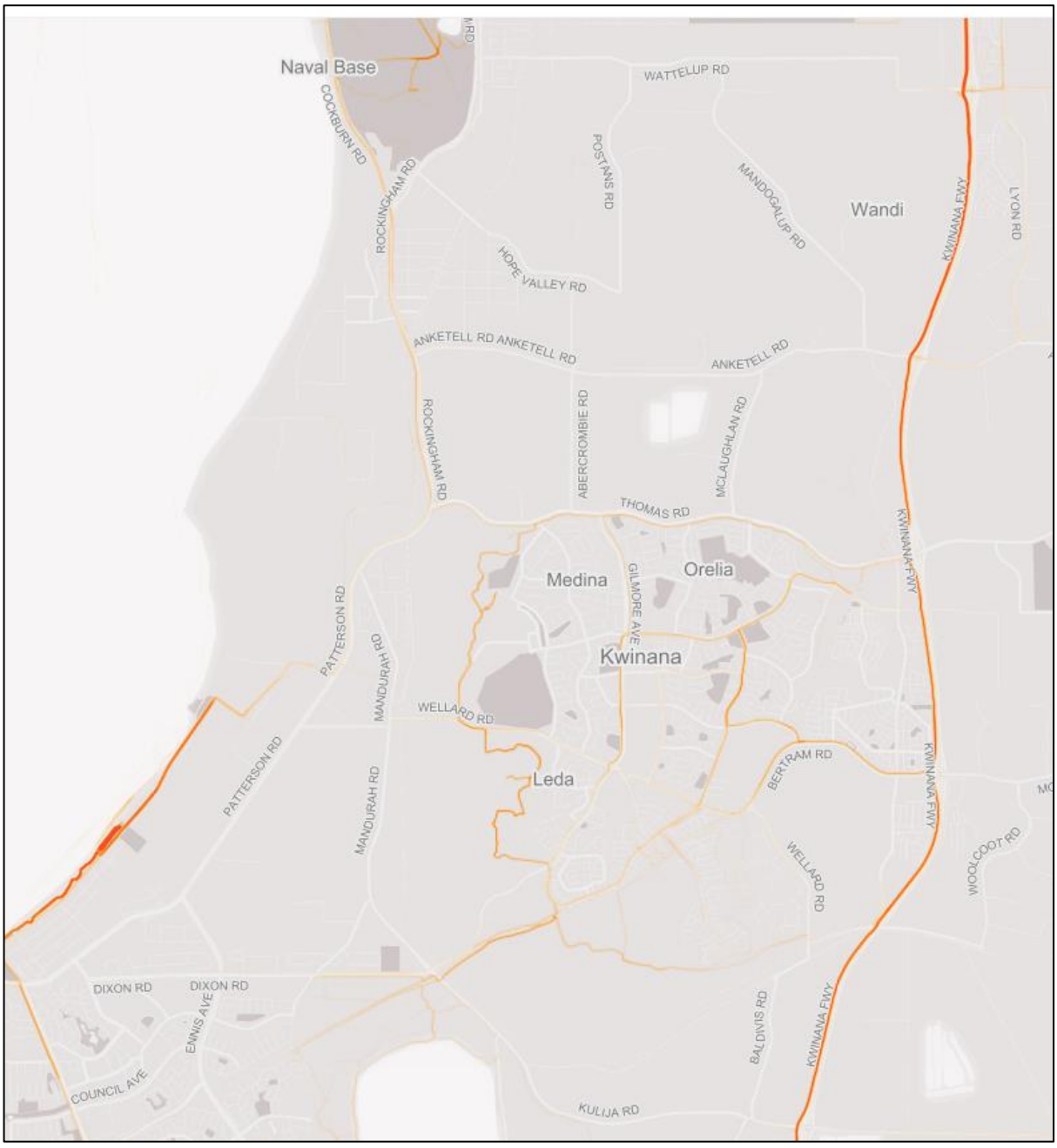
The Kwinana Freeway PSP corridor also experiences a high proportion of people walking. Runners/walkers also tend to be more concentrated around the Kwinana Loop Trail which runs around the Kwinana City Centre.

Figure 5.2: Kwinana STRAVA walking data



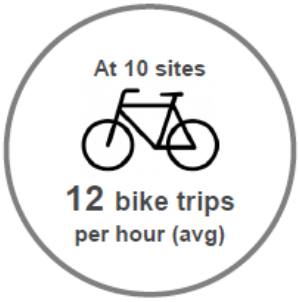
These findings helped to define the cycling network defined in Section 9.

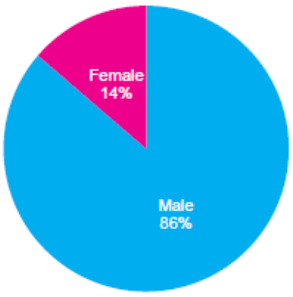
Super Tuesday Bike Count (Super Tuesday) is the world's biggest and longest running visual bike count. It measures bicycle commuter flows in the morning peak from 7am to 9am. The ninth annual Super Tuesday was conducted on Tuesday 3rd March 2015. The results showed a 3% increase compared to the same locations in 2014. The Super Tuesday results for Kwinana are present in Table 5.2.

Table 5.2: Super Tuesday 2015 Kwinana cycle count data

Site ID	Site Description	Total Female	Total Male	Total Unknown	Total 2015	Total 2014	% Change
6055	Freeway PSP [N], Thomas Rd Bridge [E], Freeway PSP [S], Thomas Rd [W]	3	53	0	56	4	1300%
6057	Rockingham Rd [N], Thomas Rd [E], Rockingham Rd [S]	0	5	0	5	11	-55%
6058	Cycle Path [N], Mortimer Rd [E], Underpass [S], Mortimer Rd [W]	5	37	0	42	39	8%
6059	Gilmore Ave [NE], Mandurah Rd [SE], Dixon Rd [SW], Mandurah Rd [NW]	0	5	0	5	10	-50%
6061	Gilmore Ave [NE], Wellard Rd [SE], Gilmore Ave [SW], Wellard Rd [W]	2	14	0	16	9	78%
6064	Rockingham Beach Rd [NE], Rockingham Beach Rd [SW]	3	18	0	21	32	-34%
6067	Hope Valley Rd [E], Cockburn Rd [S], Cockburn Rd [N]	0	5	0	5	3	67%
6073	Thomas Rd [E], Gilmore Ave [S], Thomas Rd [W]	0	2	0	2	5	-60%
6692	Freeway PSP [N], Freeway PSP [S], Rowley Rd [W]	16	50	0	66		
6693	Chiswick Pde [NE], Train Station Entrance [SE], Chiswick Pde [SW], The Strand [NW]	4	19	0	23		

- Super Tuesday Bike Count 2015 showed a 35% annual growth compared to the same locations counted in 2014.
- In 2015, an average of 12 bicycle trips per hour was counted at all 10 intersections in Kwinana during the 7am - 9am morning peak period.
- The busiest site in Kwinana was on the Freeway Principal Shared Path at Rowley Road with 66 bicycle riders. This ranked 28th among 33 participating major cities.
- Female riders represented 14% of bicyclists across the municipality. This is below the average female ridership (23%) of all the surveyed areas.
- The busiest count site in Kwinana was Site no. 6692, Freeway PSP [N], Freeway PSP [S], Rowley Rd [W], where 66 bicycle commuters were recorded during the 2-hour survey. The peak hour was 7:15–8:15 with 41 riders and there were more male riders observed at this intersection.





5.3 How safe is the network?

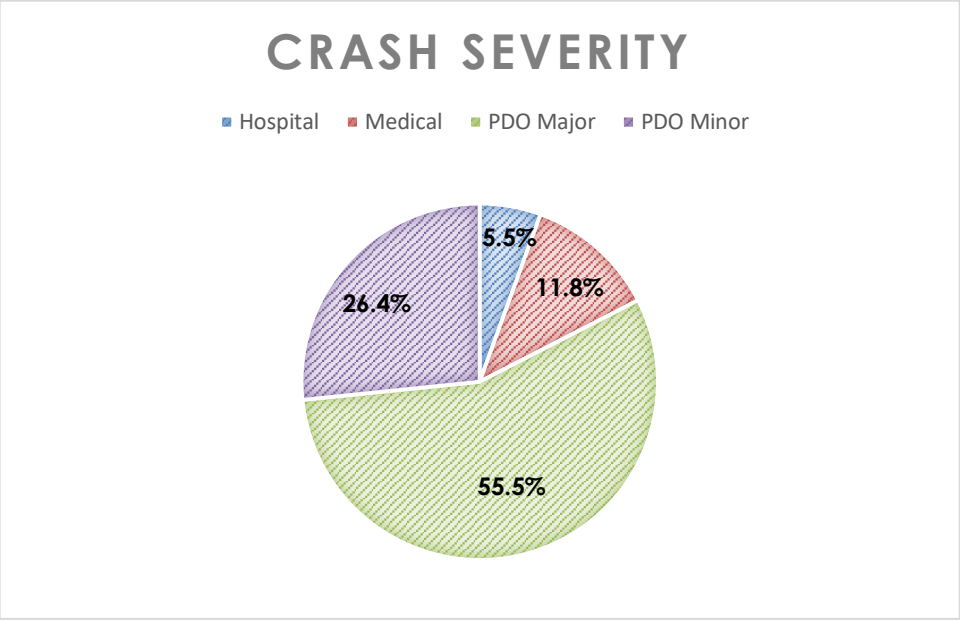
Crash analysis has been undertaken using the latest available crash data (2011 to 2015) from the Main Roads Western Australia Crash Reporting System. There were 2,558 reported crashes within the City between 2011 and 2015 with 10 of these crashes resulting in a fatality (2 of these were pedestrians). A summary of the crash type commonly occurring within the City of Kwinana is presented in Table 5.3.

Table 5.3: City of Kwinana five-year crash data by crash type (2011-2015)

Crash Type	Total Crashes	Percentage
Rear End	1,088	42.5%
Right Angle	446	17.4%
Sideswipe Same Direction	244	9.5%
Right Turn Thru	101	3.9%
Hit Object	426	16.7%
Hit Pedestrian	18	0.7%
Head On	40	1.6%
Non Collision	70	2.7%
Hit Animal	8	0.3%
Other	117	4.6%
Total	**2,558**	**100%**

The assessment of the severity of crashes within the City is presented in Figure 5.3 and notes **that less than 1% of the crashes ended in a fatality** (hence it does not show within Figure 5.3). Over three quarters of the crashes were Property Damage Only (PDO) crashes.

Figure 5.3: Crash severity within City of Kwinana



From the recorded crashes, **only around 1% of crashes involved a pedestrian or cyclist**. Figure 5.4 and Figure 5.5 represent the locations of the pedestrian and cycle crashes respectively.

Figure 5.4: Pedestrian crash locations within City of Kwinana

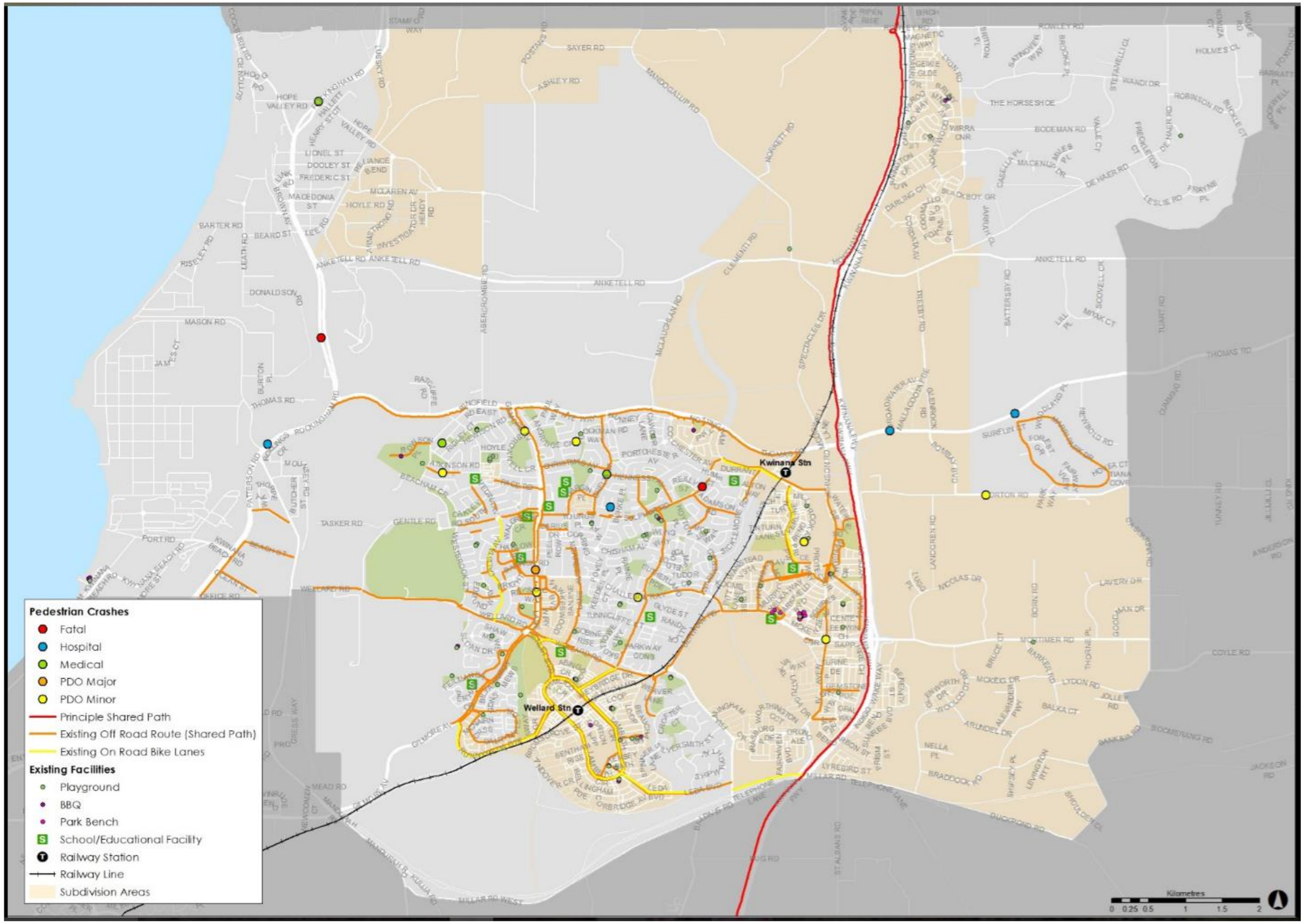


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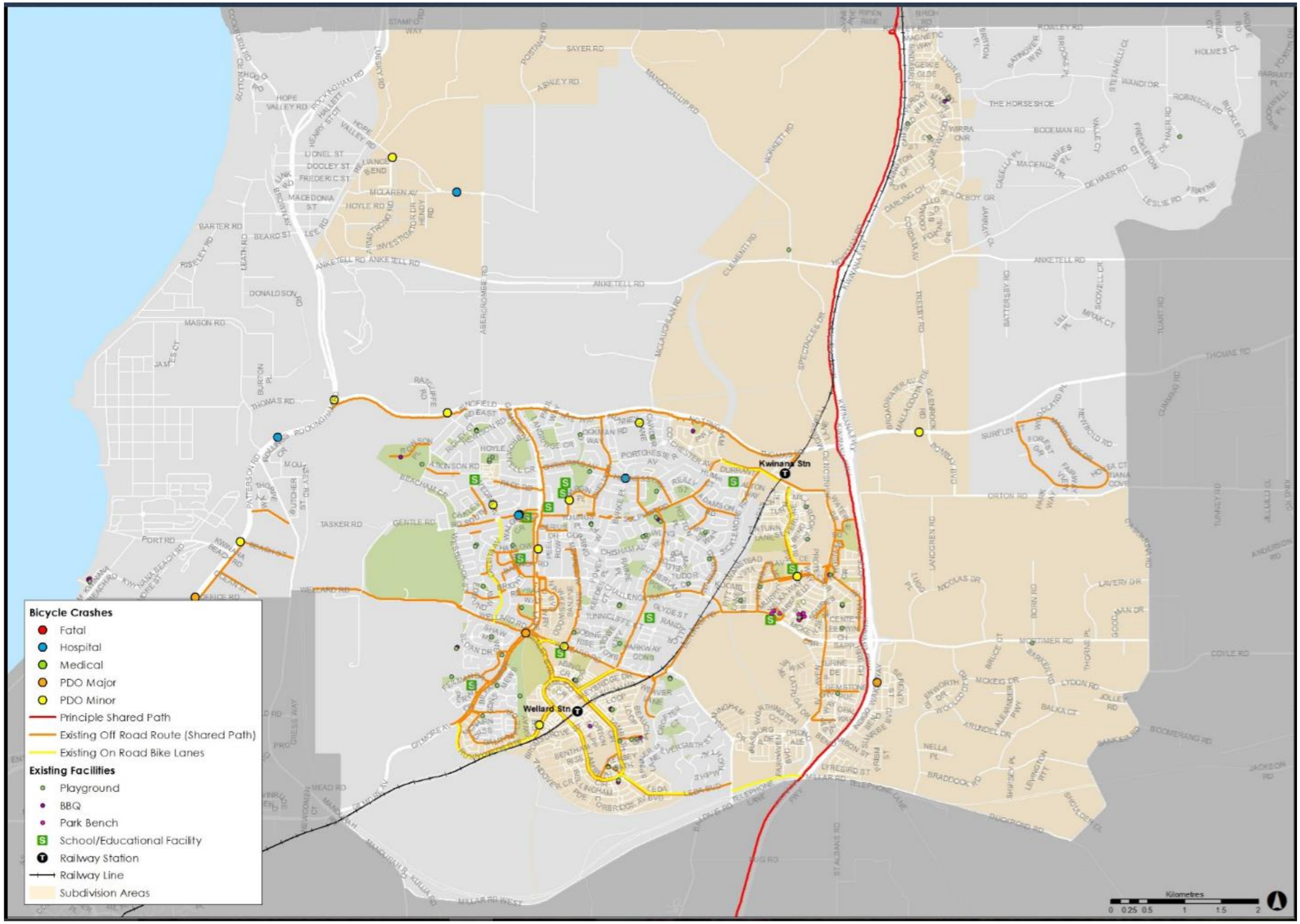
Figure 5.5: Cycle crash locations within City of Kwinana



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Between 2011 and 2015, there were 18 crashes recorded as involving pedestrians within the City of Kwinana area, of these, 2 accidents resulted in a fatality.

Table 5.4: City of Kwinana pedestrian crashes by severity and year

Severity of Crashes Involving Pedestrians					
	2011	2012	2013	2014	2015
Fatality	1	1	0	0	0
Hospital	1	1	2	0	0
Medical	1	0	0	1	1
Property Damage	5	1	1	1	1
Total	**8**	**3**	**3**	**2**	**2**

There was a reduction in crashes involving pedestrians after 2011. While there is no specific pattern of crashes involving pedestrians or clusters of areas where they repeatedly occur, it is noted that two crashes occurred within the Kwinana City Centre and three occurred along Patterson and Rockingham Roads.

Over the five-year period there were 20 recorded crashes within the City involving bicycles, none of these resulted in a fatality.

Table 5.5: City of Kwinana cycle crashes by severity and year

Severity of Crashes Involving Cyclists					
	2011	2012	2013	2014	2015
Fatality	0	0	0	0	0
Hospital	0	1	1	1	1
Medical	0	0	0	0	0
Property Damage	1	3	5	4	3
Total	**1**	**4**	**6**	**5**	**4**

There was a similar number of crashes involving cyclists occurring in each year between 2012 and 2015.

There are several cycle crashes occurring either along Patterson and Thomas Roads, or, at or near to local schools, indicating a potential issue with traffic speeds around school locations.

Data Summary

It is evident from the data that the number of cyclists and pedestrians currently traveling within City of Kwinana is low for overall mode share for transport within the City. Of those that do currently cycle and walk, the predominate routes are the existing shared use facilities that are separated from traffic (such as the freeway PSP) with the predominant cyclist type being commuter or recreational. Cyclist were evident on other roads, such as the on-road/sealed shoulder along Cockburn and Rockingham Roads as well as the existing shared path along a section of Thomas Road, although in lower numbers. Pedestrians were more evident in locations of higher activity land uses such as the Kwinana City Centre, utilising the Kwinana Loop Trail with fewer numbers of pedestrians evident around suburban streets and local community facilities.

Crash Data Summary:

- 2,558 crash recorded (2011 to 2015)
- 10 crashes (all modes) resulted in fatality within the same time period
- Of these 10 fatal crashes, 0 included a bicycle and 2 included pedestrians

The safety of the network is paramount to ensure people can be encouraged to cycle and walk more as a viable mode of transport. The crash data indicates that while only around 1% of crashes within the City involved either a cyclist or pedestrian, half of the pedestrian crashes resulted in a fatality or someone requiring medical or hospital treatment. The majority of crashes involving a cyclist resulted in property damage only (to the bicycle or vehicle) and not an injury.

A number of cyclist crashes occurred along Patterson Road where there is existing on-road infrastructure and perhaps indicates where off-road infrastructure should be provided. Also, several cyclist's crashes occurred at or nearby local schools.

6. Community and Stakeholder Engagement

6.1 Purpose

Engagement with both the local community and relevant stakeholders is essential to understand the deficiencies in the existing network, and to develop a cycling and walking strategy to ensure its outcome reflect expectations of both the network users and those whose decisions will aid or impede its development.

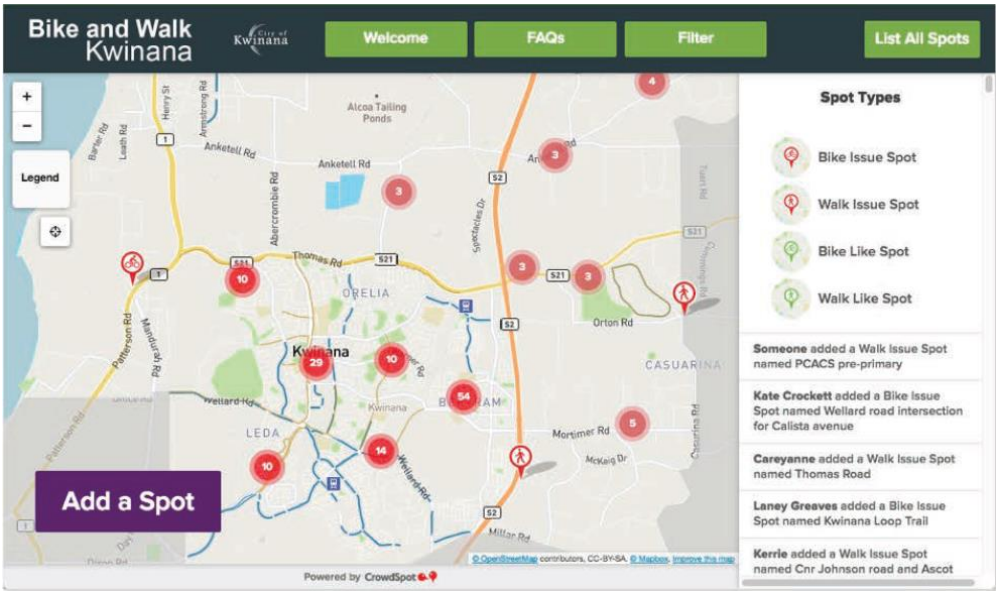
6.2 Process Undertaken

The development of the *Bike and Walk Plan* has sought to build upon existing consultation work undertaken by the City.

6.2.1 Online Engagement

The City engaged with the community through an interactive project map developed by *CrowdSpot* (Figure 6.1). The digital map was accessible via the City of Kwinana website or via *CrowdSpot* http://bikeandwalkkwinana.crowdspot.com.au/ between 15 May and 30 June 2017 (6-week period). The map allowed users to identify locations where they like walking and riding their bicycle (Like Spots) or where they encounter walking and bicycle issues (Issue Spots).

Figure 6.1: City of Kwinana *CrowdSpot* interactive project map



The survey form contained a combination of location specific questions e.g. issue or like in addition to demographic questions of the participant e.g. Connection to the City of Kwinana, Age and Gender (Figure 6.2). People could actively contribute their input to the map either by:

- 'Adding a Spot' to the map via the survey form (four Spot types);
- Commenting on existing spots already on the map; or
- Voting on existing spots already on the map by clicking the 'support' button (Figure 6.3)

Figure 6.2: Inserting information into *CrowdSpot* interactive project map

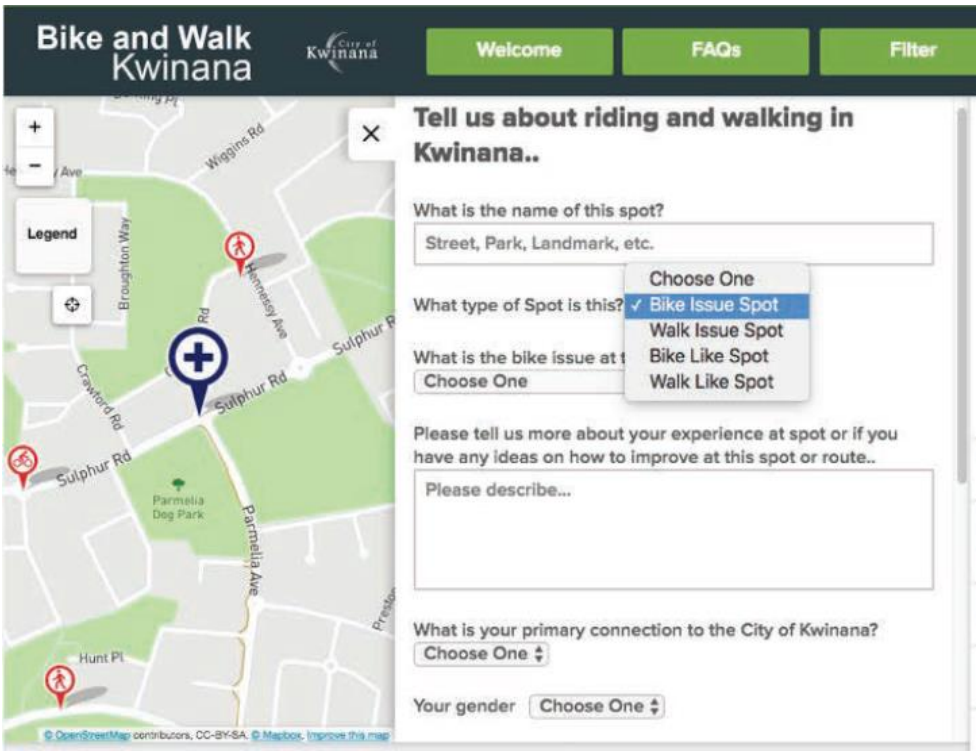
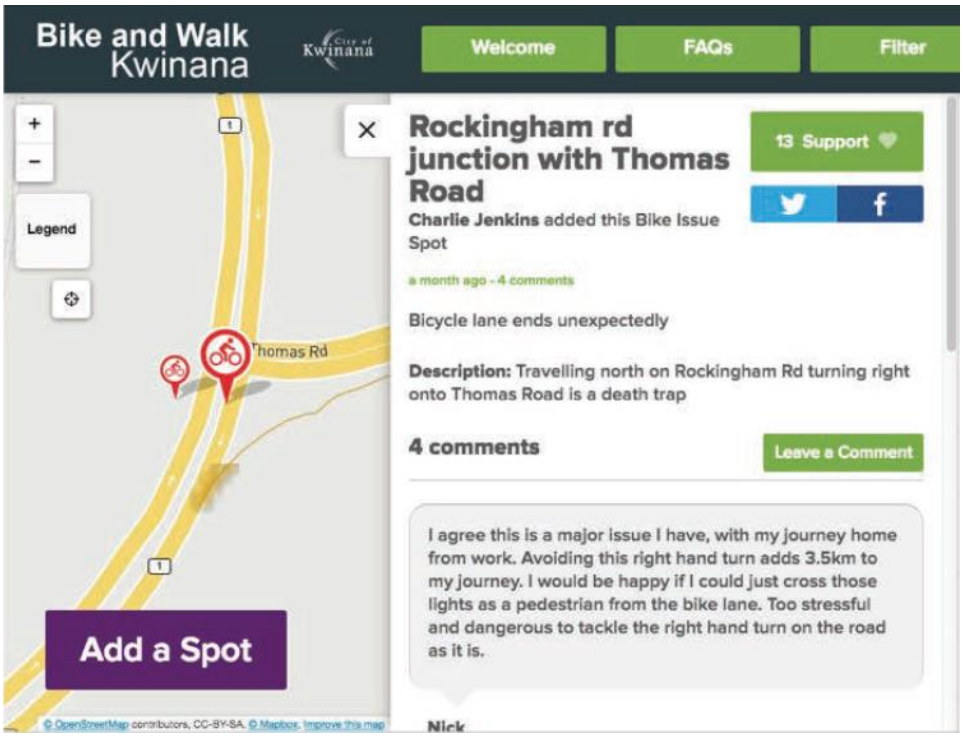


Figure 6.3: Example of issue supported on *CrowdSpot* interactive project map



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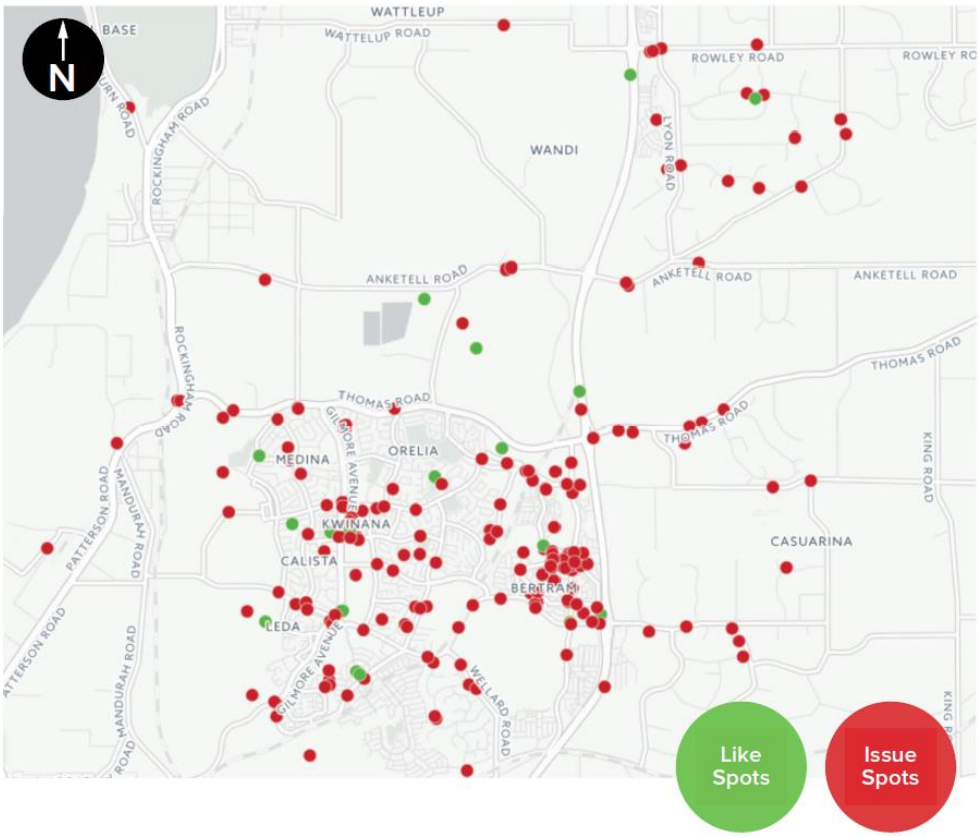
Data obtained from the *CrowdSpot* survey has been mapped and informed the development of the Cycling and Walking network, specifically the prioritisation of the implementation program. City of Kwinana's work with the community over several years provided insight into the priorities for cycling and walking and has been incorporated into this plan. Information gathered from the community fed into the design of a draft network plan that was presented to relevant stakeholders at a workshop held on 28 September 2017.

6.2.2 What did the community tell us?

The data collected through the *CrowdSpot* mapping indicated:

- 137 people provided active input into the survey, either adding a spot, comment or support. In addition, there were 662 passive participants who came to the website, explored the map, or viewed and read various contributions, but did not make a submission.
- There were slightly more women than men who submitted a spot on the map (53%)
- 48% of all participants were between the ages of 35-49. Of note, only 4% of participants were under the age of 24.
- People who live within the City represented 88% of people who submitted a spot on the map (the remaining participants work within the City of Kwinana or visit the City for other reasons).
- A total of 199 spots were created (91% were Issues and 9% were Likes). In addition to the 199 spots were 72 comments and 423 supports, meaning a total of 694 submissions.
- 60% were for walking and 40% for cycling.

Figure 6.4: Spatial distribution of spots



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6.2.3 Cycling Issues

Cycling issues were scattered across the City (Figure 6.5) and the top cycling issues determined from the *CrowdSpot* data are summarised in Table 6.1.

Figure 6.5: Cycling issue spots

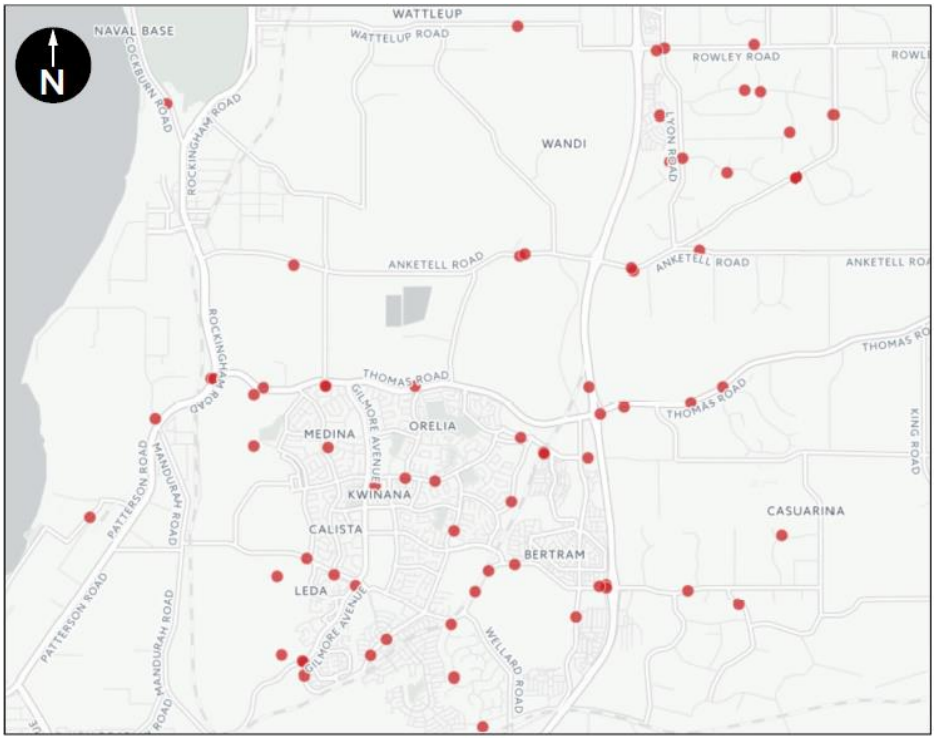

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Table 6.1: City of Kwinana top cycling issues identified

Location	Suburb	Issue
Thomas Road (Freeway to Marri Park)	Casuarina	No bicycle lanes (Supported 27 times)
Rockingham Road / Thomas Road intersection (turning right into Thomas from south)	Kwinana Beach (Main Roads)	Bicycle lane ends (Supported 27 times)
Cockburn Road (Hogg Rd to Sutton Rd)	Naval Base (Main Roads)	Unsafe bicycle lanes (Supported 17 times)
Sulphur Way (Parmelia Av to Orelia Av)	Parmelia	No bicycle lanes west bound, uphill (Supported 13 times)
Rowley Road (Lyon intersection)	Wandi (Honeywood)	Bicycle lane ends (Supported 11 times)
DeHaer Road (Lyon to Rowley)	Wandi (Honeywood)	No bicycle lanes or shared path (Supported 11 times)
Magenup Road (Lyon to Da Haer)	Wandi (Honeywood)	No bicycle lanes or shared path (Supported 10 times)
Wandi Drive (Lyon to Da Haer)	Wandi (Honeywood)	No bicycle lanes (Supported 9 times)
Mason Road & Donaldson Road (entire length)	Kwinana Beach	No path and heavy vehicles (Supported 9 times)
Anketell Road (Rockingham Rd to Freeway)[4]	Postans	No bicycle lanes or shared path (Supported 8 times)
Anketell Road (Freeway to Lyon)	Wandi	No bicycle lanes or shared path (Supported 7 times)

All items in Table 6.1 are proposed in the implementation plan except for the following:

- Rockingham Road / Thomas Road – Main Roads WA project (liaison required)
- Cockburn Road – Main Roads WA project (liaison required)
- De Haer Road – long term project on secondary route, cost to construct is significant and should be paid for with developer contributions
- Wandi Drive – as per Da Haer Road above
- Mason and Donaldson Roads – separate study for industrial area required
- Anketell Road – Main Roads WA project (liaison required)

Other locations with fewer support but notable for defining the deficiencies were:

- Mortimer Road (Freeway to Casuarina Rd) – no bicycle lanes or shared path
- Sicklemore Road (Sulphur to Warner) – no bicycle lanes or shared path
- Holden Close (connection to PSP) – pavement condition is poor and covered with glass
- Johnson Road – no bicycle lanes (developer to provide)
- Kwinana Loop Trail (Gilmore Ave to Sloans Reserve & opposite Blacksmith Dr) – poor surface
- Wellard Road crossing at Calista Avenue – no shared path connection south
- Kwinana Beach Road – crossing train tracks at dangerous angle
- Medina Shopping Centre – no bike parking
- Parmelia Shopping Centre – no bike parking

[4] Section between Clementi and Mandagolup was specifically mentioned

Maintenance issue locations:

- Thomas Road – sand covering path & general maintenance (33 supports)
- Magenup Road – street signs missing / tampered with (10 supports)
- Mortimer Road / Freeway PSP – overgrown vegetation
- Bertram Road – broken glass on path
- Sulphur Road – broken glass on bicycle lane (particularly around Kwinana station)
- Runnymede Gate – gumnuts on bicycle lane

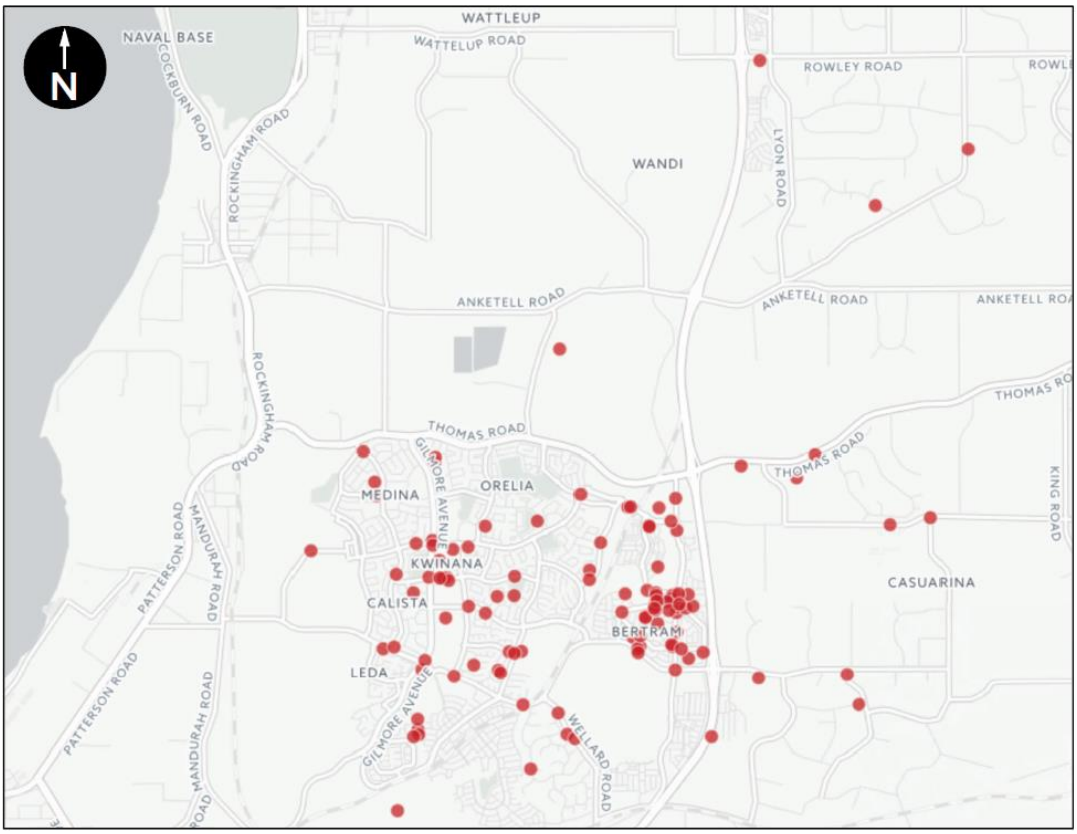
To discuss with City of Cockburn:

- Wattleup Road – no bicycle route from Honeywood Estate / Aubin Grove to the coast.

6.2.4 Walking Issues

Walking issues were concentrated around Bertram and Kwinana City Centre. A large portion of issues were related to deficiencies in infrastructure (no footpath or no crossing) made up 43% of the spots and poor maintenance (14%). The Bertram issues were verified with the Saddle Survey of 25 August 2017.

Figure 6.6: Walking issue spots



The top walking issues determined from the *CrowdSpot* data are summarised in Table 6.2.

Table 6.2: City of Kwinana top walking issues identified

Location	Suburb	Issue
Tranby Way (Champion Dr to Johnson Rd)	Bertram	No footpath on either side (Bertram Primary School) (19 supports)
Trusty Way (crossing at Price Parkway)	Bertram	No median island at crossing (17 supports)
Chisham Avenue (crossing at Pastacup)	Kwinana Town Centre	Pedestrian crossings between Robbos and Peel to be improved (15 supports)
Rowley Road (Lyon Road to Freeway)	Wandi (Honeywood)	No footpath to PSP (6 supports)
Sicklemore Road (near Warner)	Parrmelia	Badly damaged footpath (6 supports)
Sulphur Road (near train station)	Parmelia	Cars parking on path blocking access to station (6 supports, note an additional comment disagreed it was an issue requesting more car parking)
Homestead Ridge (entire estate)	Wellard (Homsetead Ridge)	No footpath in entire estate (4 supports)
Gilmore Avenue crossing (Calista Primary School)	Calista / Kwinana TC	Inadequate time to cross at signals (4 supports)
Mortimer Road (Johnson to Freeway)	Wellard (Emerald Park)	No footpath south side (developer constructing) (3 supports)
Parkfield Boulevard / Orient Way intersection	Bertram	No crossing of Parkfield to access Orient (6 supports)
Bertram Road (Guard crossing to Kings College entrance)	Bertram	No footpath to Kings College entrance (6 supports)
Unicorn Street (Eliza to Parkfield)	Bertram	No footpath (5 supports)
Chieftain Street (Moombaki to Parkfield)	Bertram	No footpath on south side (5 supports)
Yelka Way (Chieftain to Unicorn)	Bertram	No footpath (4 supports)
Champion Drive / Moombaki Avenue intersection	Bertram	Path and ramp lead to centre of roundabout instead of across (3 supports)
Caroline Crescent crossing of Parkfield Blvd	Bertram	No kerb ramp on north of Parkfield (4 supports)
Whiteman Crescent (crossing of Johnson Rd)	Bertram	No crossing facilities (kerb ramp missing) (3 supports)
Trusty Way (adjacent to school carpark)	Bertram	No footpath (2 supports)

All items in Table 6.2 are proposed in the implementation plan except for the following:

- Homestead Drive footpaths – some projects are identified towards the north of the estate to connect to Wellard Oval (see Table 16.1). Budget constraints prevent all roads in the estate receiving footpaths in the implementation phase and further consultation is required to ascertain the community's position of footpaths on every street in the rural setting.

Other locations with fewer support but notable for defining the deficiencies are:

- Chipperton Road, Bertram – no footpath.
- Johnson Road, Bertram – no crossing facilities at Ascot Parkway.
- Millbrook Avenue, Bertram – no crossing facilities at Camborne App.
- Parkfield Boulevard, Bertram – no kerb ramp at Ganges Way.
- Djilba View, Leda – no footpath.
- Langridge Crescent (Littlemore to Butt), Orelia – no footpath.
- Chipperton Road, Bertram – no footpath.
- Gilmore Avenue (Sulphur Rd to Wellard Rd) – inadequate pedestrian crossings especially between Kwinana Adventure Park and Town Centre.
- Simmons Loop – no footpath.
- Skottowe Park, Parmelia – no footpath connecting park to Skottowe parkway (users navigate carpark).
- Casuarina Road (Mortimer to Orton), Casuarina – no footpath.
- Magenup Drive, Wandi – no footpath (to access new primary school).
- Farmer Way, Parmelia – no footpath.
- Johnson Road (Sulphur to Thomas), Parmelia – no footpath (developer to provide).
- Barker Road, Wellard East – no footpath.
- Spectacles Drive, Spectacles – no footpath (Tramway Reserve Trail).
- Woodley Way, Parmelia – no footpath.

Maintenance issue locations:

- Magenup Road, Wandi – street signs missing / tampered with (10 supports).
- Moombaki Avenue extension to Price Parkway – safety for children pickup.
- Bertram Road – overgrown maintenance obstructing view to cross Parkfield Blvd.
- Chisham Avenue, Parmelia – sand and tree debris on path.
- Munday Way, Medina – sand on path near kindergarten and debris outside house #19.
- Centennial Avenue, Bertram (no specific location provided) – broken pole edges hazard to children.
- Kwinana Loop Road at Gentle Road, Calista – weeds and litter.
- Leasham Court, Medina – overgrown vegetation.
- Sulphur Road (Johnson Rd to Station), Parmelia – broken glass on path.
- Johnson Road (Sulphur Rd to Brixton Gate), Bertram – broke glass on path
- Bertram Medical Centre, Bertram – damaged residential bin in adjacent vacant land.
- Medina Avenue, Medina – tree root damaged footpath (neighbourhood plan).
- Henley Reserve, Wellard – damaged path.
- Jeffers Court path connection, Orelia – litter.
- Tunnicliffe Street – damaged path and insufficient width; Parmelia Avenue intersection power pole in path (widen path around pole).

Issues for noting:

- Sunrise estate connectivity to Wellard Primary School in Emerald Park.
- Wellard Road / Meares Avenue roundabout – congestion challenging for traffic. wardens helping kids cross to Peter Carnley Anglican Community School.
- Moombaki Avenue – Speed of cars through roundabout dangerous for kids walking home from Bertram Primary School.
- Bertram Road / Johnson Road – difficult crossing for pedestrians.
- Shannon Corner / Centennial Avenue – dangerous intersection without give way sign.
- Lighting around Wellard Station – poor lighting for people walking home towards Calista at night.
- Lighting of Calista Avenue – poor lighting.
- Lighting of Sulphur Road – poor lighting on path next to Kwinana Train Station.
- Lighting of Djilba Park – poor lighting.
- Ascot Parkway – poor lighting.
- Everglades Park, Bertram – dog business regularly in park (requires dog bags).
- Robbos Way / Darius Drive – guard rail installed blocks crossing of both roads.
- Meares Ave / Chisham Ave roundabout – difficult crossing for pedestrians, blind spots reported and concern for students walking to Calista Primary or Gilmore College.
- Parsons Avenue – poor lighting.
- Kwinana Loop Trail – signage and promotion to be improved.
- Medina – desire from community to make environmentally friendly "green" community with landscaping.
- Thomas Road was picked up as requiring a footpath east of freeway to Marri Park Drive but has been included in cycling.
- Everglades Park – no bins for dog business.

6.2.5 Incorporating into Long-Term and Neighbourhood Plans

The issues raised in the *CrowdSpot* survey helped to understand the existing network (Chapter 7), however more importantly, the results will be used to guide the long-term network and implementation plans for the overall City of Kwinana area, and the individual neighbourhoods (Chapter 10). For example, due to the issues raised in Bertram, the area has been considered for a pedestrian improvement plan and is presented in Chapter 11.

6.3 Consultation with neighbouring local authorities

During the development of this plan, individual meetings have been held with each of the City's neighbouring councils (Cockburn, Rockingham and Serpentine Jarrahdale). The following is a summary of the key links identified with each local authority that this bike plan should ensure connects across boundaries.

6.3.1 City of Cockburn key routes

Key cycle routes identified within the City of Cockburn Bicycle and Walking Network Plan, 2017 are as follows:

- Kwinana Freeway - Eastern side (PSP)
- Rowley Road (Secondary Route)
- Mandogalup Road - (Local Route)
- Tramways Trail
- Freight Railway Line (Secondary Route)
- Rockingham Road (PSP)
- Ocean Recreational Path (Local Route)

It is noted that none of the above noted routes are planned to be delivered by the City of Cockburn within the next five-year period (2017 – 2022). However, this may change as priorities or demand changes and so need to be planned on the City of Kwinana's side of the LGA boundary.

Hammond Park and Aubin Grove, including the new Vivente estate under construction are to be connected by Honeywood estate and Qube development in Kwinana (further details are provided in Chapter 18). As mentioned in Section 6.2.3, Wattleup Road is a secondary route with demand from the community in Honeywood estate to reach the coast by bicycle, which would also benefit people in Hammond Park and Aubin Grove.

6.3.2 City of Rockingham key routes

Key Routes identified within the City of Rockingham Bike Plan, 2013 are as follows:

- Rockingham to Kwinana Beach Recreational Path (Local Route)
- Paterson Road (Secondary Route)
- Dixon Road-Mandurah Road-Millar Road (PSP)

Discussion with the City of Rockingham noted that they have no schedule of works to implement these routes.

6.3.3 Shire of Serpentine Jarrahdale

Through discussion with the Shire of Serpentine Jarrahdale it was evident that the current Bike Plan, 2012 only identifies strategic links that may connect into Kwinana. However, through discussion additional routes were identified as follows:

- Anketell Road (Local Route)
- Thomas Road (PSP)
- Orton Road (Local Route)
- Mortimer Road – Coyle Road (Local Route)
- Freight Railway Line (Secondary Road)

As with the City Rockingham the Shire noted that they have no schedule of works to implement these routes.

7. Understanding the Existing Network

The City has a high number of existing designated shared paths as well as wide footpaths suitable for cycling. However, within the network there are a lot of missing sections. There are a smaller number of existing on-road cycle lanes within Kwinana, again with missing sections. Some of these projects have been constructed by the City and guided by previous bicycle plans, while others were implemented by developers and are now required to be maintained by the City.

The two existing railway stations and the schools within Kwinana are all served by shared paths or on-road routes. However, the paths are not always connected, and the road environment does not provide a safe cycle environment.

It is also clear that there is a lack of infrastructure east of the freeway and along the freight line corridor.

7.1 The Existing Regional Cycle Network

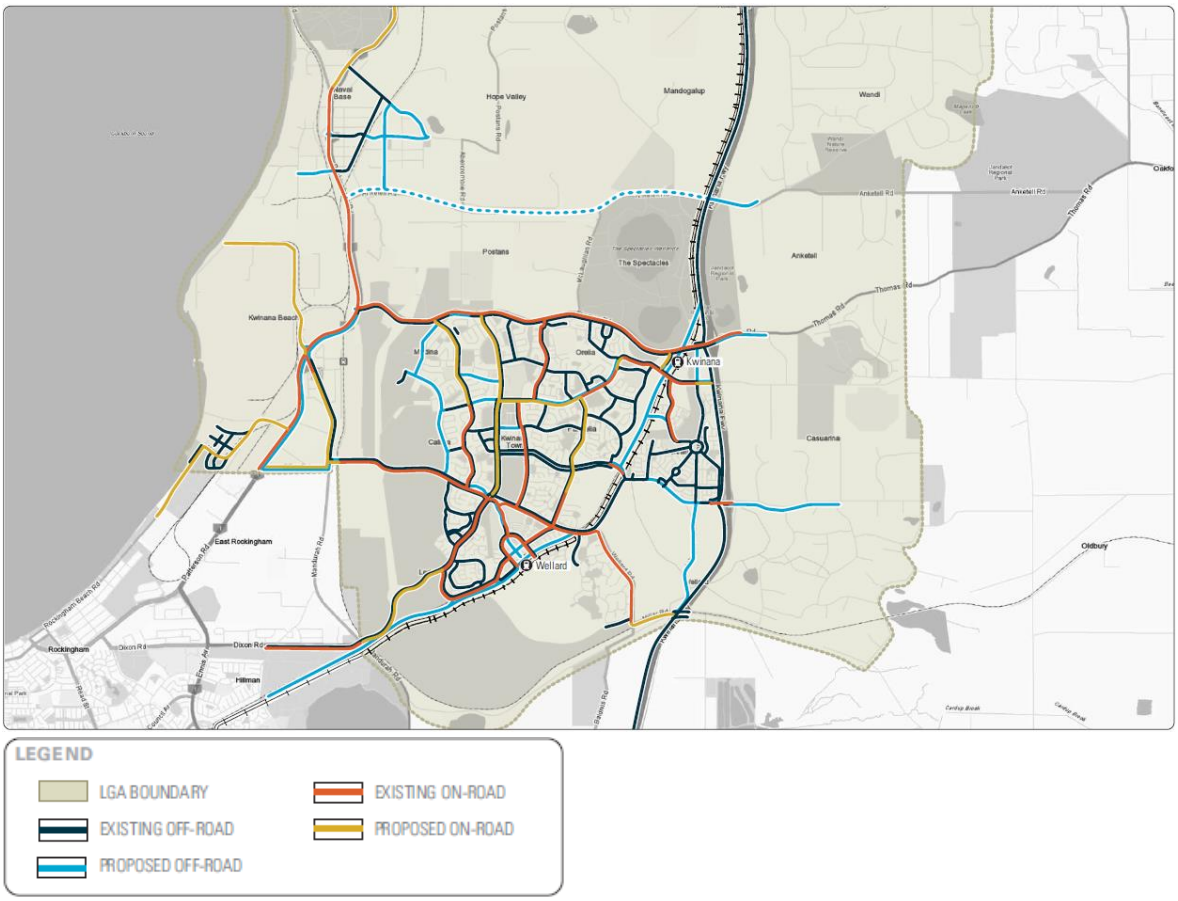
Within the context of regional cycling infrastructure, Kwinana benefits from having a Primary Route in the form of a Principal Shared Path (PSP) running along the western side of the Kwinana Freeway. However, as the Mandurah railway line leaves the freeway reserve just north of Thomas Road, the PSP continues along the freeway and therefore does not provide access to the two railway stations, Kwinana and Wellard, except for a small section approaching from the north.

The Recreational Path network stops at Rockingham East (within the City of Rockingham) to the south of Kwinana, and at Henderson (within the City of Cockburn) to the north of Kwinana. The gap in the RSP between these two points is largely due to the large industrial area within Kwinana which is situated between Rockingham Road and the coast.

7.2 The Existing Local Cycle Network

This neighbourhood cycle and walking network plan is the fourth plan undertaken by the City of Kwinana, with the most recent in 2010. The cycling network proposed in the Kwinana Bike Plan for 2010 is shown in Figure 7.1. An enlarged map of Kwinana is provided in Appendix C.

Figure 7.1: Proposed cycling network 2010



The Kwinana Bike Plan (2010) proposed 43 projects. Figure 7.2 shows the location and status of the projects recommended in 2010. The detail of each proposal and whether it has been or is planned to be implemented is presented in Appendix C.

- 14 projects were implemented
- 8 projects are either underway or will be completed by Main Roads WA or land developers
- 13 projects are outstanding and were considered as part of the development of this 2017 plan
- 8 projects were deemed unfeasible or not required by the City and are not recommended in the 2017 plan unless requested in the Crowd spot survey.

It is noted that the outstanding projects tend to be focused around Medina, Orelia and Parmelia, while the completed projects are generally in the newer suburbs of Bertram, Leda and Wellard (reflected in projects constructed by developers). The outstanding projects have been considered as part of the development for the long-term network and the implementation plan.

Table 7.1: 2010 Plan outstanding projects

#	Project	Status	Comment
3	Beard St Shared Path	Outstanding	Industrial connections not priority of 2017 plan
5	Rockingham Rd / Thomas Rd intersection	Under Construction	Project identified in Crowd Spot (27 times)
7	Patterson Rd / Mandurah Rd intersection	Outstanding & Programmed	Future PSP alignment (ensure standards met)
11	Bingfield Rd W, Tucker St, Beacham Cr, Westbrook St Shared Path	Partially Complete	Local Route network
12	Medina Ave Cycle Lanes	Outstanding	Low priority (path or cycle lanes)
14	Gilmore Ave Cycle Lanes (Thomas Rd – Wellard Rd)	Outstanding	Alternative alignment considered
16	PSP Design Wellard Rd - Rockingham Stn	Outstanding	Continue design and progress alternative route
19	Thomas Rd / Johnson Rd intersection	Outstanding & Programmed	PSP connection
20	PSP Design Kwinana Stn - Wellard Rd	Outstanding	Developer to construct to PSP standard
23	Mortimer Rd Shared Path (Freeway - Barker)	Programmed	Developer to construct (check standard)
26	Johnson Rd Shared Path (Sulphur - Thomas)	Programmed	Low priority – developer to construct
27	Holden Cl Shared Path & Cycle Lanes	Not Proceeding	Bike Boulevard (quiet street)
29	Sulphur Rd Cycle Lanes (Durant-Nottingham)	Outstanding	Proposed in 2017 (consider two-way cycle track)
30	Cycle Lane Design Sulphur Rd (Parmelia – Gilmore)	Outstanding	Reconsider project; signage of present treatment
31	Orelia Ave Cycle Lanes (Menli – Thomas)	Outstanding	Consider two-way cycle track
32	Parmelia Ave (Sulphur – Tunnicliffe)	Outstanding	Consider two-way cycle track
35	Pace Rd Path upgrade (Medina – Gilmore)	Outstanding	Consider bike boulevard
37	Rockingham Rd / Frederick St intersection	Outstanding & Programmed	Check status with Main Roads
38	Rockingham Rd Cycle Lanes (Cockburn – LG Boundary)	Partially complete	Check location / PSP
39	Rockingham Rd / Beard St intersection	Outstanding	Check status with Main Roads
40	Rockingham Rd / Cockburn Rd intersection	Programmed	Check status with Main Roads
43	Anketell Rd Shared Path	Outstanding	Secondary route (Naval Base to Armadale)

Table 7.2: 2010 Plan recommended projects considered unnecessary or unfeasible

#	Project	Status	Comment
4	Mason Drive Shared Path	Not Proceeding	Northern section part of Local Route network
8	Mandurah Road Cycle Lanes	Not Proceeding	PSP on freight line preferred option for network
9	Office Road Cycle Lanes	Not Proceeding	Beach & Ocean recommended route options
10	Thomas Rd Shared Path (at Bingfield Rd E)	Not Proceeding	Consider bike boulevard on Bingfield Road East
13	Calista Avenue Path upgrade	Not Proceeding	Focus on secondary route Coleman-Bright
18	PSP Design Thomas Road - Freeway PSP	Not Proceeding	Current connection Thomas Rd adequate
27	Holden Close Shared Path & Cycle Lanes	Not Proceeding	Bike Boulevard (quiet street)
41	Wellard Road Shared Path (at railway crossing)	Not Proceeding	PSP to progress

Recent developments resulted in new bicycle lanes, especially in Wellard. While this is a positive outcome and developers should be constructing cycling infrastructure in new subdivisions, bicycle lanes on distributor roads is no longer considered best practice either in Western Australia or internationally. Protected or buffered bicycle lanes (see section 18) are a now a minimum standard.

The 2010 plan recommends that consideration should be made to modify the requirements for development Planning Scheme to:

- Provide end-of-trip facilities in new developments as suggested in the Austroads Guide to Traffic Engineering Practice;
- Incorporate bicycle lanes into the design of District Distributor level or greater;
- Upgrade the standard for all Neighbourhood Connector and higher order Access Roads to incorporate shared paths; and
- More generally to require consideration of cycling infrastructure within future developments to connect into and extend the proposed bicycle network.

The 2010 bike plan also notes that bicycle parking policies should be implemented as retrofit works for existing government facilities and implemented for all new projects.

An audit of the existing road and pedestrian path networks was completed in 2010. The main findings from this audit, as noted in the 2010 Bike Plan were:

- Good network of off-road paths, however very few are formally designated as shared user paths to allows cyclists to legally use them;
- High quality concrete paths, rather than pavers which are unsuitable for cyclists;
- Most paths at least 2.0 meters wide;
- Existing Kwinana walking routes represent a great opportunity for 'casual' cyclist;
- Great potential for a comprehensive network based upon existing infrastructure;
- Designation signage mostly non-existent;
- Wayfinding difficult as a result of grab rail locations and lack of signage; and
- Intersection design creates additional risks for cyclists in many locations.

The existing cycle network (including footpaths wide enough to safely allow for cycling) have been mapped and presented Figure 7.3.

Figure 7.2: Location and status of project priorities 2010 plan

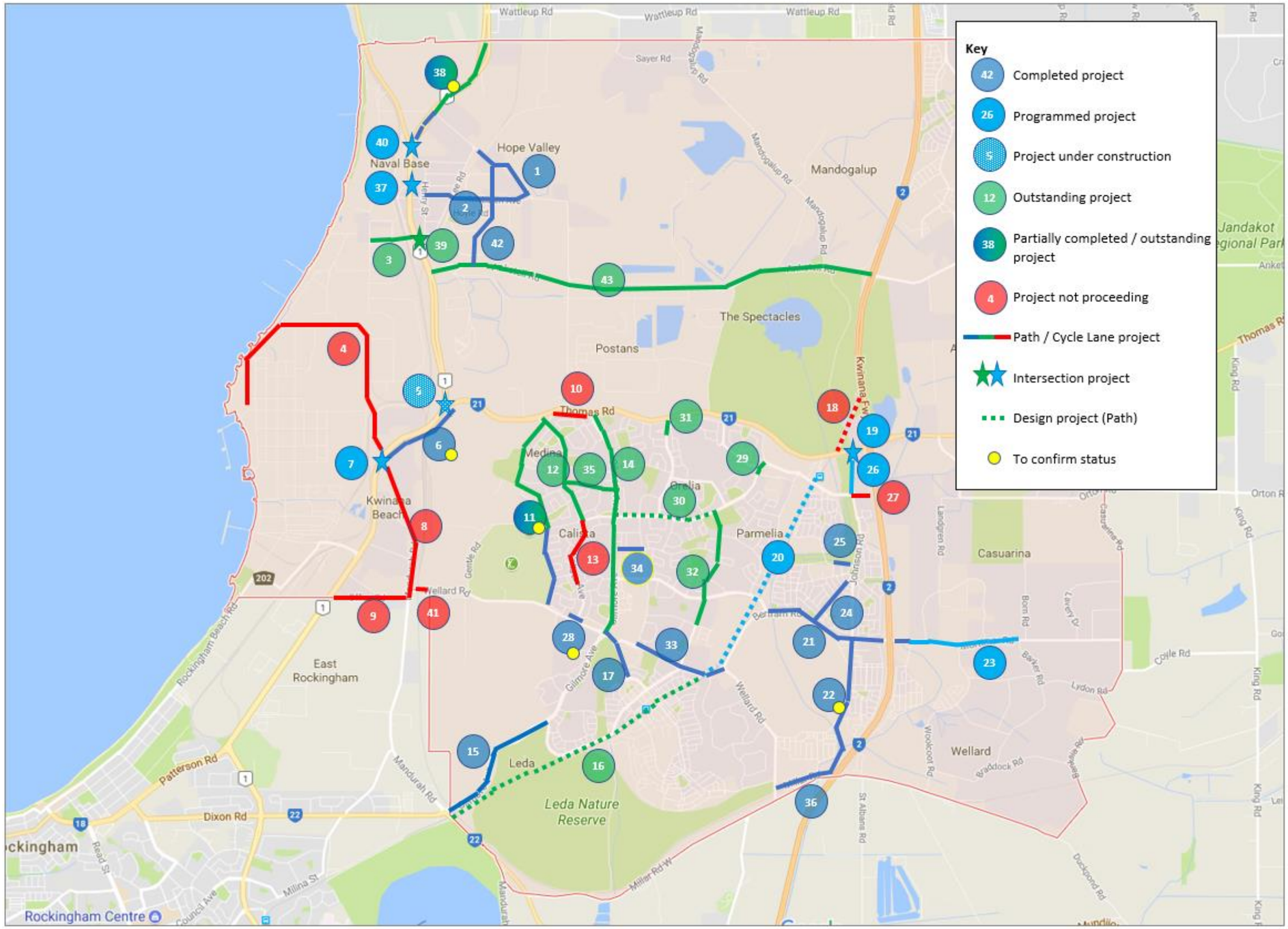


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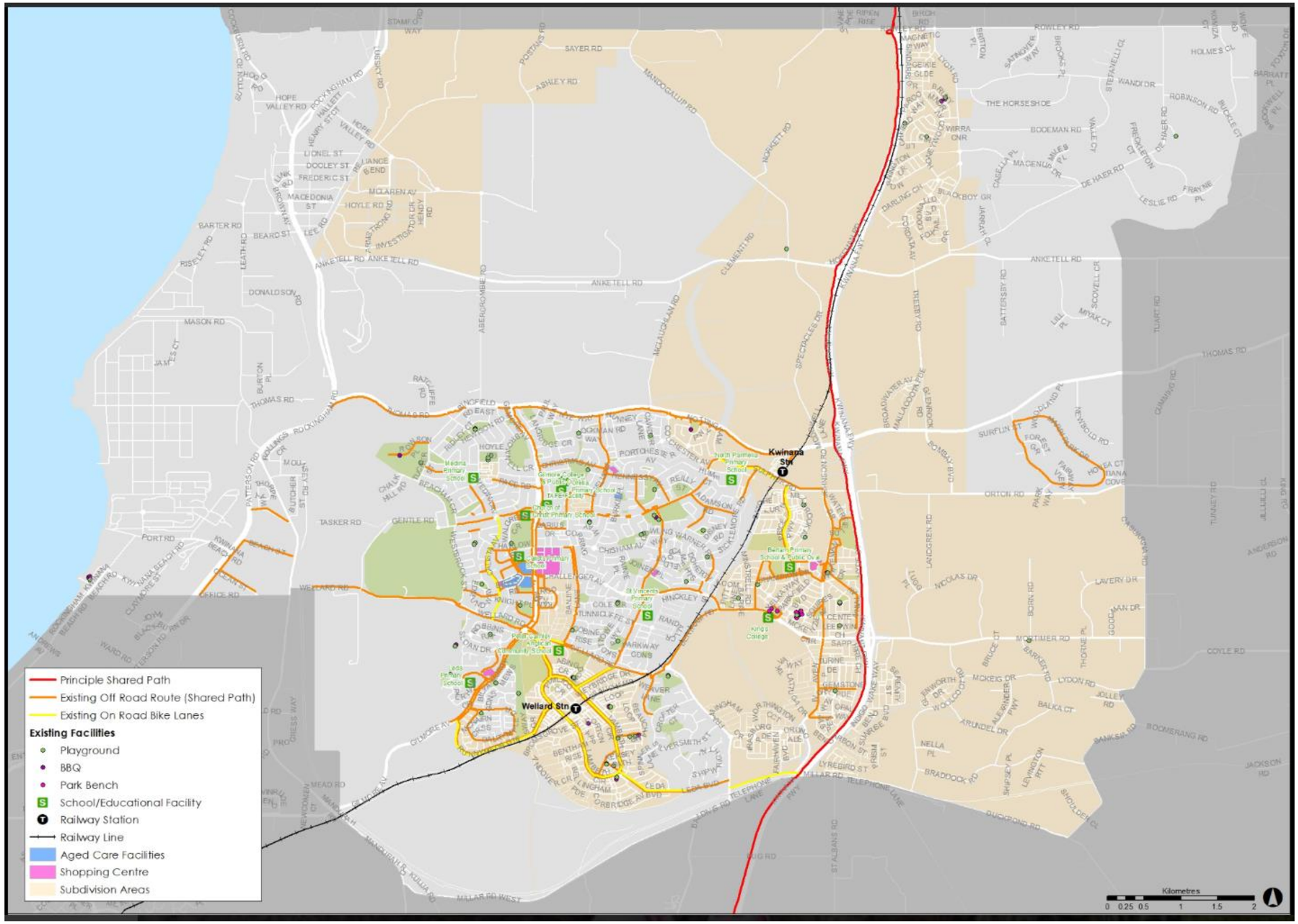
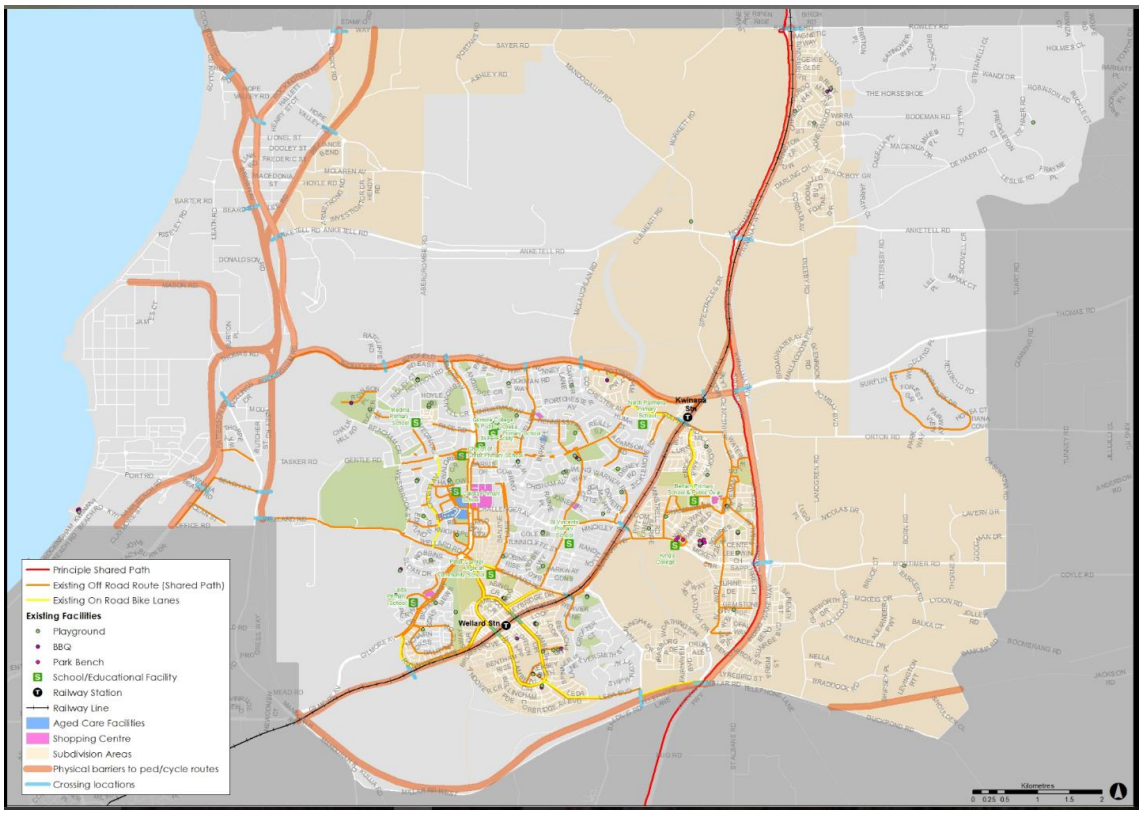
Figure 7.3: Existing cycle network City of Kwinana



7.3 Existing Pedestrian Network

While footpaths have been provided within high activity areas (such as Kwinana City Centre, and Wellard Railway Stations and local centres) as well as around schools, there are several residential roads that do not have a footpath on either side of the road. Further, a number of intersections also have inadequate pedestrian crossing facilities, especially facilities that are disability access compliant. There are also several barriers throughout the City that prevent the ease of movement for pedestrians or cyclists – these are illustrated in Figure 7.4.

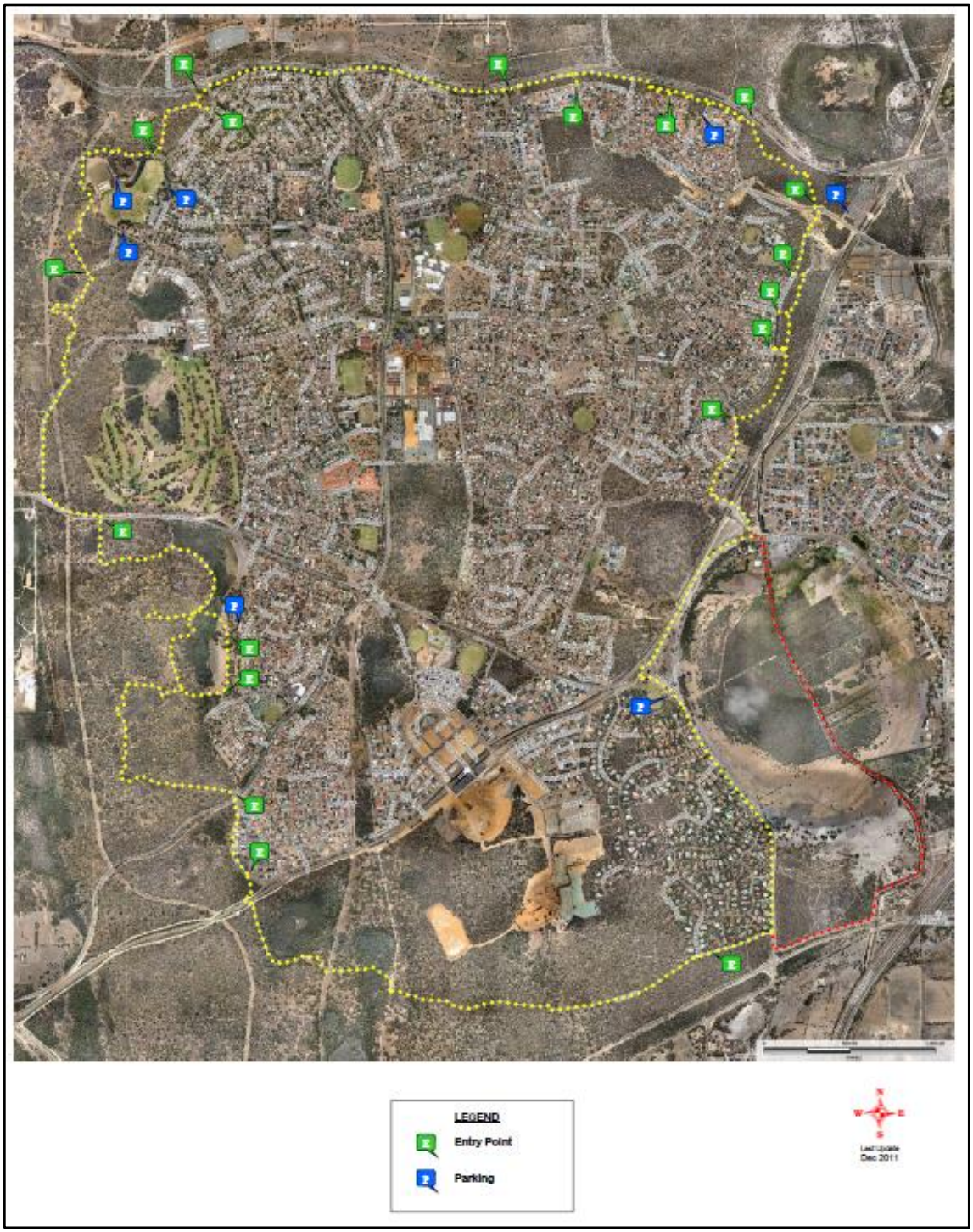
Figure 7.4: Existing barriers to cycling and walking



Further to this, to encourage active travel and to get more people walking as a fun, leisurely activity, the City could promote guided walking tours around the main residential area of the City, known as the Kwinana Loop.

The Kwinana Loop utilises a number of existing paved footpaths as well as unpaved paths and 'goat trails' through bush land and nature reserves. It crosses a number of roads and both the passenger and freight railway lines. There are a number of entry points into the trail (clearly defined) as well as nearby parking facilities to aid access. The Kwinana Loop is presented in Figure 7.5.

Figure 7.5: Kwinana Loop Walking Trail



This plan will have a focus on the vulnerable portions of the pedestrian community by assessing existing pedestrian networks to and from local schools and aged care facilities.

8. Design principles for the Bike and Walk Plan

8.1 High level principles when planning walking and cycling facilities for varying land uses within the City of Kwinana

Facilities will vary depending on adjacent land use and whether the route is through an inner-urban area or a suburb area context. Facilities will also need to match the intended user type and destination.

For instance, cycling and walking facilities linking to a school will need to be safe, convenient and easy to use – thus, off road, shared or separated facilities, bike boulevards or shared spaces will most likely be appropriate. However, for a commercial, office or transport node destination (which is more likely going to attracted commuting traffic) on-road or off-road separated facilities to allow for high speed travel will be more appropriate.

Routes are not required to follow road alignments and may be aligned through open space if the alignment provides better grades, directness or attractiveness.

Types of riders

For new subdivisions, the planning for road categories to incorporate Active Travel and have a consideration of facility requirements should influence block layouts and road reserve widths/cross-sections.

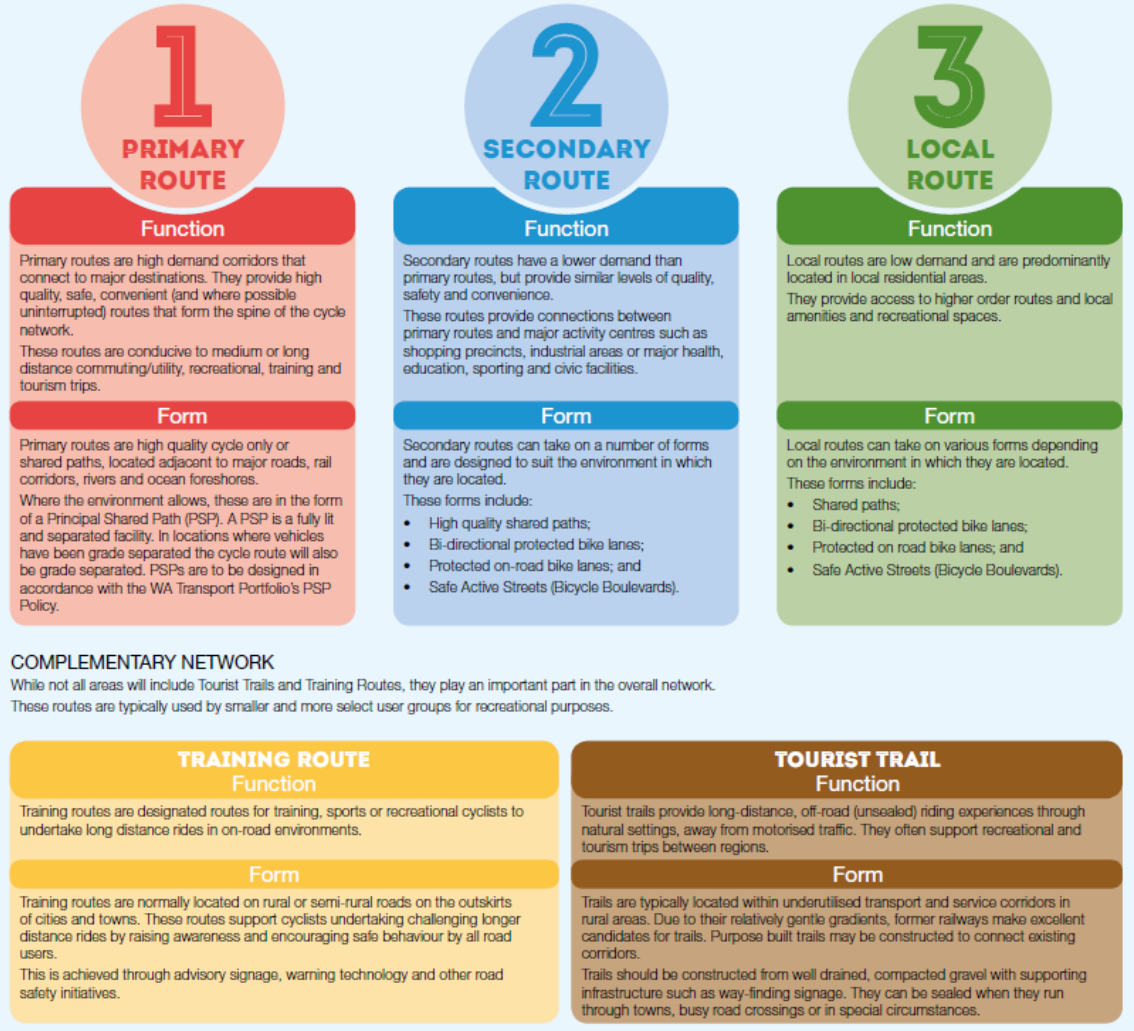
High level cycling principles need to include the following:

- Providing on-road cycle facilities on high speed and/ or high-volume roads:
  - Idea is to keep cyclists off these roads as much as possible.
  - May not be always feasible.
  - In such instances, have a protected bike lane as a bare minimum.
- Location of footpaths:
  - State Government is moving to footpaths on both sides.
  - Footpath dimensions to increase to 2m as a minimum.
  - Footpaths may need to be wider closer to schools/ activity centres – consider Shared Paths in these instances.
  - Footpaths are now de-facto Shared Paths as well with the recent change in law.

- Separated mode facilities:
  - Purpose is to minimise conflict between pedestrians and cyclists.
  - State Government is looking at rolling these out for the PSP network.
  - One example is on the Fremantle PSP near Subiaco – very short section though (also needs pedestrians and cyclists to merge at intersections – giving way to traffic).
  - Use these as appropriate.
  - Better to have some off-road facility than none.

The *Perth and Peel @3.5 Million Transport Plan* provides a cycling hierarchy to be adopted across Western Australia, presented in Figure 8.1.

Figure 8.1: Western Australian Cycling Network Hierarchy



The following descriptions for the differing route hierarchies are to be adopted for the City of Kwinana:

- **Primary Routes**

PSPs will continue to form the backbone of Perth's cycling network. Considered as "freeways for bikes" these routes serve high order, interregional movement purposes. They should be of high standard, with minimal horizontal or vertical curvature. In terms of their built form, PSPs should

ideally be of at least 3.5m in width and grade separated at all intersecting roads/railways. Wherever possible, separation should be provided between pedestrians and cyclists.

- **Secondary Routes**

Sitting below the PSPs in the route hierarchy are Secondary Routes. The aim of these routes is to provide links between Perth's various strategic, secondary, district and specialised activity centres, as well as train stations. Secondary Routes should be considered as "arterial roads for bikes" allowing safe and direct access to, from and through activity centres. In terms of their built form, it is critical that secondary routes are attractive to all cyclists regardless of their age, confidence or experience level. They can consist of shared paths of PSP standard, separated bi-directional bike lanes or Bike Boulevards. **Unprotected bike lanes or sealed shoulders are considered inadequate for secondary routes**.

In terms of route selection, the philosophy behind secondary routes differs, in general, between newer suburbs and older suburbs. In older, more established suburbs (pre-1965), arterial roads tend to have narrow reservations and are intersected by numerous side roads and driveways. They therefore, tend to be unsuitable for separated or bi-directional facilities. Fortunately, older suburbs are normally laid out in a grid-like pattern which makes it easier to implement Bike Boulevards on adjacent streets.

In newer (post-1965) suburbs, quiet suburban roads are normally of curvilinear nature and often terminate in cul-de-sacs. They are therefore usually unsuitable for secondary cycling routes. However, in these areas arterial roads (in the form of Local Distributors) tend to be reasonably direct and nearly always have sufficient road space available to provide separated cycling facilities that are attractive to all cyclists.

- **Local Routes**

Sitting below secondary routes in the route hierarchy are local routes. The purpose of local routes is to collect cycling traffic from local roads and distribute it to the Secondary and PSP networks. These routes may consist of on-road cycle lanes, Bike Boulevards, greenways or designated quiet suburban streets (communicated using sharrows and appropriate traffic calming treatments). However, where possible, and particularly in greenfield situations, local routes should provide physical separation from motorised traffic.

- **Long Distance Trails**

To provide long distance, off road cycling experiences in natural settings, away from motorised traffic. Trails often support recreational and tourism trips between regions.

- **Training Circuits**

To provide training or sports cyclists with designated routes in which to undertake long distance rides in on-road environments.

Figure 8.2 illustrates the draft cycling network which State Government is anticipated to confirm through consultation with local government by 2020.

Figure 8.2: Cycling network in Perth and Peel @3.5 Million Transport Plan

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8.2 Five Guiding Cycle and Walking Network Design Principles

Each group has different needs and demands requiring tailored infrastructure solutions, dependent also on their level of confidence as a bike rider. Of utmost importance for any cycle and pedestrian network is the need to ensure the network adheres to the five guiding principles to network planning; Safety, Directness, Coherence, Attractiveness and Comfort.

Safety

Well-designed cycle network infrastructure improves and enhances the road safety of riders, pedestrians and motorists. Intersections should be designed to explicitly include bicycles as well as other categories of road users. Special intersection designs that include a path for bicycle riders are an important element of integrated network design. Mid-block treatments need to provide safe and easy major roadway crossings for riders and pedestrians. Public lighting and other features that improve personal safety are also crucial. Particularly for routes more likely to be used at night, or for pedestrian crossings (both formal controlled and uncontrolled) which should have appropriate Discrimination Disability Act (DDA) compliant design. Cycle routes past bus stops should be designed for safe accommodation of riders, bus passengers, other pedestrians and vehicles. Where possible cyclists and buses should be segregated in their own lanes, however, at times there may be a requirement for buses and cyclist to share infrastructure. It is also important that laneways used by pedestrians are also well lit.

Directness

Network infrastructure should be as direct as safely practicable and based on desire lines. Long detours should be avoided but should be balanced against the problems of topography - a slightly longer route may work better because it contours around a hill rather than tackling it at its steepest climb. Delays due to prolonged crossing times of major barriers should be avoided with the aim to ensure that riders and walkers can maintain safe, comfortable and consistent travel throughout the length of the route. Indirect cycle routes or excessive delays may lead cyclists to choose more direct routes with greater risk. Research suggests that some cyclists are unlikely to divert to safer routes greater than 10% extra in length (Hudson, 1982)[5].

Coherence

A bicycle and pedestrian network should form a connected network linking people to places via secondary and local routes. The network should be continuous and be very clear to the user where the facility leads. Intersections should provide a clear path for bicycle riders and pedestrians as well as for other modes. The quality of network facilities should also be consistent throughout the length of the route regardless of whether the facility uses a separated or shared road profile. Measures to ensure consistency and coherence include using same coloured surfacing and road way markings throughout (for both on road and off-road cycling) and use the same signage and destination finger posts throughout.

Although consideration should be given to maintenance costs as colour surfacing will need replacing frequently to keep it from looking patchy and worn. Routes should be easy to find from local streets and the network should be of such a density that there is always a choice of nearby routes available to the user.

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[5] Cycle Network and Route planning guide, Land Transport Safety Authority, NZ, 2004 and Hudson, M (1982) Bicycle planning: Policy and practice, The Architectural Press Ltd, London, United Kingdom.

Attractiveness

Community support exists for cycling and walking provided it is an enjoyable activity. Enjoyable cycling and walking require well designed and located facilities. Clear well-placed signposting should indicate major destinations, while centre lines and edge lines should indicate the serious transport intent of the off-road sections of routes. Cycle routes should also feel like socially "safe" places to be. The community prefers well-lit pathways and open-to-view routes rather than dark and dingy alleyways. Cycling and walking routes around natural landscapes can add to the enjoyment and increase the use of the infrastructure.

Comfort

The bicycle and pedestrian network must be easy to use for all types of riders and pedestrians. A smooth well-maintained riding surface (free of debris) is essential, both for comfort and operating safety. Depending on the speed and volume of other traffic (motor vehicles or pedestrians), some level of separation is often needed. Clearly marked bicycle facilities that allocate operating space to bicycle users and pedestrians are the most appropriate types of facilities on all but low traffic volume and low speed roads. Effective intersection treatment is critical to ensure comfortable and safe crossing for cyclists and pedestrians. Rain and wind discourage cycling. Measures to reduce their effects and make cycling and walking more enjoyable include:

- considering walls, embankments or suitable hedges next to paths, but being aware of maintaining public surveillance;
- paying attention to exposed paths near foreshores or ridges;
- providing shelter at critical destinations.

8.2.1 A connected cycling network

Route choice is particularly important to cyclists because the availability of additional routes can often help them to overcome the challenges of difficult terrain or traffic conditions depending on the time of day. Trip purpose (recreational, commuter or with family/children) will also influence user needs and subsequently route choice.

A decision to take a particular route will depend on the riders' own ability and the rider's assessment of prevailing traffic volumes and speeds (pedestrians on paths or vehicles on roads), the number and type of vehicle interaction points, surface conditions, terrain (hills) and the weather. These variables will influence a rider's choice to use sections of either Recreational or Local Routes (using off road facilities or on-road within slow speed environments or travelling on higher speed on-road cycling routes of PSP's to complete a journey).

The road environment is not constant and as a result, people not comfortable riding on an arterial road bicycle lane during weekday peak hours may prefer this type of facility on weekends or early in the morning due to lower vehicle traffic volumes weighted against the perceived higher-risk of using a path where pedestrians have priority. Faster moving cyclists may assess the collision hazard from meandering pedestrians and dogs on paths as a higher risk than the hazards present on the road at that time.

In this regard, a critical aspect of this *Cycle and Walk Plan* is the provision of link paths or transitions wherever possible to allow easy interchange between differing cycling infrastructure.

A key principle of this plan is to enable a cyclist to feel safe complete their journeys. In some arterial and major street corridors, particularly those which run through open space areas, bicycle lanes may be provided paralleling paths within the verge area. Both facilities cater for the needs of the various users and are highly valued by the riders who use them.

This approach is supported by the Austroads study, *Cycling on Higher Speed Roads* which states that "Ideally, all high-speed roads would cater for a range of (rider) abilities with a good quality sealed shoulder or bicycle lane (for roads that are not access controlled (motorways)) and an off-road path."

8.2.2 An accessible pedestrian network

An important element of this plan is ensuring that walking is also a viable alternative for short trips. The implementation of a network of shared-use paths will have a huge benefit to pedestrians. As the plan is developed over the long-term, a network of shared use paths, safer intersections and low-speed local-road environments will all benefit the pedestrian. Further, as required, where there is a high pedestrian or cyclist use, separation of cyclists and pedestrians will also be of huge benefit for pedestrians.

A key part of the development of this plan is to ensure the two key user groups that are most vulnerable, children and the elderly, are adequately provided for. This can be undertaken through the implementation of a **Safer Routes to School** program and planning and design for **Accessible Pedestrian Routes**, both of which are discussed in more detail within this plan.

8.3 Defining the user

There is recognition that the plan should cater for all types of bicycle users and to achieve this, there needs to be a commitment towards providing separation between cyclists and vehicles as well as cyclists and pedestrians where possible and as required. This will ensure the greatest level of accessibility to the network for all users.

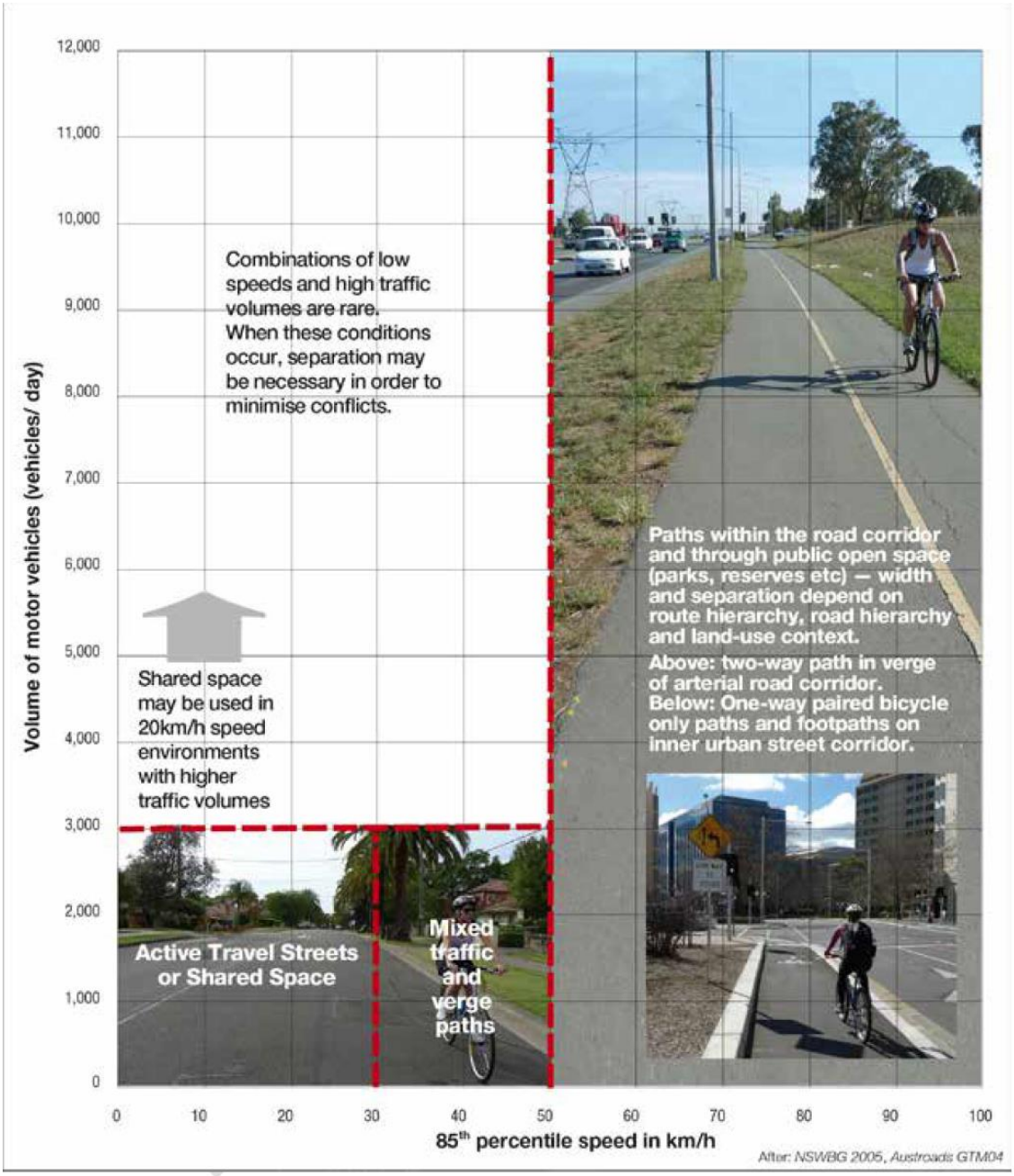
International studies and surveys have noted that the substantial majority of the population prefer to cycle fully separated from traffic, these being the "Interested but Concerned" and likely the "Enthused and Confident" cyclists. However, the "Strong and Fearless" and possibly some "Enthused and Confident" cyclist prefer to cycle on higher speed roads with space in the form of lanes and sealed shoulders (Figure 8.3).

Figure 8.3: Four types of cyclists by proportion of population (Portland, USA)

To assist in understanding how and when separation should occur, Figure 8.4 and Figure 8.5 provides the acceptable thresholds upon which separation is required.

Separation (either for vehicles and cyclists or cyclists and pedestrians) can be considered as "physical separation" such as grade separation, or shared paths separated from road traffic, or cycle only and pedestrian only paths or, "visual separation" through the use of signing and lining.

Figure 8.4: Separation of cyclists and motor vehicles by speed and volume



Source: Draft ACT Guidelines Figure 5.3

Figure 8.5: Separation of cyclists and pedestrians by speed and volume

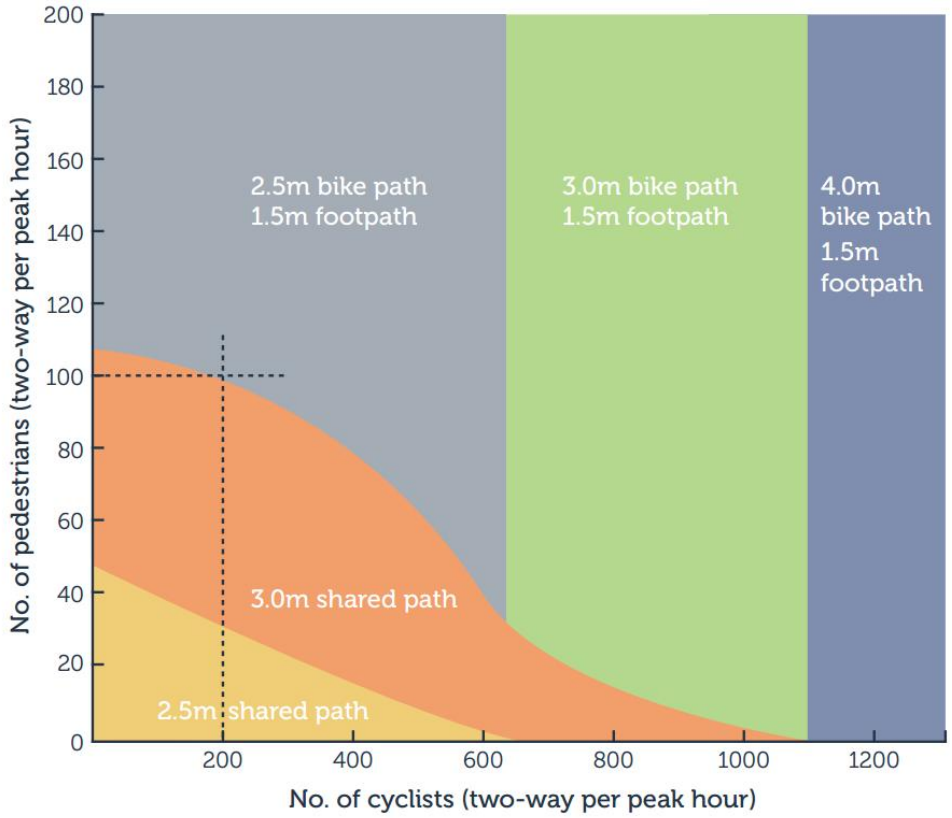


Figure 4 - Path capacity for paths with 50/50 directional.

Source: VicRoads Cycle Note 21.

8.3.1 Land use type and accessibility

Land uses within Kwinana vary between residential areas, semi-rural areas, industrial area and a bushland area. Within the residential and semi-rural areas, the land use can be further broken down into commercial and office areas, retail areas, schools, railway stations and community places.

It is important to identify the land use types existing within the project area before determining the appropriate level of accessibility or the appropriate type of infrastructure for the intended user. Key land use types within the City have been mapped along with the travel distance typically conducive for cycling and walking. This was taken as:

- 3km cycle distance for railway stations
- 1km cycle distance for retail precincts (shopping centres)
- 1km distance for schools (noting High School children can cycle further than 1km), however, the last 1 kilometre is the critical section of a route. Often this is where there is the highest concentration of cars and vulnerable road users.

The mapping in Figure 8.6 to Figure 8.8 provide focus areas for baseline accessibility review of existing infrastructure adjacent key land uses.

The cycling and walking catchment for the two railway stations at 3km are shown in Figure 8.6. It notes that there is a large proportion of residents within acceptable catchment that have the choice of either cycling or walking to either Kwinana or Wellard stations. While there is existing infrastructure within these catchments there are still gaps in the on-road network and an

incomplete off-road network. The existing networks take a person close to the stations but do not deliver the "last mile" for entry into the stations.

The catchment for the retail locations were taken as 1km as shown in Figure 8.7, with 1km being a more realistic distance for cycling or walking demand for local centres. This shows that the majority of the residential area within Kwinana has access to one or more local centres within 1km cycle distance. As with the railway stations, while there is some existing infrastructure within these catchments, there are still gaps in the on-road network and an incomplete off-road network. There is also a lack of cycle parking facilities at some of the centres.

Further to this, improved pedestrian accessibility, particularly for the ageing population, needs to be consider for the immediate surrounding road environment for each retail precinct, including through the precincts.

Catchment for schools within the City of Kwinana area have been mapped as 1km. While research does suggest 2km is an achievable measure, concentration around each school can be a first stage in a wider "Safer Routes to School" operation.

It is evident that through a "Safer Routes to School" program, lowering speeds around schools and improving pedestrian and cycle accessibility and safety, large areas of Kwinana will benefit from an overall improved and safer active transport network. As depicted in Figure 8.7 and Figure 8.8 there is a clear lack of accessibly and infrastructure to the south of Wellard Station and east of the freeway, as well as within the large industrial area to the west.

Figure 8.6: Land use with cycling and walking catchment – railway stations

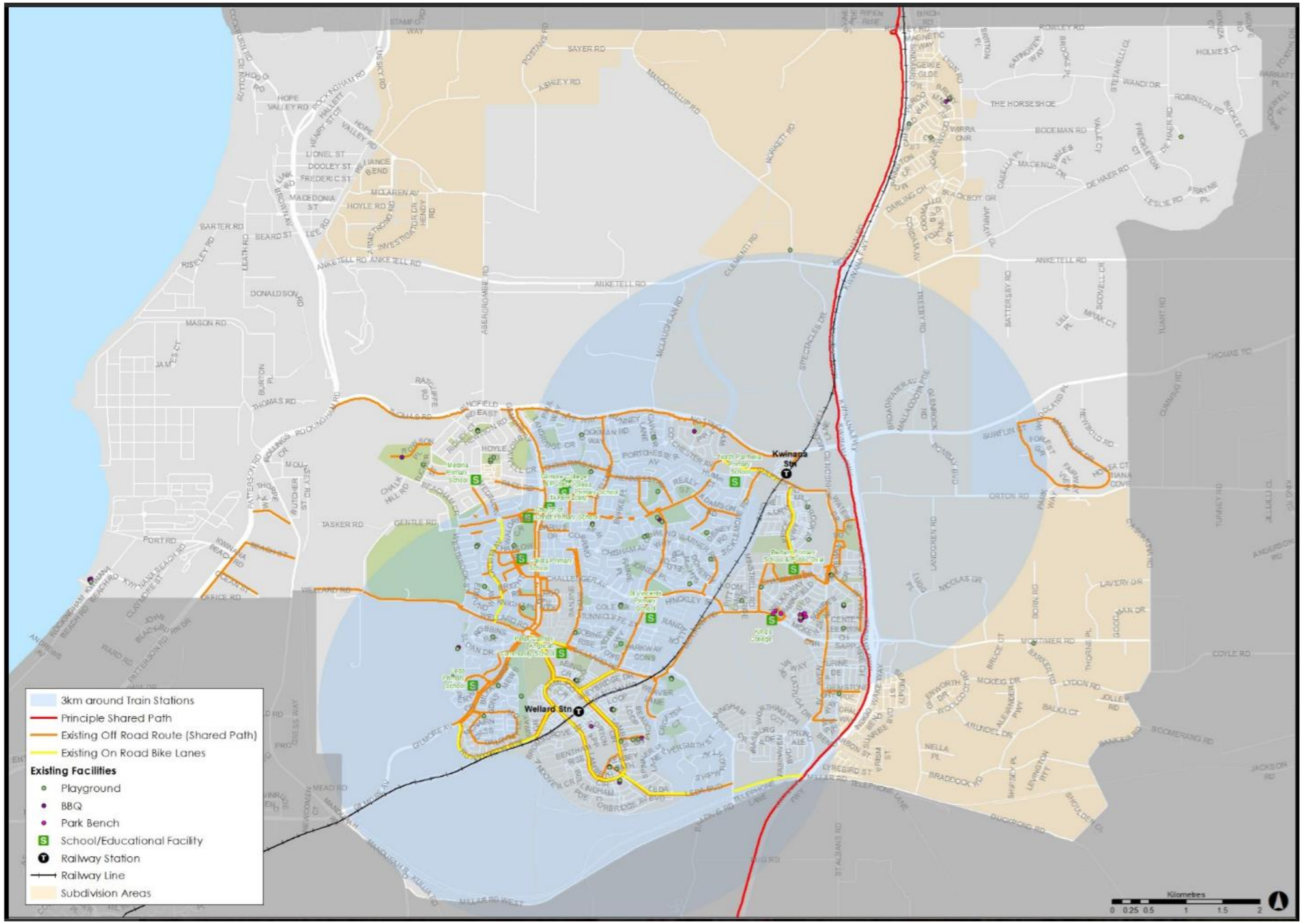


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Figure 8.7: Land use with cycling and walking catchment – retail centres

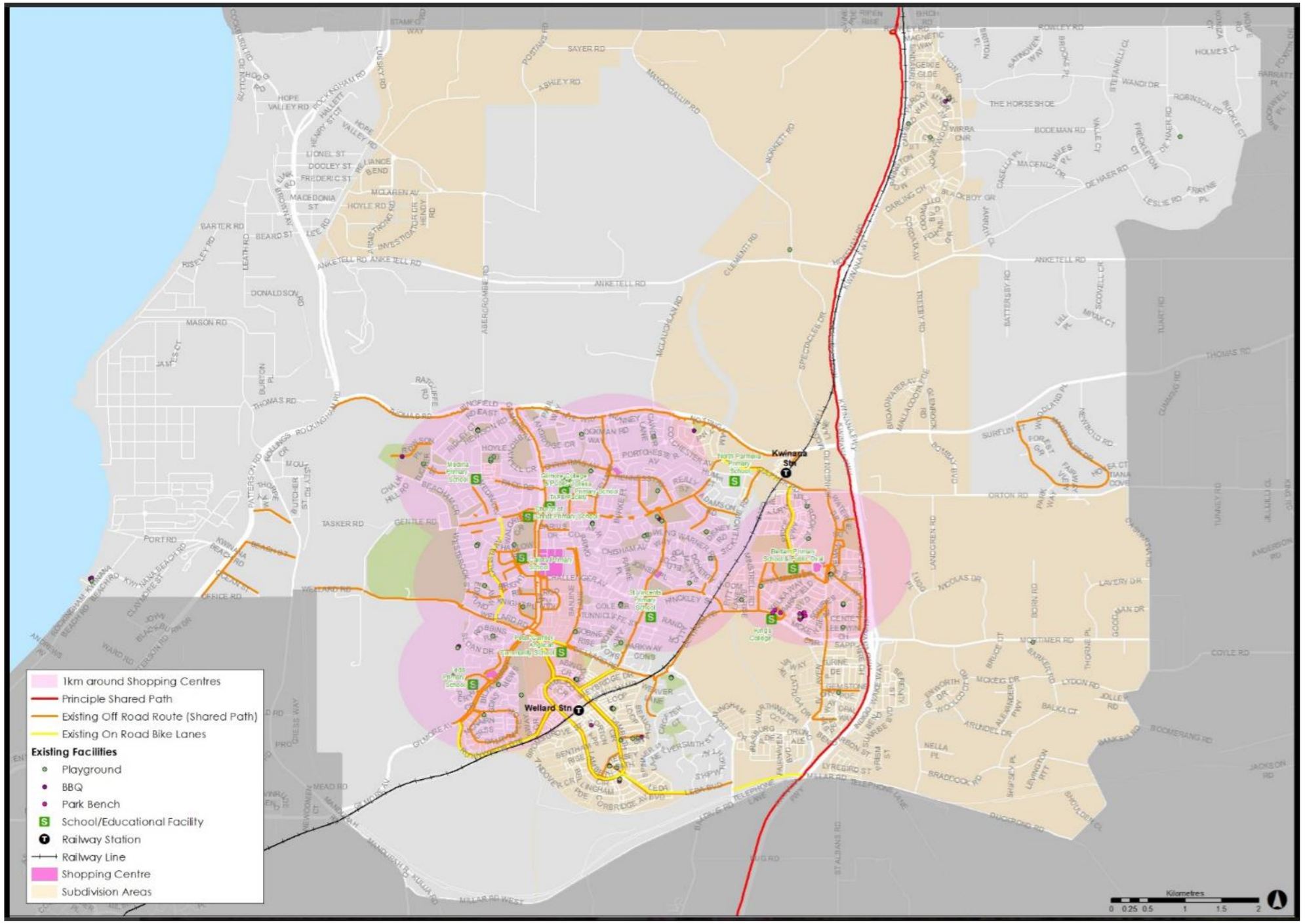

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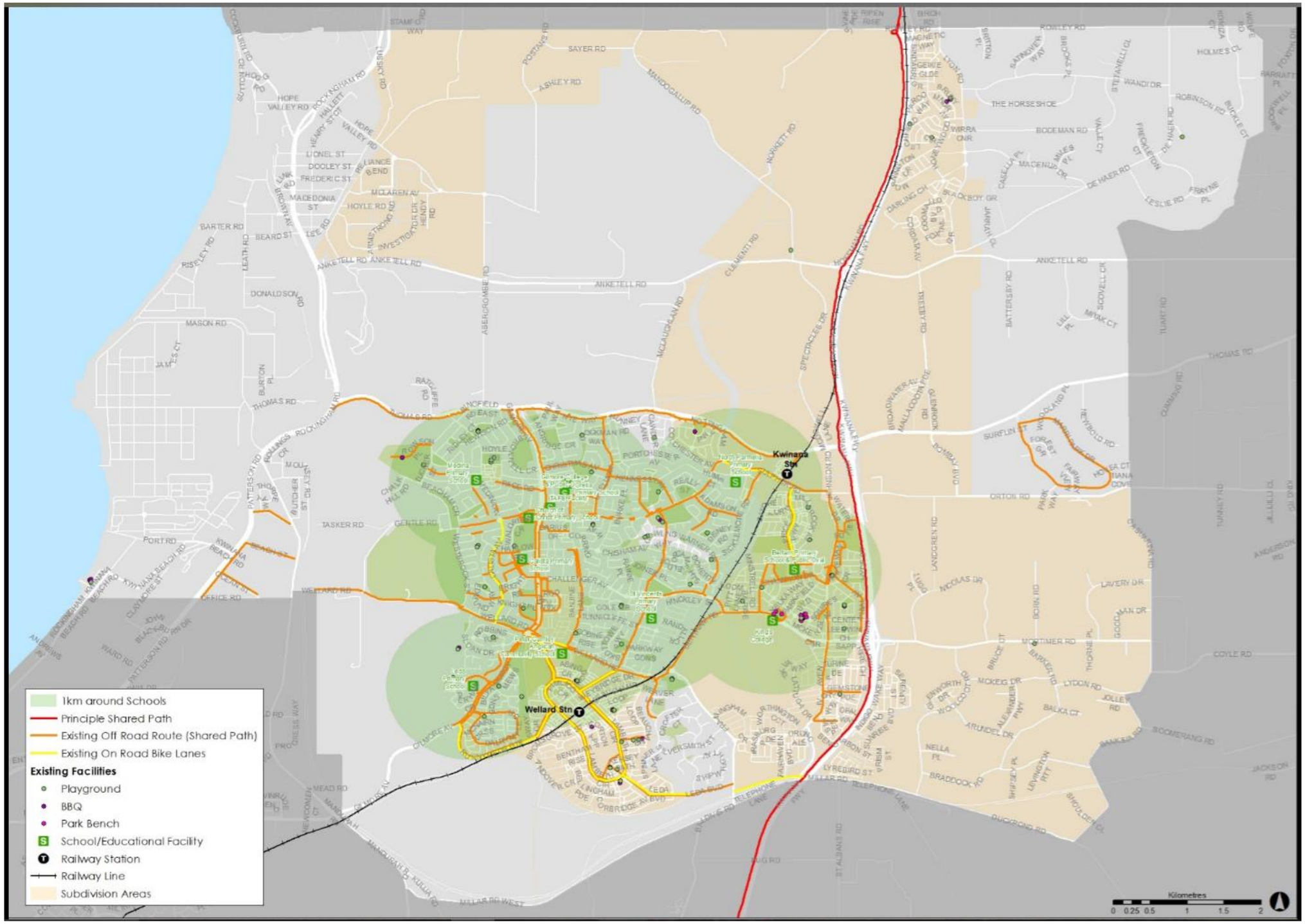
Figure 8.8: Land use with cycling and walking catchment – schools



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9. Regional Network Plan

9.1 The Long-Term Network Plan 2050

The plan has balanced between designing a network that combines the strategic objectives of the State Government for the City of Kwinana's portion of a metropolitan bicycle network, together with the local objectives of a series of neighbourhood plans that are intended to activate the local population to address the serious health challenges of the community.

In the consultation and analysis phases of the plan development, the destinations within the City that have the potential to attract the most people towards cycling and walking, instead of the use of private motor vehicle were determined to be:

- Darius Wells Library & Resource Centre;
- Kwinana Adventure Park;
- Wellard "The Strand" Precinct / Wellard Train Station; and
- Kwinana Train Station.

For the purposes of the secondary network, both Darius Wells and Kwinana Adventure Park are considered as the Kwinana City Centre secondary destination, with routes feeding into either one, based on the direction of the movement. Wellard Town Centre and the Kwinana Train Station are the other secondary destinations. The regional network has been designed to facilitate connections from the surrounding secondary destinations into the destinations above within the City of Kwinana. The surrounding destinations considered in the secondary network are:

- Rockingham Beach, Rockingham City Centre, Rockingham Train Station (Rockingham);
- Coogee, Cockburn Central (Cockburn);
- Armadale City Centre (Armadale); and
- Byford, Mundijong (Serpentine – Jarrahdale).

Local destinations of Hammond Park, Aubin Grove and Baldivis are connected to the City of Kwinana via the local network and need to be reviewed in context of the neighbourhood plan for that area (see section 18). The connection points are shown on the same plan as the connection points with the secondary network (Figure 9.1). Also, of note is the Tramway Reserve Trail project, spanning Yangebup Lake to Karnup and dissecting the City of Kwinana through Mandogalup, The Spectacles, Parmelia, and Providence estate in Wellard.

Primary routes (red) are shown as per the *cycling network* of the Perth and Peel @ 3.5 Million Transport Plan, with the additions being the proposed primary route on the freight line identified as a potential long-term route as well as the proposed Fremantle to Rockingham Controlled Access Highway which is expected to have a high standard principal shared path (Section 9.3).

Thomas Road secondary route is suggested to be shifted to Anketell Road based on community priorities for facilities on Anketell Road and the more direct access to Armadale from the north from Latitude 32 (recognising separated provision will be required). Thomas Road is important for a local context as well as forming part of the Kwinana Loop Trail.

Figure 9.1: City of Kwinana long-term regional cycling network – surrounding destinations

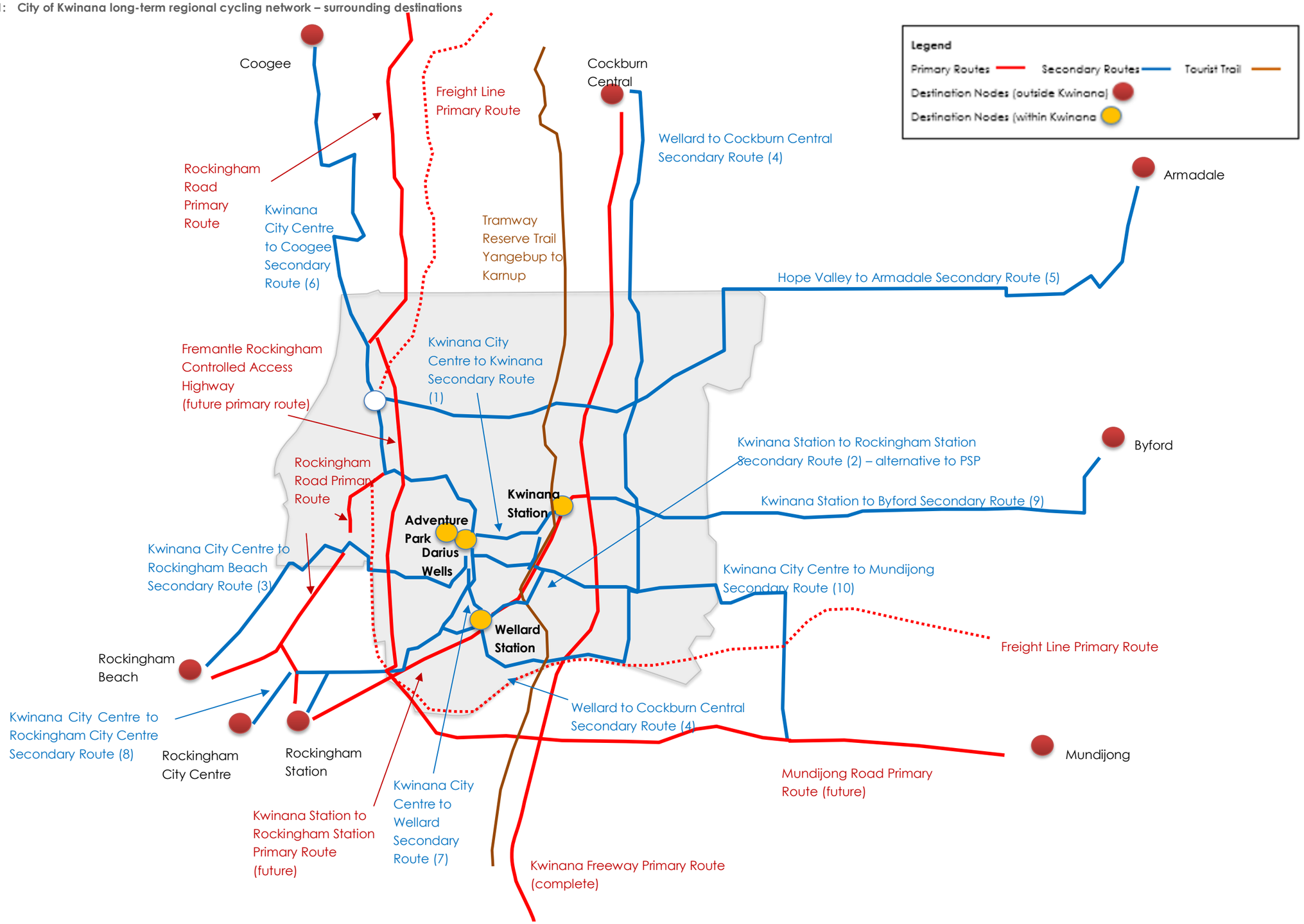

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Figure 9.2: City of Kwinana long-term cycling network – Kwinana

Secondary Route priority for implementation:

1 – **Kwinana City Centre to Kwinana Train Station** (Bicycle boulevard proposed through Parmelia) Note: Sulphur Road is an alternative route between these destinations

2 – **Kwinana Train Station to Rockingham Train Station** (Secondary route alternative – Section 9.4.2)

3 – **Kwinana City Centre to Rockingham Beach** (bicycle boulevard through Calista / Wellard Rd / Beach St / Kwinana Beach Rd / Rockingham Beach Rd)

4 – **Kwinana City Centre to Wellard Town Centre** (Meares Ave / shared path through Abingdon Park / Runnymede Gate)

5 – **Wellard to Cockburn Central** (through new and future developments)

6 -- **Hope Valley to Armadale** (Anketell Rd / De Haer Rd / Rowley Rd – beyond scope of this map)

7 – **Kwinana City Centre to Rockingham Town Centre** (Gilmore Ave largely completed with shared path – Rockingham section to be determined)

8 – **Kwinana City Centre to Coogee** (Gilmore Ave / Thomas Rd / Rockingham Rd / Cockburn Rd)

9 – **Kwinana Train Station to Byford** (Thomas Road / Orton Road – to confirm with Department of Transport and Shire of Serpentine Jarrahdale)

10 – **Kwinana City Centre to Mundijong** (Challenger / Bertram Rd)

The proposed principal route from Kwinana Station to Rockingham Station on the railway reserve is a long-term objective to be built in conjunction with the State Government priorities. In the meantime, an alternative route is proposed as a strategic route option between Sicklemore Rd and Gilmore Ave (shown dashed on the map).

Kwinana Freeway Principal route is completed. Rockingham Rd and the freight line principal routes are long term objectives of the State Government.

9.2 Implementation of the Long-Term Network

The long-term network has been prepared to ensure the City of Kwinana, Department of Transport, land developers and relevant stakeholders are aware of the priority primary and secondary routes for the long term. The extent of works required make it unfeasible to implement the secondary routes in the next 5 years. However, where possible, routes or sections of the routes should be implemented as part of land developments or major projects such as road upgrades.

Primary routes (red) are the responsibility of the State Government and City of Kwinana will advocate for strategic connections to influence the timing of their implementation. However, they form an important part of the overall network and liaison with Main Roads WA and Department of Transport is recommended over the coming years with updates to be incorporated in the next instalment of the bicycle and walking plan for 2023 and beyond, as well as all future bicycle and walking plans. Secondary routes (blue) are the responsibility of the City and consist of a combination of local bicycle boulevard treatments on quiet roads, and shared paths on the busier roads. Individual routes and priorities are detailed in sections 9.3 and 9.4 below.

9.3 Primary Route Network

Six routes have been proposed that will form the primary network to be agreed with the Department of Transport. These routes use major road and rail reserves and will be grade separated in the long term.

Table 9.1: City of Kwinana primary routes

Route	Location	Status
Kwinana Freeway PSP	Freeway reserve	Constructed
Kwinana Train Station to Rockingham Train Station	Rail reserve	Future
Rockingham Road	Road reserve	Future
Kwinana Freight Line	Rail reserve	Future
Fremantle Rockingham Controlled Access Highway	Road reserve	Future
Mundijong Road	Road reserve	Future

9.3.1 Kwinana Freeway Primary Route

The Principal Shared Path (PSP) on the western side of the freeway is complete between Perth City and South Yunderup. The *Perth and Peel @ 3.5 Million Transport Plan* suggests duplication of the primary route on the eastern side from the City down to Rowley Road, the Kwinana boundary, therefore no provision is proposed on the eastern side within the City of Kwinana.

Extensive subdivisional development on the eastern side of the freeway is proposed between Rowley Road and Millar Road and commenced with Honeywood and Sunrise estates. It would be beneficial to implement a shared path on the eastern side, constructed by developers during the subdivisional phase. The path should be 3m red asphalt. Discussion with MRWA and Department of Transport about construction in the road reserve will need to take place. It is likely the path will progress if constructed on private land and crossing the major roads e.g. Thomas Road, Anketell Road, and Rowley Road at grade, in which case the route will more likely be suitable as a secondary route.

RECOMMENDATION 2: Liaise with Department of Transport about long-term priority to construct shared path on east side of freeway (3m red asphalt)

9.3.2 Kwinana to Rockingham Train Stations Primary Route

Due to the train line separating from the Kwinana Freeway to the north of Thomas Road, a primary route is proposed on the rail line to connect the important destinations of Kwinana, Wellard and Rockingham stations.

Any opportunity to construct a portion of the principal shared path adjacent to the rail line should be taken. It is preferred to construct the path on the western side of the railway, but this is not essential and to be considered at the time of construction in consultation with all relevant parties. The opportunity to construct a principal shared path or future proof the alignment for one at the time of the Perth to Mandurah rail construction in 2007 was missed, due to budget constraints. Consequently, the cost of retrofit construction of a principal shared path will be significantly higher and not a priority for the State Government in the short term.

Kwinana Train Station to Rockingham Train Station Strategic Route Alternative

In response to this situation, an alternative on-road alignment is proposed that will form a secondary route between the train stations using adjacent streets. The design of the route between Kwinana Train Station to Rockingham Station is proposed in the implementation plan. Liaison with the City of Rockingham will be required to implement the route in its entirety. The alignment is obvious in its directedness in the City of Rockingham, and a concept has been proposed for discussion with the City of Rockingham and appropriate stakeholders.

9.3.3 Rockingham Road Primary Route

The cost to construct a principal shared path facility in a constrained environment is considerable, especially when a grade separation or structural modification is required. That said, the Rockingham Road alignment is preserved as a primary route and becomes important at least until the Fremantle Rockingham Highway is constructed (see 9.3.4 below). City of Kwinana and Main Roads must coordinate to ensure sections are constructed at opportune times, and where possible, crossings of Rockingham Road be improved. These were mentioned numerous times in the *CrowdSpot* survey, most notably the Thomas Road intersection.

9.3.4 Freight Line and Fremantle Rockingham Highway

While not identified in the cycling network of the *Perth and Peel @ 3.5 Million Transport Plan*, there is opportunity for a primary route along the freight line to be reserved. Due to the uninterrupted nature of these alignments, every opportunity is to be taken to ensure a principal shared path can be constructed. Long-term the demand for pedestrians and cyclists is expected to increase and additional primary routes required. This proposal corresponds with the same recommendation within the City of Cockburn Bike Plan.

The line runs through the industrial area of Hope Valley and behind Kwinana Beach before moving east towards Mundijong to the south of Leda and Wellard. The route will double up the Fremantle to Rockingham Controlled Access Highway primary route, and it is expected there will be some discussion about the need for two primary routes adjacent to each other. The section to the south of Leda and Wellard is the most important as Mundijong Road is not easily accessed from Kwinana. The section to the west of the townsite should be preserved for future decisions to be made.

The Fremantle Rockingham Highway and Mundijong Road future upgrade to extend to Tonkin Highway are noted in the cycling network of the *Perth and Peel @ 3.5 Million Transport Plan* as a primary cycling route and needs to be preserved.

RECOMMENDATION 3: Liaise with Department of Transport about provision of a Principal Shared Path (PSP) on the freight route for the long-term regional cycling network

9.3.5 Local Roads Transferring to Main Roads

MRWA has advised the City of Kwinana that roads once the responsibility of the City of Kwinana will be transferred to MRWA to maintain. Some of these form routes on the primary and secondary network:

- Cockburn Road
- Anketell Road
- Mandurah Road
- Thomas Road
- Mundijong Road

9.4 Secondary Route Network

Ten strategic routes were proposed to cover the regional network to connect key destinations in Kwinana to key destinations of Rockingham, Serpentine-Jarrahdale, Cockburn, and Armadale (Table 9.2). These routes use the road network and represent the blue routes of the Department of Transport regional route hierarchy. These have been prioritised based on the STRAVA data and potential demand to the destinations.

Table 9.2: City of Kwinana secondary cycling routes

Priority	Project	Adjoining Local Government
1	Kwinana Train Station to Kwinana City Centre	-
2	Kwinana Train Station to Rockingham Train Station (alternative route to principal shared path in reserve)	Rockingham
3	Kwinana City Centre to Rockingham Beach	Rockingham
4	Kwinana City Centre to Wellard Town Centre	-
5	Wellard Train Station to Cockburn Central (through new development)	Cockburn
6	Hope Valley to Armadale (Anketell Road and Da Haer Road)	Armadale
7	Kwinana City Centre to Coogee	Cockburn
8	Kwinana City Centre to Rockingham City Centre	Rockingham
9	Kwinana Train Station to Byford	Serpentine Jarrahdale
10	Kwinana City Centre to Mundijong	Serpentine Jarrahdale

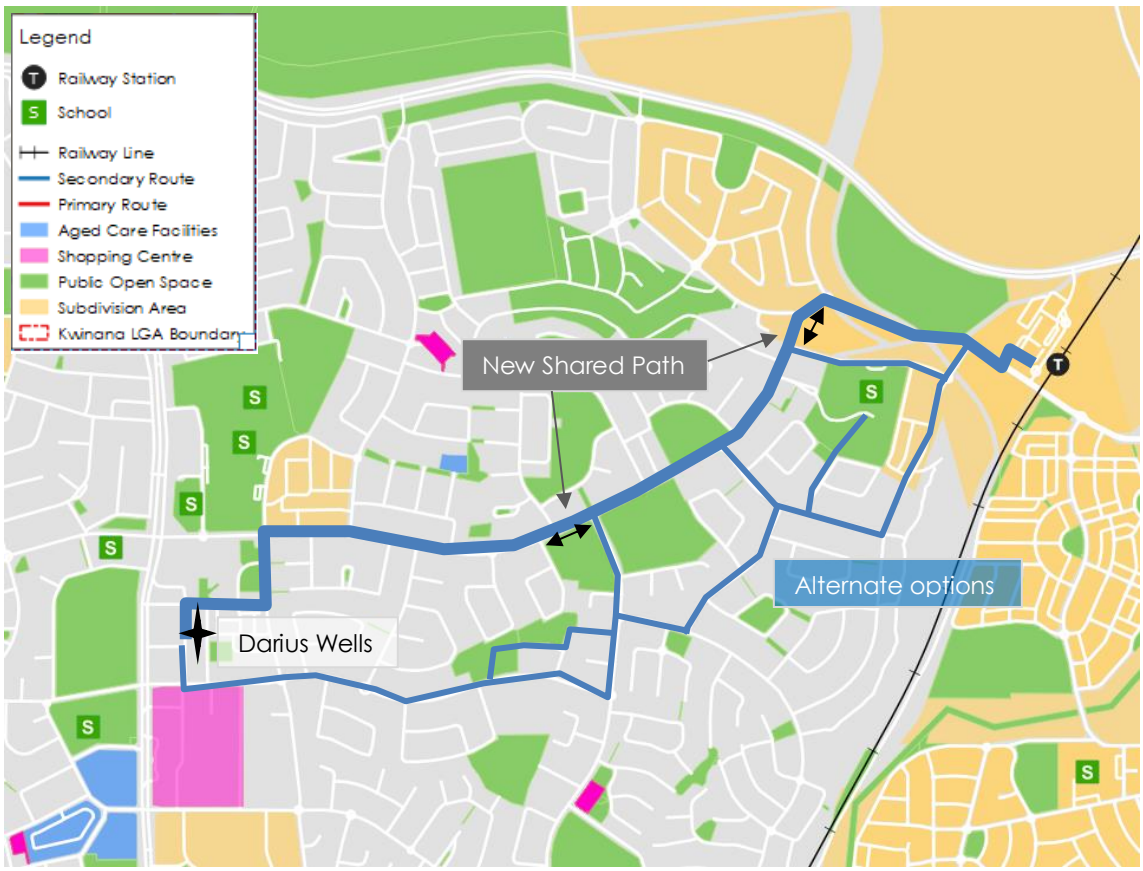
The long-term network priority for the City of Kwinana is to design and implement the secondary routes 1-3, namely:

i Kwinana Train Station to Kwinana City Centre.
ii Kwinana Station to Rockingham Station (road alternative route).
iii Kwinana City Centre to Rockingham Beach.

9.4.1 Kwinana Train Station to Kwinana City Centre

The Kwinana Train Station to Kwinana City Centre (Station to Centre) route is the most important of the secondary routes and links two high profile destinations in the township of Kwinana. Residents in Parmelia and Orelia are expected to benefit from this route which will encourage their travel to the train station and town centre by walking or cycling. Future neighbourhood planning for Parmelia and Orelia should focus on local connections to the secondary route. Instead of adopting one-route alignment, the proposal considers multiple roads in the corridor from the Train Station to the City Centre as some may choose to ride on Sulphur Road, a more direct route but is a bus route with high traffic volumes. Others may choose a more meandering route on Chisham Avenue, Warner Road, Preston, Adamson and Sicklemore Roads. Others again may choose to detour through Hunt Park. Meares Avenue, Parmelia Avenue and Adamson Road provide connections between the main route options. For these reasons, all the routes are shown on the route map (Figure 9.3) with Sulphur Road given the most prominence.

Figure 9.3: Secondary route – Kwinana Town Centre to Kwinana Train Station



This secondary route should be designed with public consultation. It is expected the route will be established with shared paths, bicycle lanes and wayfinding signage as the first phase, and the desirable treatments of bi-directional cycle lanes and local boulevard treatments explored for enhancement in future phases. As with secondary routes that use the local street network in other parts of Perth, *Safe Active Street* principles to prioritise bicycle and pedestrian movement should be explored. These include 30km/hr traffic speeds and restricted forward visibility (e.g. Shakespeare Road, North Perth). Items proposed for the secondary route from Kwinana Train Station to Kwinana City Centre (Station to Centre) are provided in Table 9.3.

Table 9.3: Secondary route implementation projects (Station to Centre)

Item	Project
S1-1	Meares Avenue shared path (east side Sulphur Road to bicycle lane)
S1-2	Sulphur Road bicycle lane (westbound Nottingham Parkway to Durrant Avenue)
S1-3	Sulphur Road bicycle (westbound Parmelia Avenue to Kirkland Way)
S1-4	Pavement marking access roads (bicycle stencils)
S1-5	Chisham Avenue bi-directional lane (north side Meares Avenue to Parmelia Avenue
S1-6	Path upgrade through Hunt Park (Chisham Ave to Hunt Place)
S1-7	Bicycle boulevard treatment Hunt Place and Cowling Way)
S1-8	Upgrade crossings of Parmelia Avenue at Chisham Avenue and Cowling Way (raised plateau crossings)
S1-9	Parmelia Avenue bi-directional lane (east side Chisham Avenue to Sulphur Road
S1-10	Warner Road shared path (south side Parmelia Avenue to Sicklemore Road)
S1-11	Bicycle boulevard treatment Sickelmore Road and Preston Road (entire lengths)
S1-12	Adamson Road shared path (north side entire length)
S1-13	Optional: Connection to North Parmelia Primary School to be explored through liaison with school and residents (local bicycle boulevard or shared path treatment on Dawson Way and path upgrade and lighting between Dawson and school)
S1-14	Liaise with PTA to remove car parking on shared path on Sulphur Road at station (bollards and or enforcement)

It should be noted that bicycle lanes without protection are no longer supported by the Department of Transport and are proposed here as an interim measure for consistency. Wayfinding signage should be adopted for the route according to the principles outlined in Chapter 19.4.

Bicycle stencils on the access roads to Sulphur Road (item SI-4) are important to indicate to people cycling the designated route alignment and to alert car drivers of the presence of cyclists and prominence of the route. These should be spaced at 200m intervals and face the direction of traffic westbound and eastbound of the adjacent Sulphur Road lane.

Figure 9.4: Sulphur Road access road bicycle stencil locations

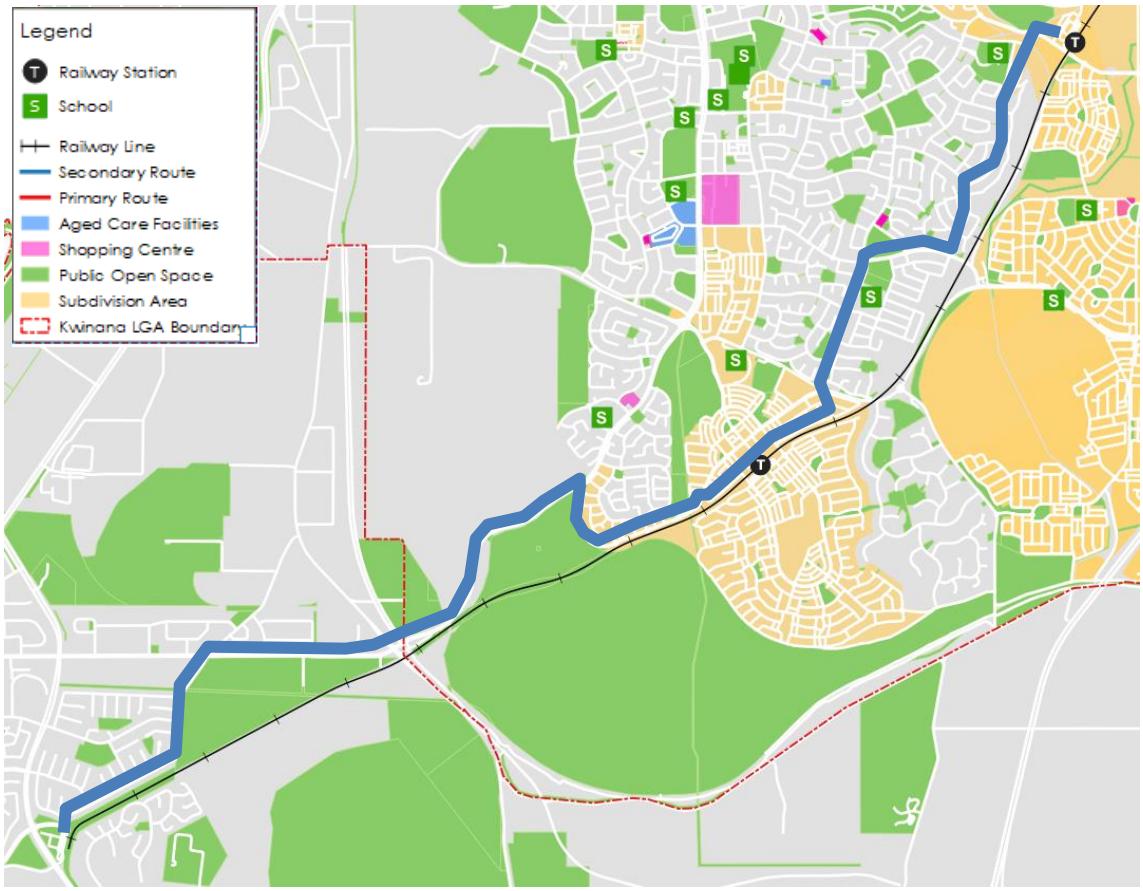
Transitions between the access roads should be designed to enable the safe cycle movement between them but deter car movements known as 'Filtered Permeability'. The Sulphur Road route should consider pavement marking treatments to the existing environment and signage to indicate the destinations of Kwinana City Centre and Train Station, and treatments to distinguish between on-road shoulder and the access road and paths used (detailed further in Section 19.3). Similar treatments have been used on South Terrace in Fremantle.

9.4.2 Kwinana Train Station to Rockingham Train Station

As mentioned in Section 9.3.2, the expected construction of the primary route on the rail line between Kwinana, Wellard and Rockingham is not likely for some time, therefore, an alternative route is proposed using the road network.

This secondary route has been indicated on Figure 9.5 below and should be developed in conjunction with the City of Rockingham, with treatments considered based on consultation with residents and neighbourhood community groups.

Figure 9.5: Secondary route – Kwinana Train Station to Rockingham Station



The total route is about 12km and a 45min bike ride. The section within Kwinana between Sulphur Road and Wellard Road is shown in Figure 9.6 and the section between Wellard Road and Gilmore Avenue is shown in Figure 9.7.

Figure 9.6: Secondary route – Kwinana Train Station to Wellard Road (Stage 1)

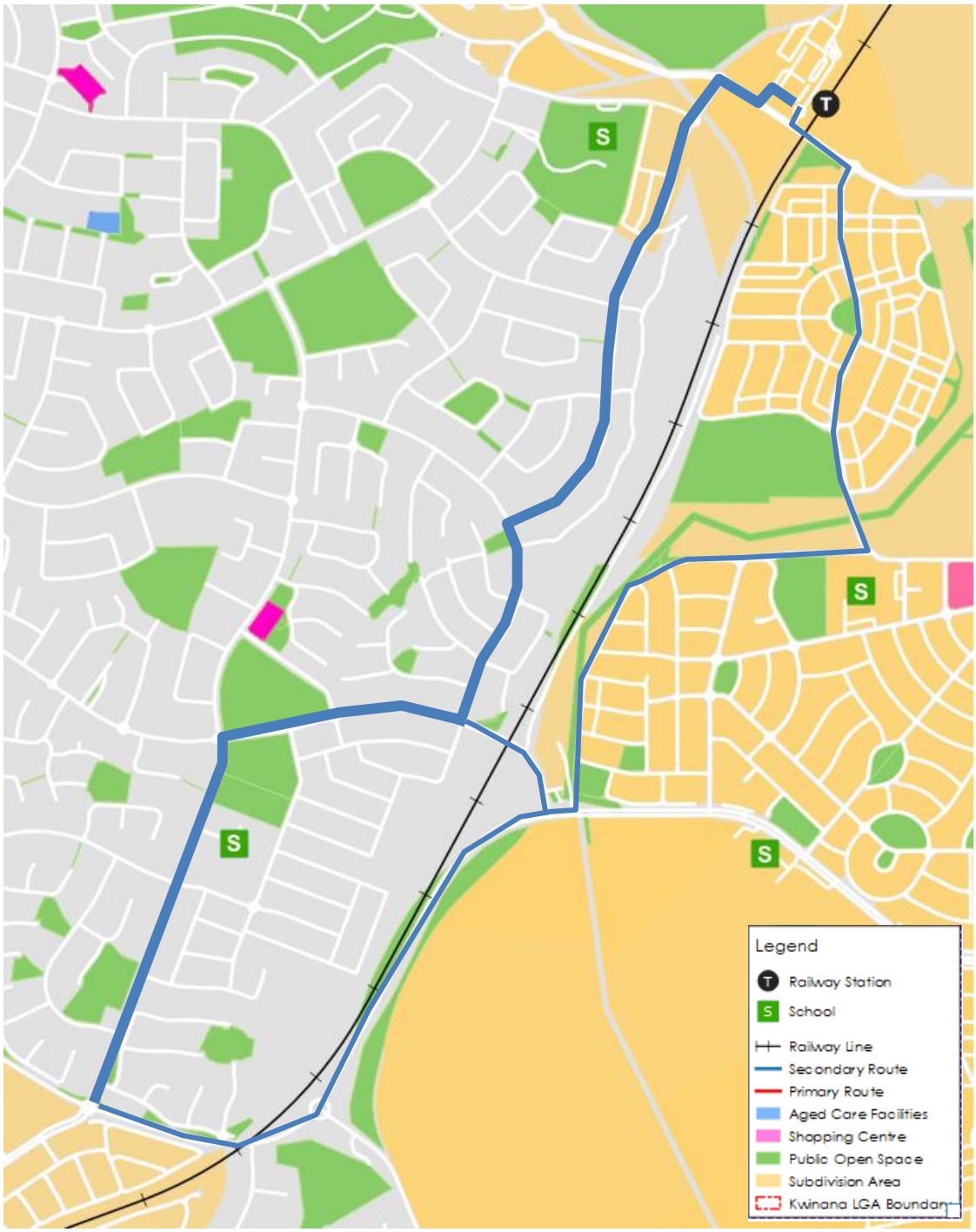
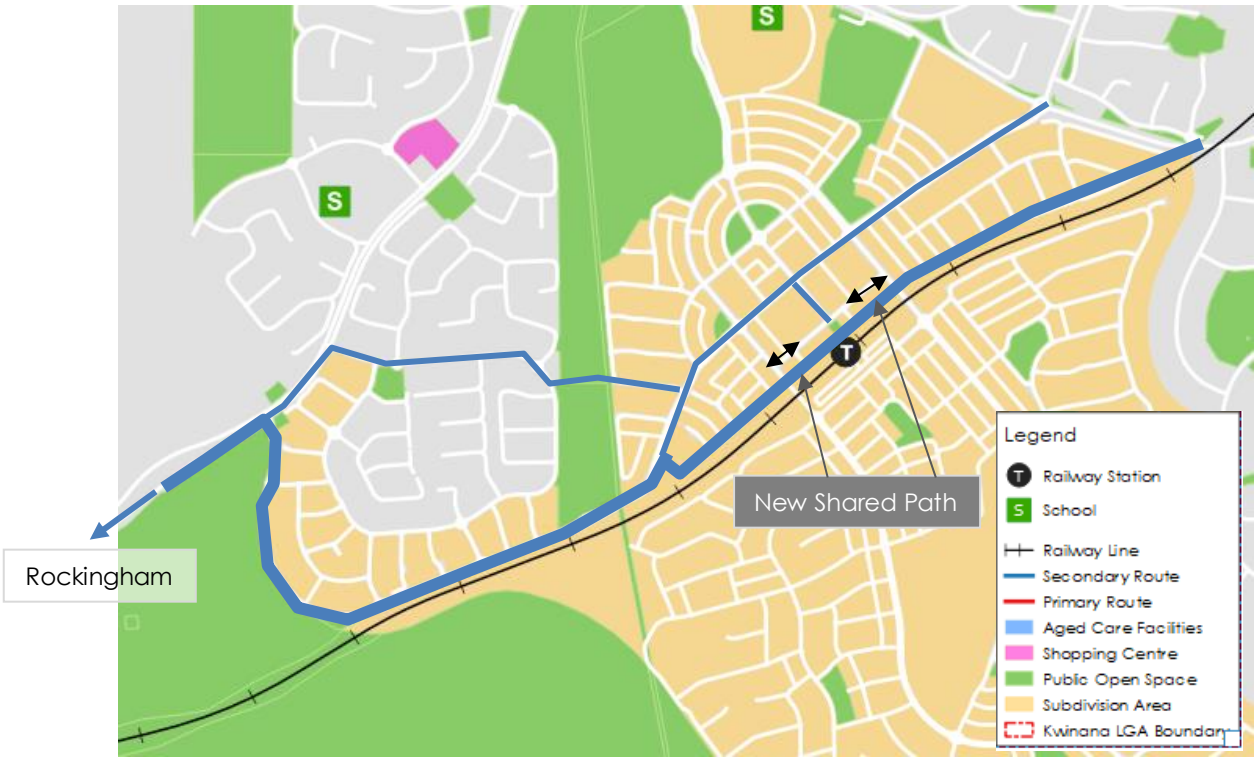


Figure 9.7: Secondary Route – Wellard Road to Gilmore Avenue (Stage 2)



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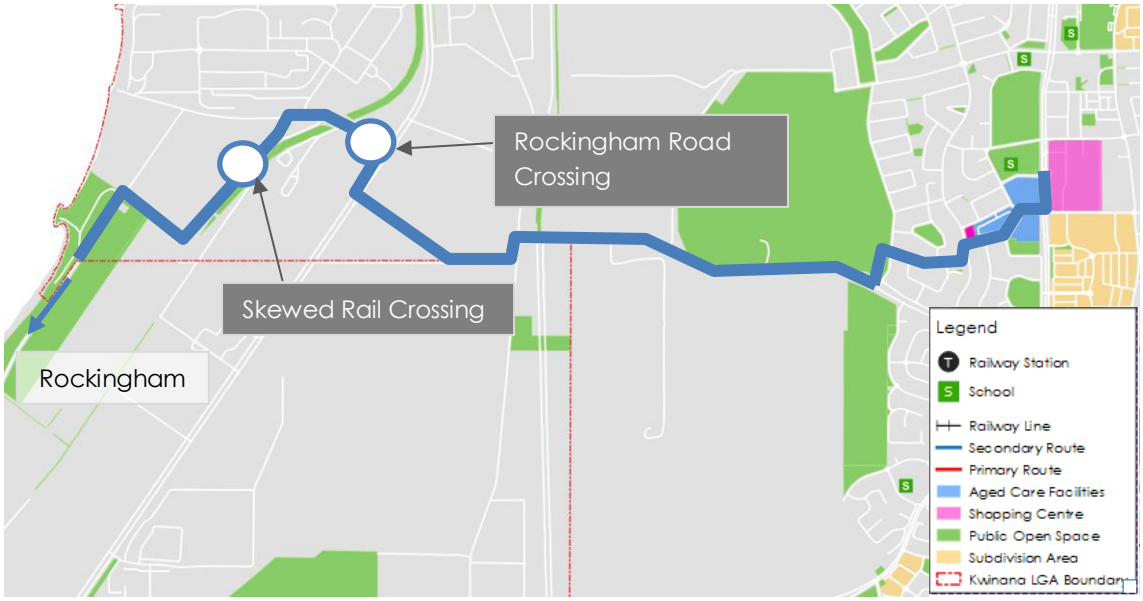
9.4.3 Kwinana to Rockingham Beach

One of the most popular routes in the STRAVA heat map (Figure 5.1) is noted as Rockingham Beach and along Wellard Road into the City Centre from the western side. Due to the limited number of entry points into Kwinana, this route becomes particularly important. For that reason, it is proposed to be designed in the implementation program and constructed as funding allows.

The route between the City Centre and Rockingham boundary is shown in Figure 9.8. The exact route through Calista should be explored with consultation and consider low speed boulevards on the internal road network as well as the direct route on the Wellard Road shared path.

Figure 9.8: Secondary route – Kwinana Town Centre to Rockingham Beach

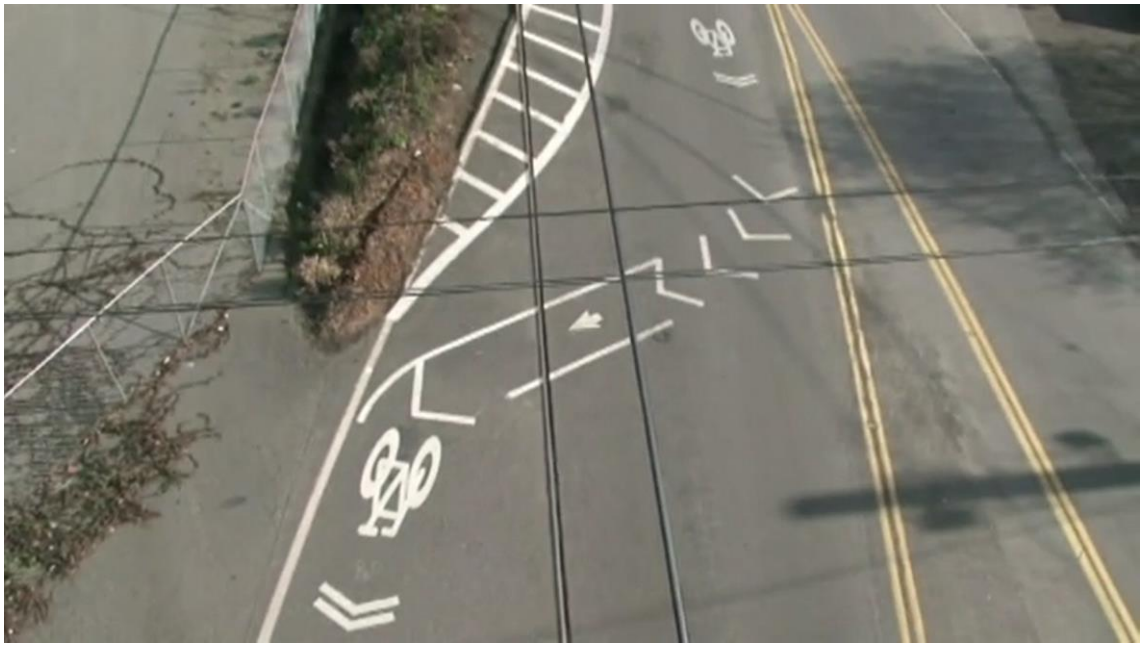


One of the key issues of this route is the crossing of the freight rail tracks on Kwinana Beach Road that run at an angle to the road and are slippery under wet conditions (Figure 9.9). There is a similar situation on Railway Parade in Bassendean where numerous accidents have occurred. This will need to be addressed for safety of the route when it is promoted. International best practice indicates pavement marking to encourage movement at 90 degrees is suggested (Figure 9.10). This would mean Kwinana Beach Road should be widened to encourage this movement to occur outside the road carriageway.

Another issue is the crossing of Rockingham Road itself which will need to involve significant modification, and consultation with MRWA. Appropriate protection with pedestrian and cycling lanterns at traffic signals should be provided.

Figure 9.9: Kwinana Beach Road angled rail crossing

Figure 9.10: Rail angled crossing treatment example



9.4.4 Kwinana City Centre to Wellard Neighbourhood Centre

This north-south secondary route is proposed to connect two important centres in the City. It is not proposed for design in the implementation plan, to allow for the previous three routes to progress, however, opportunities should be taken whenever roads are modified.

Route options include a western option on Gilmore Avenue to Henley Boulevard, and an eastern option on Meares Avenue and Abingdon Park (Figure 9.11). The route should provide connections to Kwinana Adventure Park on the western side of Gilmore Avenue. One of the challenges is the crossing of Wellard Road. This was raised in the consultation phase as being particularly difficult at the roundabout with Meares Avenue with the volume of cars being used to drop students to the Peter Carnley Anglican Community School.

Figure 9.11: Secondary route – Kwinana Town Centre to Wellard Town Centre

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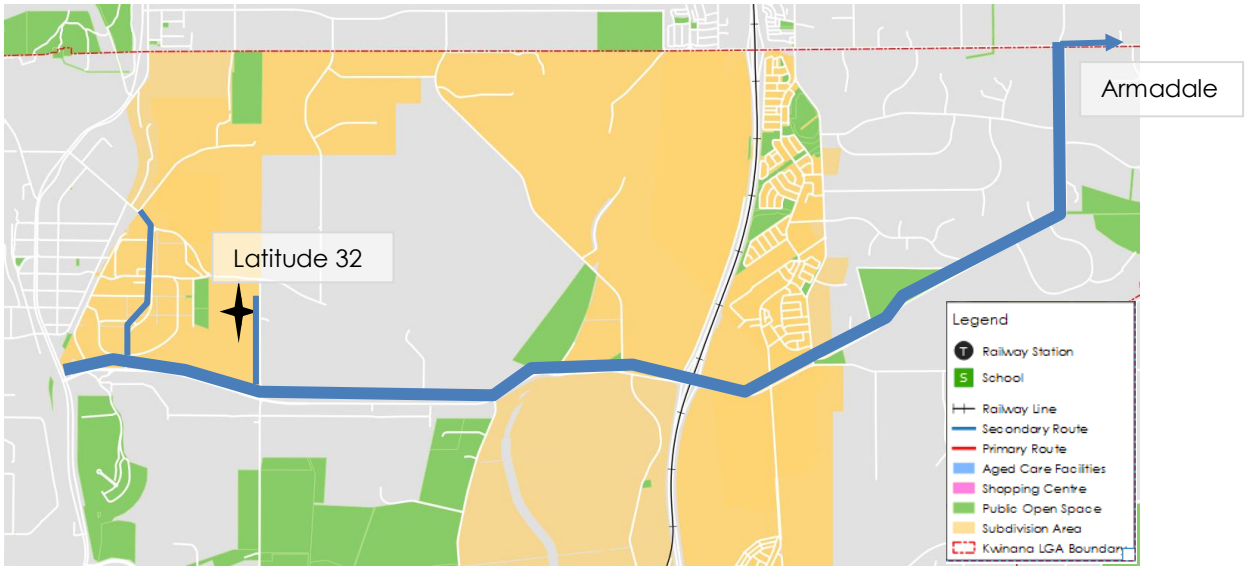
9.4.5 Hope Valley to Armadale

This east-west secondary route runs in the north of the City of Kwinana and will form the main arterial cycle route for new developments in this region. This route will also provide connection to the Kwinana Industrial Area and Latitude 32 (Figure 9.12).

Figure 9.12: Secondary route – Hope Valley to Armadale



There is demand for the route on Anketell Road, as indicated in *CrowdSpot* (Table 6.1). De Haer Road was also picked up in the *CrowdSpot* consultation as a road used for cycling that needed improvements for safety. Anketell Road is proposed to become a MRWA asset, meaning construction of the proposed facility on Anketell Road for this secondary route will be largely outside the City's control. However, the City should ensure the facility has adequate provision at the time of upgrades and highlight the routes role and demand in the community.

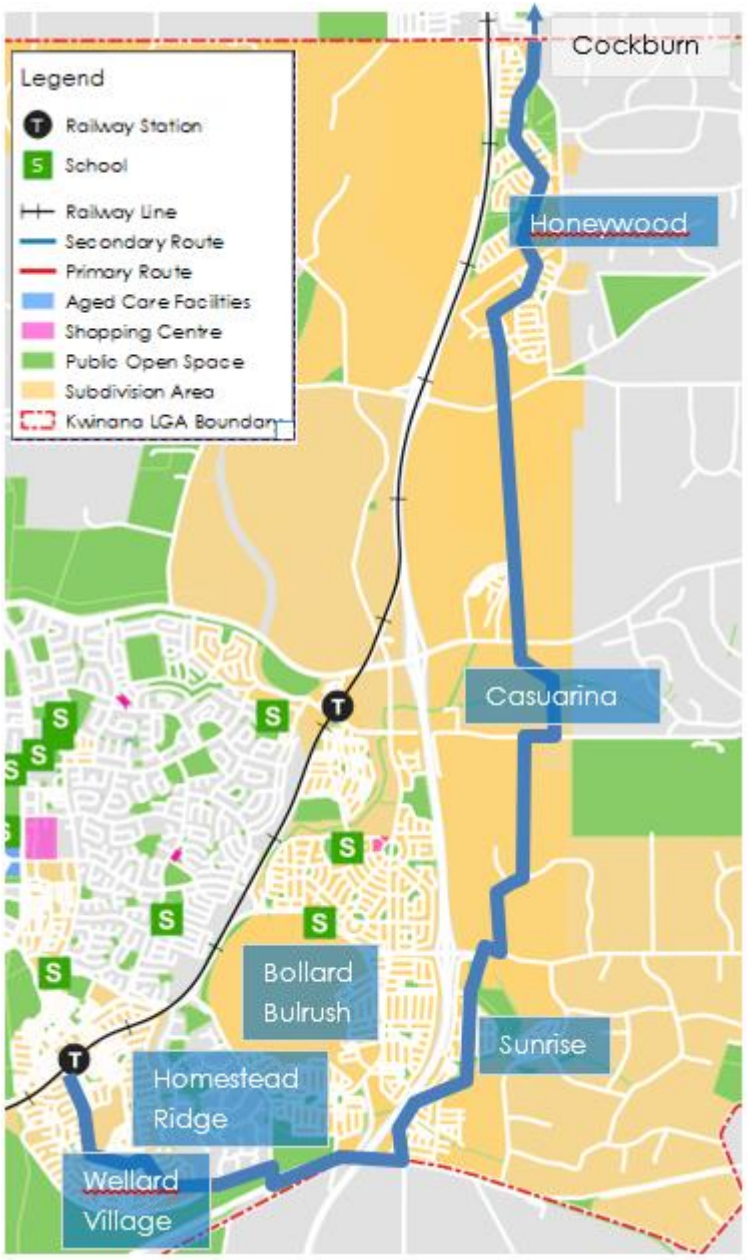
The industrial areas of Kwinana Beach and Hope Valley (Latitude 32) are frequently accessed destinations within the City of Kwinana, and strategic from an overall transport perspective. This route will provide connection to these destinations, and to the north-south primary routes on Rockingham Road and the future Controlled Access Highway and Freight Line primary routes. The north-south Tramway Reserve Trail and potential trail on the Dampier Bunbury Natural Gas Pipeline alignment (Sections 9.5 and 9.6 respectively) also dissect this secondary route.

It is not proposed to construct works items to establish this route in the implementation plan, but opportunities should be taken as part of developments or road upgrades to ensure adequate cyclist provision through a principal shared path on Anketell Road, and a shared path or bi-directional cycling facility on De Haer Road. The connection to Honeywood estate on Wandi Road is proposed in the long-term network as part of works on De Haer Road to ensure the link is effective to link the new populations close to the freeway. These are proposed beyond the implementation plan to form part of the long-term network.

9.4.6 Wellard Train Station to Cockburn Central

This secondary route is actually a series of local routes. People travelling to Cockburn Central are likely to do so on the Kwinana Freeway, but people accessing destinations on the east will need a north-south route. This route will run through the future residential areas situated on the eastern side of the freeway from Wellard through to Honeywood, and eventually connect to Cockburn Central using the cycle network through Atwell. The western part of the route from Wellard to the Kwinana Freeway uses Lambeth Circle and Leda Boulevard. It is expected to provide connections to Homestead Ridge from this route, as well as the developments in Baldivis to the south. This route would need to be developed as part of the subdivisional development on the eastern side of the freeway from Wellard East subdivisions through to Honeywood estate, and eventually connect to Cockburn Central using the City of Cockburn's Lyon Road through Atwell.

Figure 9.13: Secondary route – Wellard to Cockburn Central (entire route)



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The western part of the route from Wellard to the Kwinana Freeway uses Lambeth Circle and Leda Boulevard. It is expected to provide connections to Homestead Ridge from this route, as well as the developments in Baldivis to the south (in the City of Rockingham).

Figure 9.14: Secondary route – Wellard to Cockburn Central (Wellard to Freeway)

9.4.7 Kwinana City Centre to Coogee

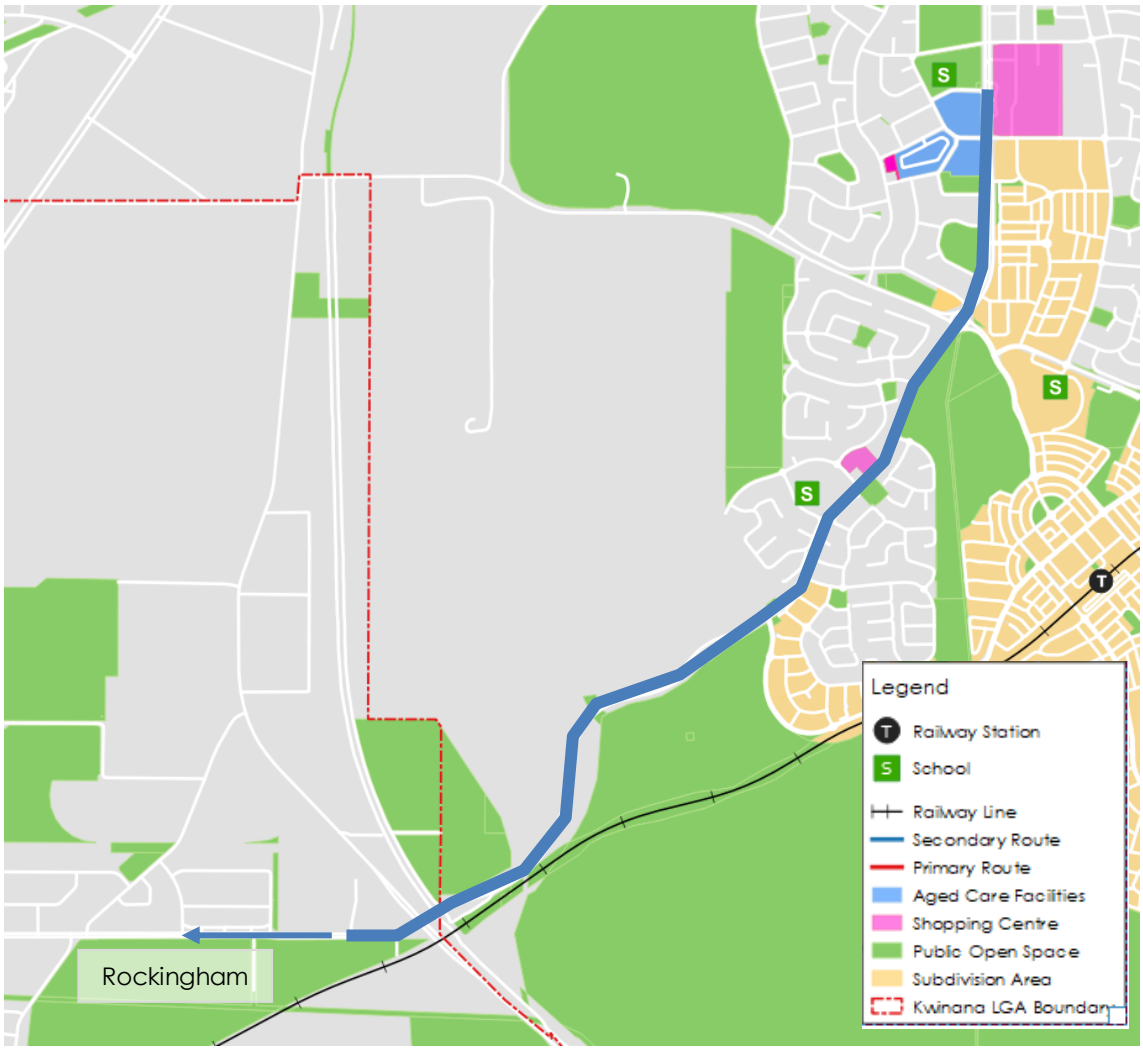
The north-south secondary route is an off-road route using Gilmore Avenue, Thomas Road, Rockingham Road (Thomas Road to Cockburn Road), and Cockburn Road (Figure 9.15). This route is expected to ultimately link up with the coastal recreation path north of Coogee to Fremantle and provides an off-road link into Kwinana from the coastal areas to the north of the City.

Figure 9.15: Secondary route – Kwinana to Coogee

9.4.8 Kwinana City Centre to Rockingham City Centre

While the more popular route to Rockingham is via the foreshore (see Section 9.4.3), a secondary route is proposed to connect the Kwinana City Centre from the Rockingham City Centre (shopping centre). This route is also off-road and uses Gilmore Avenue and Dixon Road. The exact alignment into Rockingham will require consultation with the City of Rockingham and Department of Transport. Note some overlap between this route and the secondary route between Kwinana Train Station and Rockingham Train Station (see Section 9.4.2) exists.

Figure 9.16: Secondary route – Kwinana to Rockingham City Centre



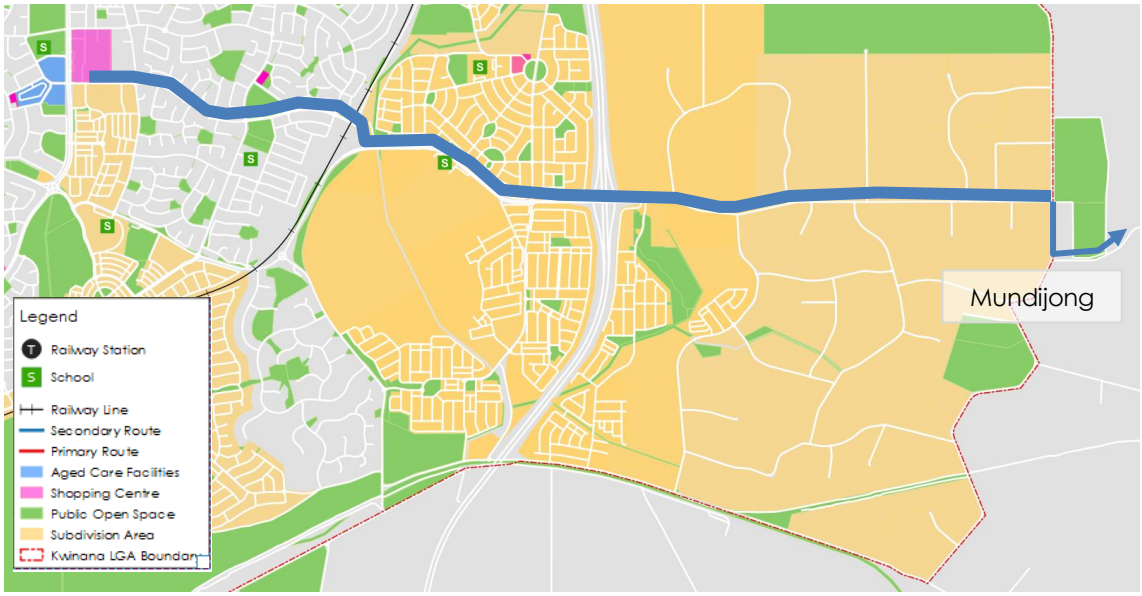
9.4.9 Kwinana Train Station to Byford

Using the shared path facilities on the Thomas Road overpass of the Kwinana Freeway, a secondary route is proposed east towards Byford. Further consultation between the City and the Shire of Serpentine Jarrahdale and Department of Transport is required regarding the alignment of this route, with Thomas Road requiring a principal shared path, and Orton Road providing a more direct connection into Byford on a low volume but high-speed road.

9.4.10 Kwinana City Centre to Mundijong

Another east-west secondary route connects Kwinana City Centre to Mundijong via Challenger Road, Bertram Road and Mortimer Road (Figure 9.17). Connecting to Mundijong itself will require additional consultation with the Shire of Serpentine-Jarrahdale and Department of Transport.

Figure 9.17: Secondary Route – Kwinana to Mundijong (Coyle Road)



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9.4.11 Secondary Route Network Implementation

The long-term network has been prepared to ensure its objectives are on track for future instalments of the plan, as well as to ensure road improvement projects and developments incorporate the ultimate network design and opportunities to construct the network are not missed.

Limited funds are available in the City of Kwinana's annual budget and the primary focus of the plan is establishing local 'neighbourhood' networks that address well known hotspots or missing links identified as barriers to cycling and encourage short 1-2km trips for cycling for health. For the secondary network it is proposed to proceed with three routes with specific items of the Kwinana Station to City Centre route separated in Table 9.4 and Table 9.5.

Table 9.4: City of Kwinana secondary route plan (design)

Priority	Project
S1	Design of Kwinana Train Station to Kwinana City Centre secondary route
S2	Design of Kwinana Train Station to Rockingham Train Station secondary route as an alternative route to railway line PSP
S3	Design of Kwinana City Centre to Rockingham Beach secondary route together with City of Rockingham

Table 9.5: City of Kwinana strategic route implementation plan (Station to Centre)

Priority	Project
S1-1	Sulphur Road – 180m bicycle lane (westbound Nottingham Parkway to Durrant Avenue)
S1-2	Sulphur Road – 180m bicycle lane (westbound Parmelia Avenue to Kirkland Way)
S1-3	Pavement marking on all access roads (bicycle stencils)
S1-4	Chisham Avenue – 1.1km bi-directional lane (north side Meares Ave to Parmelia Ave)
S1-5	Path upgrade through Hunt Park (Chisham Ave to Hunt Place)
S1-6	Safe active street (SAS) treatment – 420m on Hunt Place and Cowling Way
S1-7	Upgrade crossings of Parmelia Avenue at Chisham Avenue and Cowling Way (raised plateau crossings)
S1-8	Parmelia Avenue – 650m bi-directional lane (east side Chisham Avenue to Sulphur Road)
S1-9	Warner Road – 650m shared path (south side Parmelia Avenue to Sicklemore Road)
S1-10	Safe active street treatment – 1.5km Preston Road, Adamson Road (east of Preston), Sicklemore Road (north of Adamson)
S1-11	Adamson Road – 300m shared path (north side Sulphur Road to Preston Road)
S1-12	Optional: Connection to North Parmelia Primary School to be explored through liaison with school and residents (local bicycle boulevard or shared path treatment on Dawson Way and path upgrade and lighting between Dawson and school)
S1-13	Liaise with PTA to remove car parking on shared path on Sulphur Road at station (bollards and or enforcement)

Total: 1.9km Safe Active Street; 1.75km bidirectional lane; 950m shared path; 360m bicycle lane (one-way)

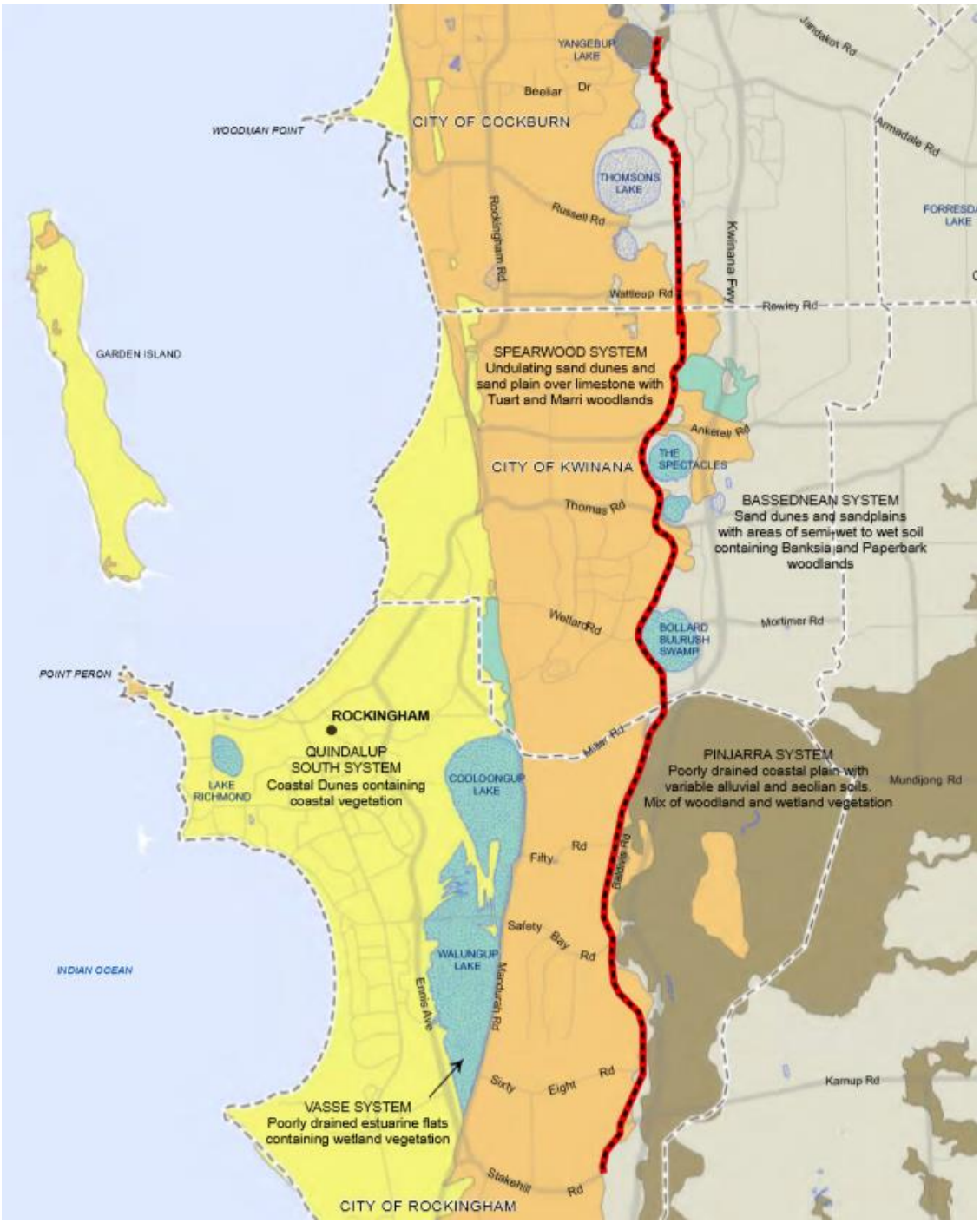
RECOMMENDATION 4: Implement Kwinana Train Station to Kwinana Town Centre secondary route in the implementation plan

RECOMMENDATION 5: Implement Kwinana Train Station to Rockingham Train Station secondary route in the implementation plan subject to Department of Transport funding (City of Kwinana section)

9.5 Trails Network

In addition to the Kwinana loop trail (Figure 7.5) is the Tramway Reserve Trail running between Yangebup Lake in City of Cockburn to Karnup in City of Rockingham. Sections of the trail in Kwinana utilise the Kwinana Loop Trail alignment, while the portion north is important in its connectivity to Cockburn between the Spectacles and the proposed Mandogalup development. One of the key stakeholders in this trail is the South West Group.

Figure 9.18: Tramway Reserve Trail



9.6 Opportunities – Dampier Bunbury Gas Pipeline

Another opportunity presents itself with the Dampier to Bunbury Natural Gas Pipeline that runs through the City of Kwinana to the west. Further discussion should be had between the City and the Dampier Bunbury Pipeline company to see whether trails could be constructed, particularly in the northern section that runs from Honeywood estate and could connect to a shared path on the eastern side of the freeway in the long term (note: not identified in the Perth Transport Plan).

While no recommendations for the development of this route has been provided within this plan, it should be considered in subsequent cycling and walking plans, to not lose the opportunity if it becomes available, and the authority seeks to activate the area and gain positive community publicity.

Maps of the pipeline alignment are provided in Appendix D.

10. A Neighbourhood Cycling and Walking Strategy

10.1 Background

Kwinana developed in the 1950s has four neighbourhood zones, Medina, Calista, Parmelia and Orelia. Designed by Margaret Feilman, Perth's first female town planner[6], Kwinana was designed as a garden city, utilising the landscape and topography to connect people within the neighbourhoods. The residential zones were separated from Kwinana's industrial complex by parkland and open spaces.

Kwinana was considered at the time to be a triumph in concept and design, and became Australia's prototype for the future under the new town model of development. Feilman intended to create an Australian town in an attractive landscape, reporting herself that, "a social life with its own organisations is already functioning and has given a very real community identity to the town, which is essentially a social experiment."

It is therefore highly appropriate that now Kwinana is adopting a neighbourhood community model, an innovative approach to carrying out the cycling and walking plan.

The development of Kwinana was built largely by the State Housing Commission which saw Kwinana as vital to the industrial development of the state of Western Australia. The government planned for a town for a population of 40,000[7]. Currently the population is 40,300 according to official ABS data for 2016 (http://profile.id.com.au/kwinana/population-estimate). It is therefore at a pivotal time where Kwinana is moving beyond where its early planners envisaged in terms of its size and scope, with forecasts of 84,000 within 20 years predicted[8] (Appendix B).

Nearly 70 years on, the City has developed with Leda, Wellard and Bertram being the prominent suburbs that have been built, with Wellard undergoing significant expansion. New developments are now also springing up over the eastern side of the freeway and northern part of the City.

With the recognised health concerns of the community, the fact physical exercise of 1-2km cycling and walking trips can address them, and the opportunity available due to the way Kwinana has been planned with community in mind, this neighbourhood plan has the potential to be the beginning for a long-term strategy of creating active, healthy, well connected Kwinana communities.

[6] Margaret Fielman (1921-2013), https://web.archive.org/web/20131021091120/http://www.nationaltrust.org.au/wa/MargaretFeilman
[7] Practicing Utopia: An Intellectual History of the New Town Movement (page 59) Rosemary Wakeman
[8] Figure 5, Hames Sharley Report (page 17)

10.2 The Neighbourhoods

This unique attribute of the City of Kwinana, along with the fact residents have serious health concerns where active travel can be a solution, has formed the basis of this Bike and Walk Plan.

The City is rare in metropolitan Perth. Hidden within the south west portion of the State's capital with clearly definable boundaries, there are limited access points, Kwinana is surrounded by bushland that contains a Loop Trail with historical significance. Significant undeveloped land forms a natural buffer zone from the Kwinana Industrial Area.

The following neighbourhood plans are focused on the destinations that bring the community together such as known popular parks and reserves, shopping centres, community centres, as well as local schools. The plan also seeks to connect the neighbourhoods to the Kwinana Loop Trail and help activate in the minds of the communities what they have available to them.

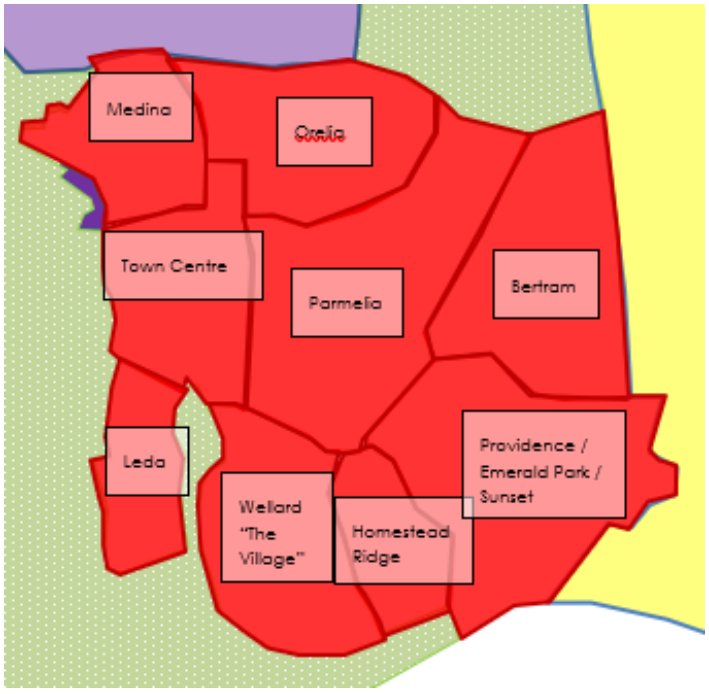
Rather than designing a bicycle and walking plan for a future population of 70,000 people9, where few will be expected to benefit from the limited projects that can be built within the next 15-20 years, GTA together with the City have taken the approach of designing individual plans for neighbourhoods that presently have between 1,500 to 2,000 people, that can be rolled out in priority order, and easily adapted to reflect changes on the ground over the coming instalments.

The plans have focused on retrofitting existing neighbourhoods, as well as provide strategic advice for the new developing areas (recognising the potential to adjust agreed structure plans is limited).

Figure 10.1 indicates the neighbourhoods of the townsite considered, with the neighbourhoods in context of the overall local government area.

RECOMMENDATION 6: Prepare a separate footpath and cycling plan for the industrial areas of the City

Figure 10.1: Neighbourhoods



[9] Kwinana population forecast 2031 (Community Infrastructure Plan)

11. Bertram (Pedestrian Improvement Plan)

11.1 Background

During the consultation with the local community as part of the *CrowdSpot* survey, it was discovered the number of walking hotspots in Bertram far surpassed all the other City of Kwinana neighbourhoods. The responses were found to be particularly around Bertram Primary School and Bertram Community Centre. The predominate concerns were the absence of footpaths and crossing points (missing kerb ramps etc.).

Although a newer suburb, Bertram is deficient in pedestrian network infrastructure, significantly hindering the safety of walking in the community, to the extent that it is proposed to be the first neighbourhood plan for implementation.

While it is a newer neighbourhood in the context of the original neighbourhoods of Kwinana, (being developed in the 1990s and 2000s), it requires investment to deal with serious oversights in the development that relate to the pedestrian network. The City of Kwinana has indicated it has focused on retrofitting pedestrian infrastructure to the older suburbs, based somewhat on the assumption that the newer development would have a safe and functional network.

Therefore, it was agreed with the City that the neighbourhood plan for Bertram would focus on a pedestrian improvement plan for initial implementation. Longer term links and projects that relate to cycling will be identified with limited progress proposed in the initial implementation phase.

The neighbourhood planning concept still applies, whereby the community meeting point is identified and linkages to both secondary and local destinations are proposed.

11.2 Secondary Destinations

- **Kwinana Train Station** – one of the 4 destinations considered strategic in the City of Kwinana is positioned on the border of Parmelia and Bertram.

The train station is 1.7km from Bertram Community Centre and therefore a local route is proposed to connect people cycling to these destinations for physical activity.

Darius Wells Library and Kwinana Adventure Park are 4.2km and 4.7km respectively from Bertram Community Centre (the centre of Bertram). As these are significantly beyond the 1-2km cycling distance which is the focus of the plan, no routes are proposed, except via the existing secondary route network (e.g. Bertram Road and Sulphur Road).

Wellard Town Centre is 4km from Bertram Community Centre, beyond the 1-2km focus of the plan. A secondary route is proposed on Bertram Road that forms part of the secondary route to Wellard Train Station which will ultimately be superseded by the Primary Route from Kwinana Train Station to Wellard Train Station on the rail reserve. Connections to secondary routes are proposed in 11.5.4.

11.3 Local Destinations

- **Bertram Community Centre** -- the community meeting point for Bertram and starting points for which much of routes will connect to.
- **Bertram Primary School** – potential for students to cycle and walk to school who live in Bertram (specific focus of 400m catchment).
- **Kings College** – potential for students to cycle and walk to school, who live in southern part of Bertram (recognising Bertram Road is a barrier).

There are 24 parks, reserves and public open spaces in Bertram with opportunity to link them. The immediate focus for the Bertram Neighbourhood Plan is on pedestrian improvements to address the deficiencies in Bertram, and the connections to the three local destinations mentioned above. Therefore, links to parks and reserves to encourage physical activity is proposed to be considered as a separate exercise or within the next bicycle plan. The connections between parks and reserves in Bertram must not be overlooked in the next cycling and walking neighbourhood plan for Bertram (2023 and beyond).

11.4 Bertram Pedestrian Improvement Plan

Based on the local connections, school catchment connections and secondary route connections prescribed, the Bertram Pedestrian Improvement Plan includes the projects in Table 11.1 focused on:

- Footpath improvements to Bertram Primary School and Bertram Community Centre.
- General improvements to kerb ramps to address crossing point deficiencies.

Table 11.1: Bertram implementation plan (pedestrian improvement)

Priority	Project	Destinations
K1	Tranby Way (footpath on both sides)	Bertram Primary School
B1	Trusty Way (crossing at Price Parkway)	Bertram Primary School
B2	Sulphur Road (extend footpath on south side from station entrance to existing shared path over bridge)[10]	Kwinana Train Station
B4	Johnson Road crossing (Ascot Parkway north)	Bertram Community Centre Bertram Shopping Centre
B5	Johnson Road crossing (Ascot Parkway south)	
B6	Johnson Road crossing (Whiteman Crescent)	
B7	Chieftain Street footpath (Moombaki to Parkfield) (south side)	Bertram Primary School Kings College
B8	Eliza Street footpath	Bertram Primary School
B9	Unicorn Street footpath	Bertram Primary School
B10	Yelka Street footpath	Bertram Primary School
B11	Chipperton Road footpath (Moombaki to Parkfield)	Kings College
B12	Orient Way footpath (Parkfield to Westmoreland) – include crossing of Parkfield	Kings College
B13	Parkfield Boulevard crossing (install kerb ramp at east side of Ganges)	Bertram Community Centre
B14	Moombaki Avenue crossing (redirect crossing of Champion Drive terminating in roundabout)	Bertram Primary School
B15	Trusty Way (path on west side through car park) * liaise with Primary School about location and crossing points of car park entry / exit	Bertram Primary School

[10] Although the project is in Parmelia this project benefits the Bertram community rather than Parmelia community due to its location east of the train station

Priority	Project	Destinations
B16	Johnson Road (path on one side from Sulphur Road to Thomas Road)	
B17	Daniels Place (install kerb ramp near Greenham Way to connect to Bertram Road shared path)	Secondary route
B18	Daniels Place (install kerb ramp at cul-de-sac to connect to Bertram Road shared path)	Secondary route
B19	Lotus Court (provide footpath connection from cul-de-sac to existing path for a more direct link to Bertram Road shared path)	Secondary route
B20	McKenzie Corner (install kerb ramp at cul-de-sac to Bertram Road's shared path)	Secondary route
B21	McKenzie Corner (install kerb ramp at 90-degree bend to Bertram Road's shared path)	Secondary route
B22	Greenham Way (install kerb ramp to Bertram Road's shared path just west of path intersection)	Secondary route
B23	John Forrest Circuit west (install kerb ramp and small path connection to Bertram Road's shared path)	Secondary route
B24	Path on Daintree Loop (north of drainage channel) to connect to Principal Shared Path	Kwinana Freeway PSP
B25	Path on Daintree Loop (south of drainage channel) to connect to Principal Shared Path	Kwinana Freeway PSP
B26	Millbrook Avenue crossing (path connection and kerb ramp at Camborne App)	Moombaki Park / POS

A significant number of maintenance issues were raised in the *CrowdSpot* survey and have been tabled for addressing the implementation plan (Table 11.2).

Table 11.2: Bertram implementation plan (maintenance program)

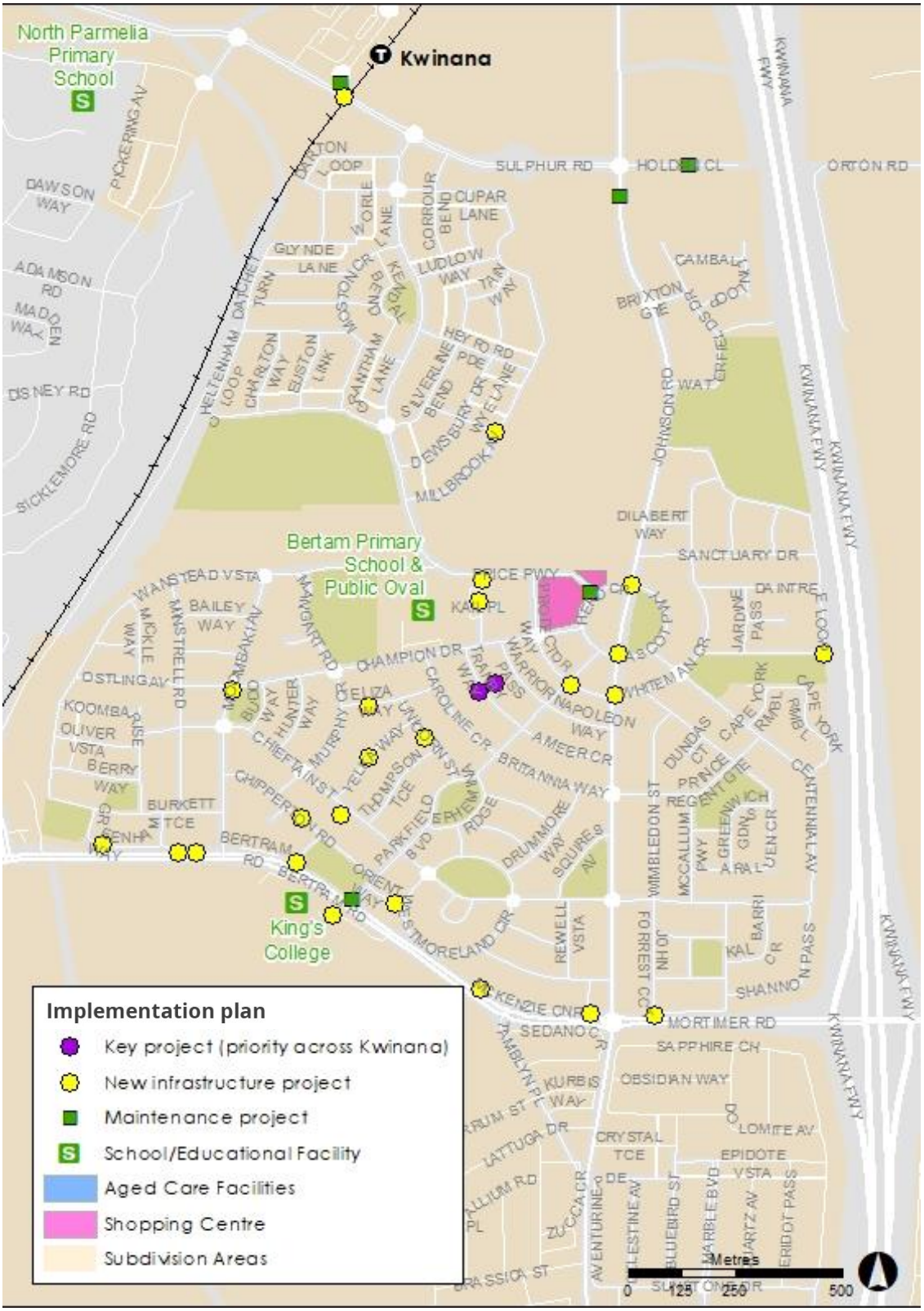
Location	Implementation
Bertram Road	Overgrown vegetation obstructing view to cross Parkfield Boulevard
Centennial Avenue	Broken pole edges hazard to children
Johnson Road (Sulphur Road to Brixton Gate)	Broken glass on path
Bertram Medical Centre	Damaged residential bin in adjacent vacant land

Other issues were raised in the *CrowdSpot* survey and have been tabled for addressing the implementation plan (Table 11.3).

Table 11.3: Other issues for consideration in Bertram

Location	Issue
Moombaki Avenue roundabout	Speed of cars through roundabout dangerous for kids walking home from Bertram Primary School
Bertram Road / Johnson Road	Difficult crossing for pedestrians
Shannon Pass / Centennial Avenue	Dangerous intersection without give way sign
Ascot Parkway	Poor lighting
Everglades Park	Dog business (requires dog bags)
Trusty Way	Cars parking on footpath (consider bollards liaise with school)
Price Parkway / Hero Crescent	Cars parking on footpath (consider bollards liaise with school)

Figure 11.1: Bertram implementation plan



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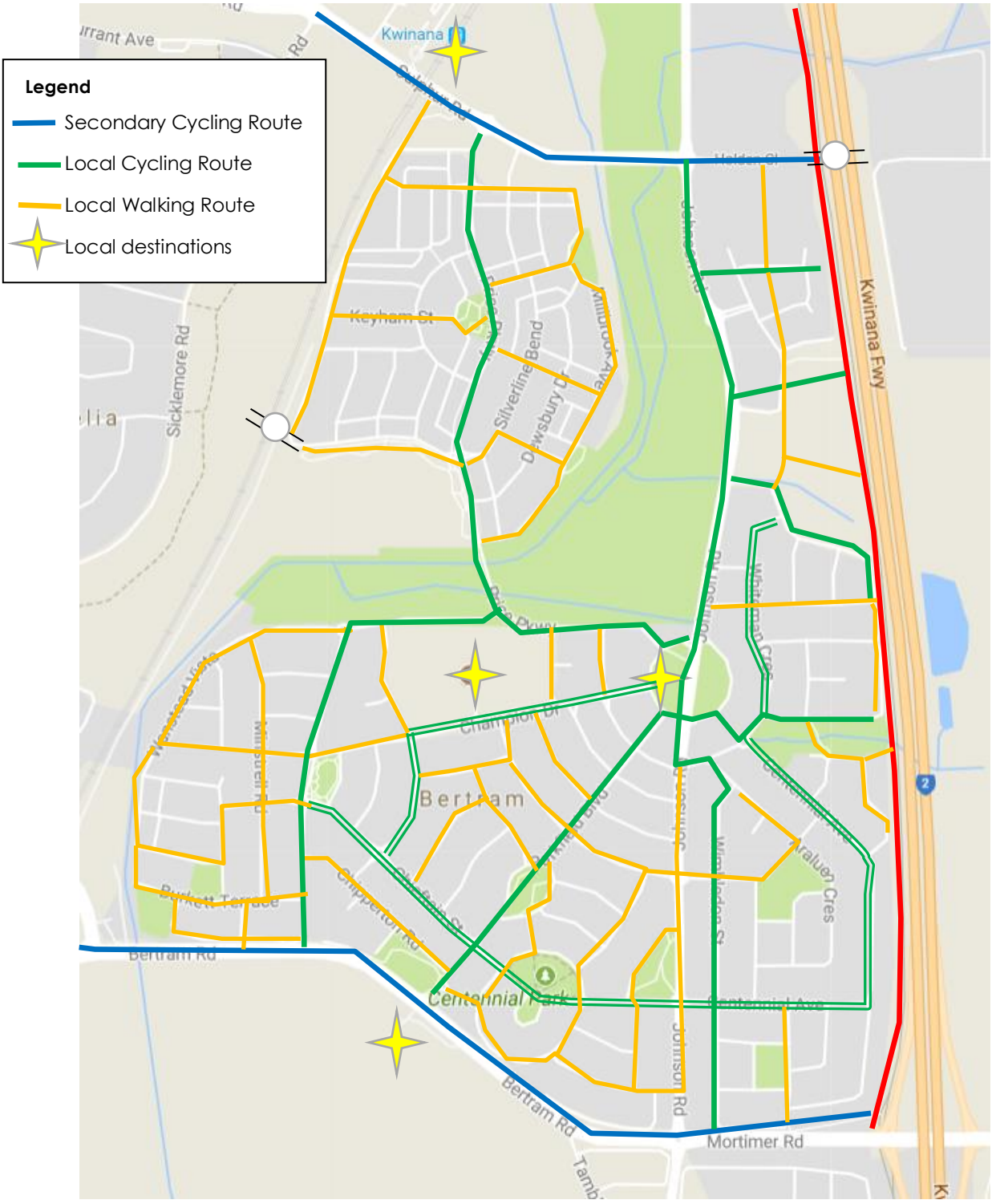
11.5 Long Term Neighbourhood Network Plan

Although the focus of the implementation is the pedestrian improvement plan, the neighbourhood plan is proposed for refinement in the 2023 cycling and walking plan. The long-term neighbourhood network is proposed in Figure 11.2.

Figure 11.2: Bertram long term implementation plan



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The long-term network for cycling in Bertram is focused on the secondary route from Kwinana Town Centre to Kwinana Train Station which runs to the north of Bertram. The links north-south between Bertram and Holden Close / Sulphur Road are important long-term, however will not be developed in the implementation plan due to the focus on pedestrian improvement as prescribed previously. Future subdivisional stages of Bertram need to ensure north-south linkages, as well as east-west connections to the primary route on the Kwinana Freeway (refer to neighbourhood plan in Figure 11.6).

The Bertram Pedestrian Improvement Plan focuses on immediate projects to address serious safety deficiencies (Section 11.4). However, a long-term network is proposed focussing on the two schools: Bertram Primary School and Kings College. The following routes are the focus of the long-term network with some of the projects falling within the implementation plan.

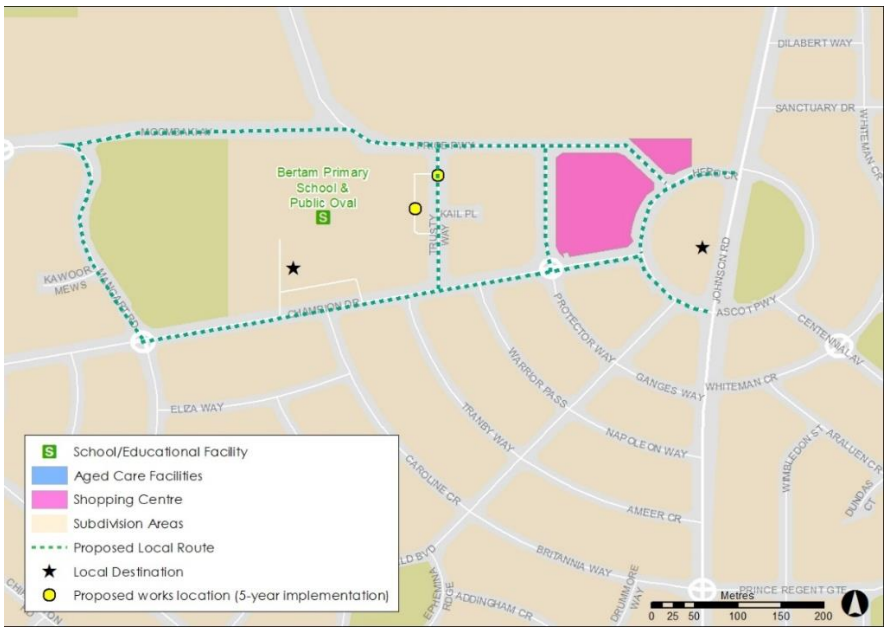
- Bertram Community Centre to Bertram Primary School
- Bertram Community Centre to Kwinana Train Station
- Safe Connections to Bertram Primary School
- Safe Connections to Kings College
- Champion Drive Safe Active Street

11.5.1 Bertram Community Centre to Bertram Primary School

The following projects are proposed:

- Champion Drive – footpath network and 30km/hr safe active street to complement other boulevards proposed in Section 11.5.5).
- Trusty Way – requires footpath and crossing (proposed in implementation plan) – potential for 30km/hr safe active street.
- Price Parkway – footpath network and cycle lanes (part of long-term cycling route from Bertram Town Centre to Kwinana Train Station).
- Protector Way and Hero Crescent – footpath network and potential for 30km/hr safe active streets.

Figure 11.3: Community Centre to Primary School local route



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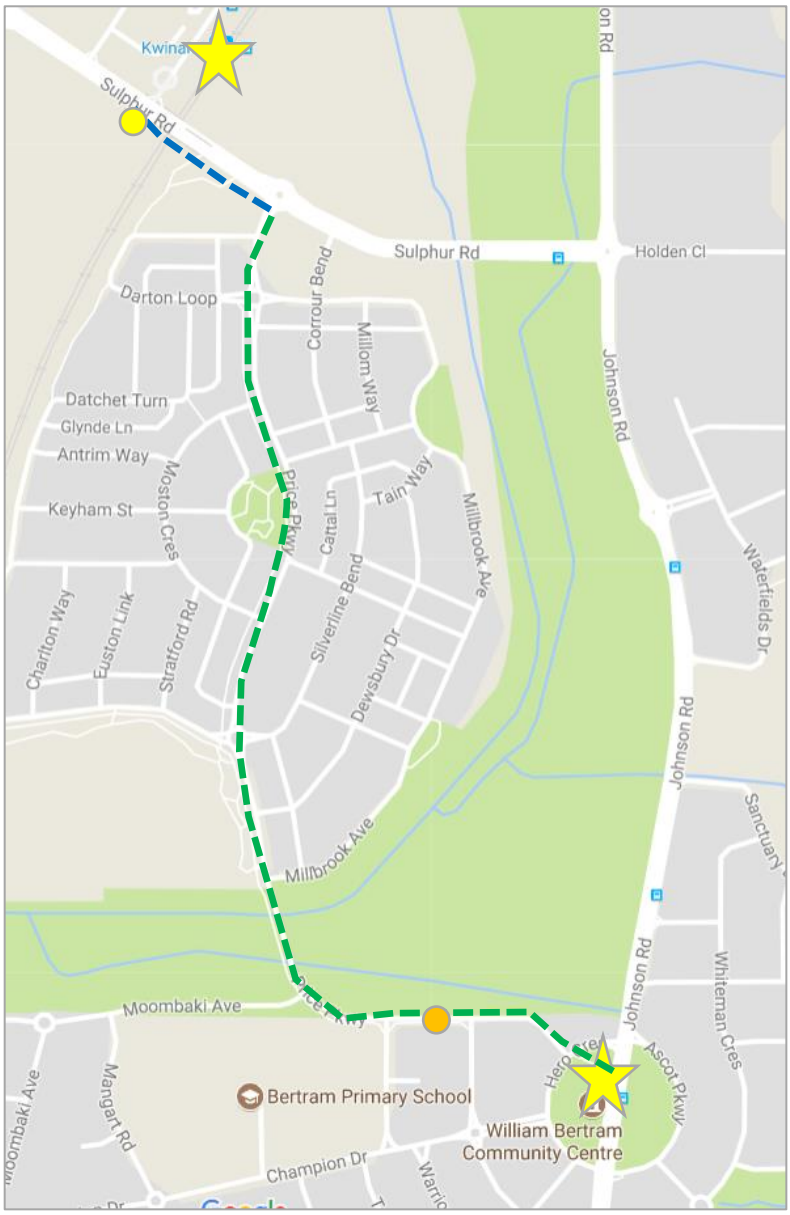
11.5.2 Bertram Community Centre to Kwinana Train Station

Figure 11.4: Bertram to Kwinana Train Station local route



The following projects are proposed:

- Sulphur Road (secondary route) – cycle lanes and path on both sides, deficient on south side west of rail line, requires additional footpath between bridge over rail line and the bus access including the crossing point of Sulphur.
- Price Parkway – red asphalt cycle lanes, becomes part of local route between Bertram Primary School and Community Centre and deficient of cycle lanes at this location, to be extended as a long-term priority.

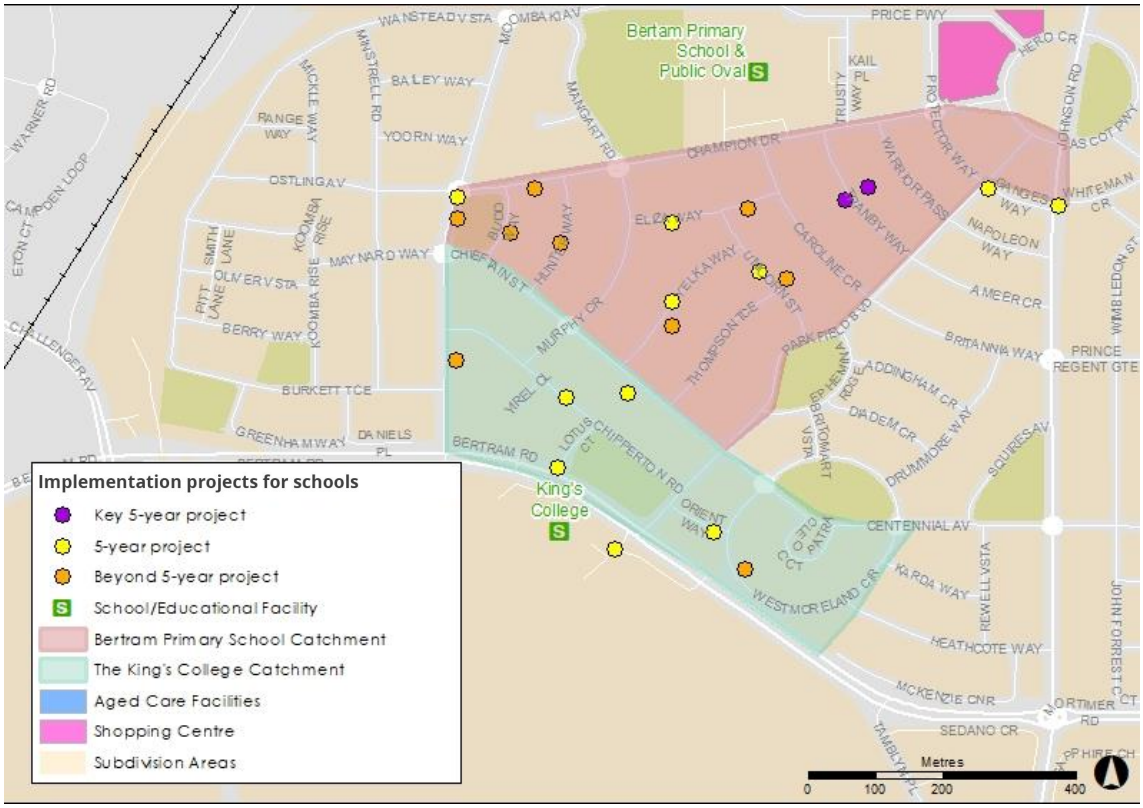
11.5.3 Safe Routes to Schools

The policy for the City of Kwinana is to have a footpath on both sides of roads, and long term this is the outcome for Bertram. However, in the short term, the focus is to ensure streets have a footpath on at least one side of every road within 400m of Bertram Primary School and Kings

College. This catchment forms a bandwidth between Champion Drive and Parkfield Boulevard, and south of Centennial Avenue. Locations that came up in the *CrowdSpot* survey and were confirmed through desktop observation and site saddle survey have become the priority of the implementation plan. Although Kings College is positioned outside the Bertram boundary, its 400m catchment is within Bertram, and has therefore been studied for identified projects in the Bertram neighbourhood.

Tranby Way is proposed to have a footpath on both sides, constructed immediately due to its proximity to Bertram Primary School and observations of cars parking on both sides of Tranby Way to drop children to school. As this project was the number one response across the local government in *CrowdSpot*, it has been moved to the key project section of the report (project K1 in Table 1.5). The remaining projects are identified in the improvement plan.

Figure 11.5: Catchment and implementation projects for schools (Bertram)



11.5.4 Connections to Secondary Routes and Kwinana Freeway PSP

One of the important aspects of a pedestrian plan is the connectivity to the network of secondary (blue) and primary (red) routes, which includes the Kwinana Freeway PSP between Perth and South Yunderup. The connections were analysed, and shortcomings addressed in the implementation plan, with some to be included in future subdivisional development, or in the long term at the City's expense. Locations are shown in Figure 11.6 on the following page.

- **Sulphur Road / Holden Close** – Price Parkway connection is considered adequate and part of the local route network (Section 11.5.2); Johnson Road connection is to be connected with developer contribution; new north-south connection to Holden Close to be developed as part of future subdivision.
- **Kwinana Freeway** – Holden Close adequate (part of secondary route); Sanctuary Drive adequate (part of local route); Mortimer Road adequate; new east-west connections

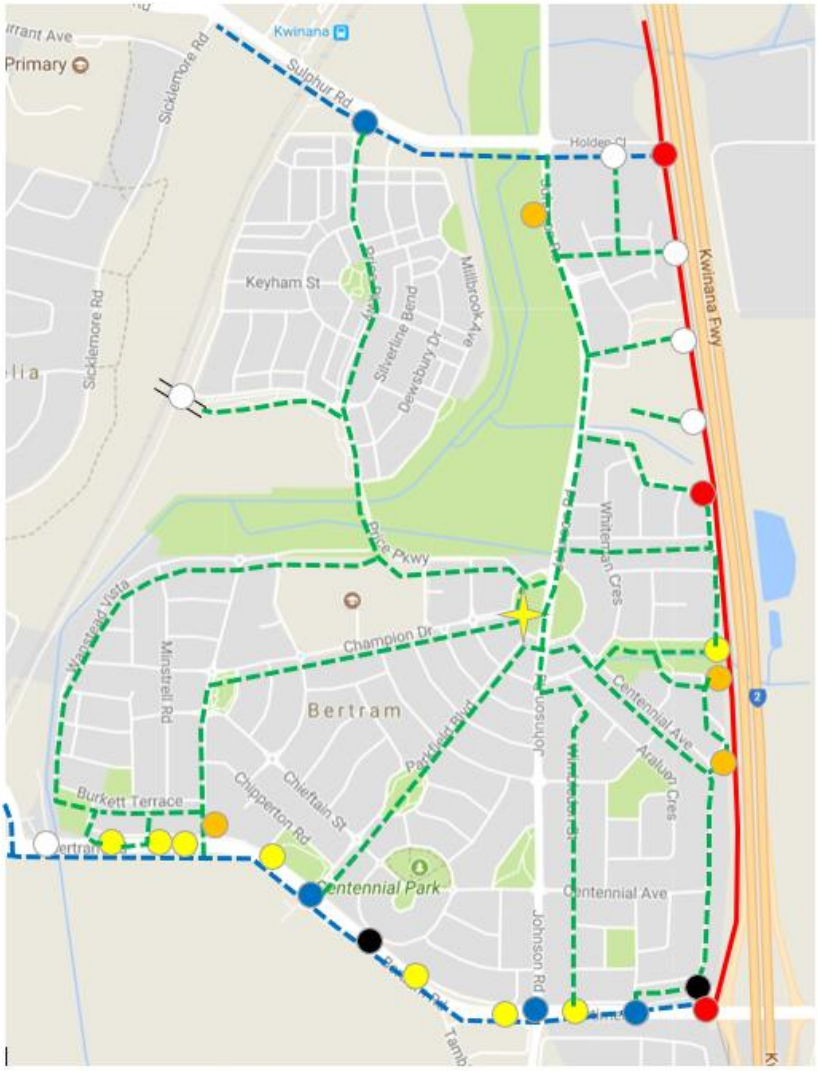
between Holden and Sanctuary to be developed as part of future subdivision; two additional connections proposed in implementation at Daintree Street Park on the north and south of the drainage channel; another connection at Cape York Ramble is proposed (longer-term) and requires removing a panel of noise well, to be done through consultation with local community; a connection from Shannon Pass is not possible due to house construction without pedestrian access to the freeway path.

- **Bertram Road / Mortimer Road** – John Forrest Circuit east, Johnson Road and Parkfield Boulevard are adequate; John Forrest Circuit west, McKenzie Corner east and McKenzie Corner west, Lotus Court, Daniels Place, Greenham Way east and Greenham Way west all require connections and proposed in the implementation plan; direct access is not feasible from Westmoreland Circuit without major earthworks and is not proposed in this plan (should future demand require it City of Kwinana should consider in subsequent neighbourhood plans).
- Bertram Road and its extension into Mortimer Road is the only secondary route to be considered for local connections in Bertram area.

Table 11.4: Local route pedestrian connections to secondary routes

Road (Section)	Implementation	Long-Term
Bertram Road (Kwinana Town Centre to Mundijong)	Kerb ramp on McKenzie Corner (at 90-degree bend) Kerb ramp on McKenzie Corner (at cul-de-sac) Path connection from Lotus Court to Chipperton Park Kerb ramp on Daniels Place (at cul-de-sac) Kerb ramp on Daniels Place (near Greenham intersection to access bus stop) Kerb ramp on Greenham Way (just west of Bertram Rd shared path)	New shared path on east side of Moombaki Avenue (Chieftain St to Bertram Rd)
Mortimer Road (Kwinana Town Centre to Mundijong)	Path connection from John Forrest Circuit (western side as extension of Wimbledon street)	
Sulphur Road (Kwinana Train Station to Byford)	-	New shared path on west side of Johnson Road
Holden Close (Kwinana Train Station to Byford)	-	Developer to construct north-south route into Holden Close
Kwinana Freeway (Holden Place to Sanctuary Drive)	-	Developer to construct 3x east-west routes into Kwinana Freeway
Kwinana Freeway (Sanctuary Drive to Mortimer Road)	Path and connection north of drainage channel in Daintree Street Park	Path and connection south of drainage channel in Daintree Street Park New shared path and connection including removal of noise wall section to suite (consultation required)

Figure 11.6: Bertram connections to secondary routes and PSP



11.5.5 Safe Active Streets

A Proposed Safe Active Streets network to be explored in detail include Champion Drive, Chieftain Street, Centennial Avenue and Whiteman Crescent with Trusty Way, Protector Way and Hero Crescent also potential locations. DoT currently have funding for the design and construction of Safe Active Streets. Within the implementation program, Champion Drive is noted as a project to develop further.

11.6 End-of-Trip and Mid-Trip Facilities

Bicycle parking within Bertram was not raised as a deficiency and therefore no proposals have been made for this neighbourhood but should be re-evaluated in subsequent cycling and walking plans, focused on the local shopping centre and community centre.

12. Medina

12.1 Background

Medina, the first of the Kwinana suburbs developed, was constructed by the then State Housing Commission to meet the housing needs of the newly established Kwinana industrial area in the 1950s. Its streets were named after passengers and crew of The Medina. Medina was one of the first estates built according to the British New Town Model, in Australia.

Through consultation with City of Kwinana community officers, it was discovered Medina is an environmentally conscious community, creating an opportunity to develop a progressive neighbourhood plan to serve as a demonstration for other neighbourhoods (see 12.7).

12.2 Secondary Destinations

There are no secondary destinations in Medina itself, however, Kwinana Adventure Park is situated within 1-2km radius of Medina, meaning a large portion of the Medina community is within walking and cycling distance to take their families to this recreational destination. Darius Wells Library and Resource Centre, the other secondary destinations within the City of Kwinana Town Centre, is also within 1-2km of most of the Medina community, and therefore a priority to develop a footpath and cycling network. It is considered a priority within the implementation timetable to connect the Medina community to Kwinana Adventure Park and Darius Wells. Gilmore College and South Metropolitan TAFE are also within 1-2km of a significant portion of Medina and are also needed to be considered in the Medina neighbourhood plan. Way finding signage to these destinations should be developed as part of the neighbourhood plan.

12.3 Local Destinations

There most important destinations for the neighbourhood of Medina are understood to be:

- **Harry Mcguigan Park** – central meeting point for Medina community and alternative to adventure park in Calista.
- **Medina Primary School** – central school for Medina community.
- **Medina Shopping Centre** – central meeting point for Medina community.
- **Medina Oval** – home of "The Mighty Knights" football club Medina.
- **Thomas Oval** – well utilised sporting ground including netball courts recently refurbished.

These destinations are proposed to be connected by a demonstration east-west local cycle route to be developed in the implementation plan that also connects to: Thomas Kelly Pavilion, Medina Hall, Southern Districts BMX Raceway, and Kwinana Loop Trail.

12.4 Developing a Long-Term Network – Cycling

The long-term network for cycling in Medina is focused on a secondary route from Kwinana City Centre to Coogee which runs to the north and east of Medina. This route is considered a lower priority for implementation and will be considered more in subsequent cycling and walking plans, to focus on the Kwinana Town Centre to Kwinana Train Station route.

The Medina long-term cycling network will be focused on safe active streets (see 12.4.1) in the City Centre and western side of the neighbourhood.

12.4.1 Safe Active Streets

Proposed safe active streets identified within this plan are along Bingfield Road West, Tucker Street and Beacham Crescent. Within the neighbourhood centre itself, Hoyle Road, Harley Way, Pace Road (west of Harley), Nannup Street, Wheelock Drive and Medina (Pace to Wheelock) are also potential locations.

These are detailed as a project for concept development in the implementation plan.

12.5 End-of-Trip and Mid-Trip Facilities

Bicycle parking within Medina was raised as being deficient in the shopping centre, specifically around IGA and directly in front of The Green Barista Cafe. Existing Cora rack in the side alley appears to be underutilised and could potentially be relocated to IGA and replaced with U-rails that can be expanded as demand requires. Liaison with the shopping centre is required to determine position, to ensure they are convenient within 10m of the entrance doors if practical. Harry Mcguigan Park also requires additional bicycle parking, with water fountains to complement it.

These facilities are important to ensure cycling journeys to the neighbourhood connectors are convenient and not replaced by car trips. Further consultation should be undertaken within the community to determine bicycle parking provision and capacity to provide future growth in the numbers of people cycling.

12.6 Developing a Long-Term Network – Pedestrians

It is the long-term objective to ensure footpaths with adequate crossing points exist on both sides of all streets to connect homes to local destinations.

While Bertram will be the recipient of funding for pedestrian facilities as part of its improvement plan (see Chapter 11), some key projects are proposed to enhance pedestrians and at the same time benefit people cycling distances of 1-2km for local trips.

12.7 Neighbourhood Plan

Medina is an environmentally conscious community with a desire to "green" the neighbourhood with landscaping, and therefore have potential to be a pioneering community to encourage walking and cycling. Some of the priorities for the neighbourhood are as follows:

- There is potential to develop Harry Mcguigan Park into a mini Kwinana Adventure Park and to promote to residents within the City of Kwinana as an alternative for families than using the very popular park used by people outside the Kwinana area.
- Development of a local route from Thomas Oval to Medina Oval spanning east west across Medina and recommended as a demonstration project in the implementation plan.
- Proximity to secondary destinations of Kwinana Adventure Park, Darius Wells Library and Resource Centre, Gilmore College and South Metropolitan TAFE, to the Medina neighbourhood.
- Utilise the laneway behind Medina Shopping Centre which has undergone a recent redevelopment.
- Promote Medina as a pioneer neighbourhood of its kind in Australia.
- Pace Road – as the main street, there is potential to pedestrian prioritise, creating a low speed 30km/hr street.

- Tucker Road has traffic calming and potential for a Safe Active Street / local bicycle boulevard to connect Thomas Road to Thomas Oval sporting facility as well as access to the Kwinana Loop Trail.
- Promote the access to Kwinana Loop Trail within Medina.

The long-term network plan for Medina is shown in Figure 12.1 below with demonstration east-west routes indicated in bold (see Figure 12.3).

Figure 12.1: Medina neighbourhood plan

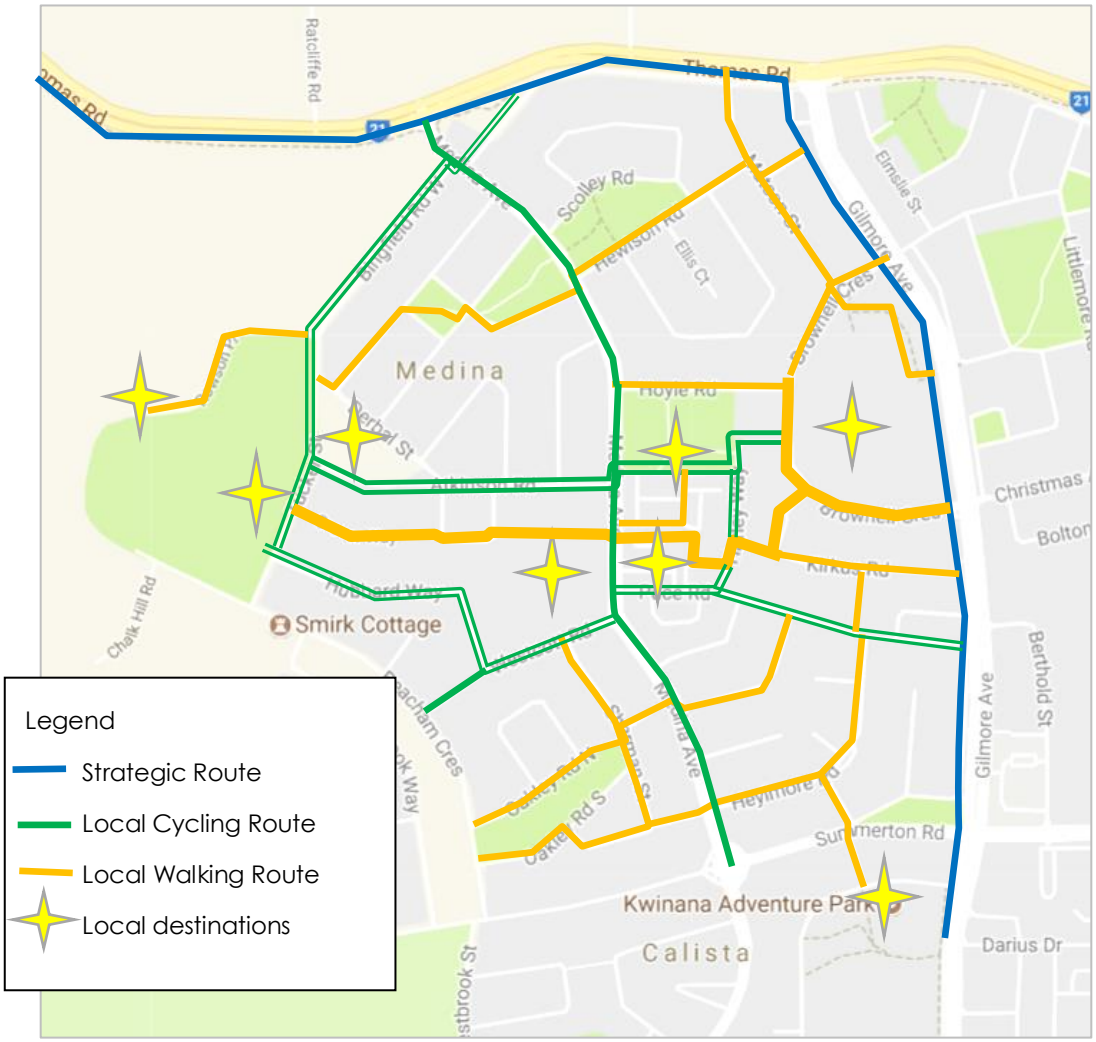


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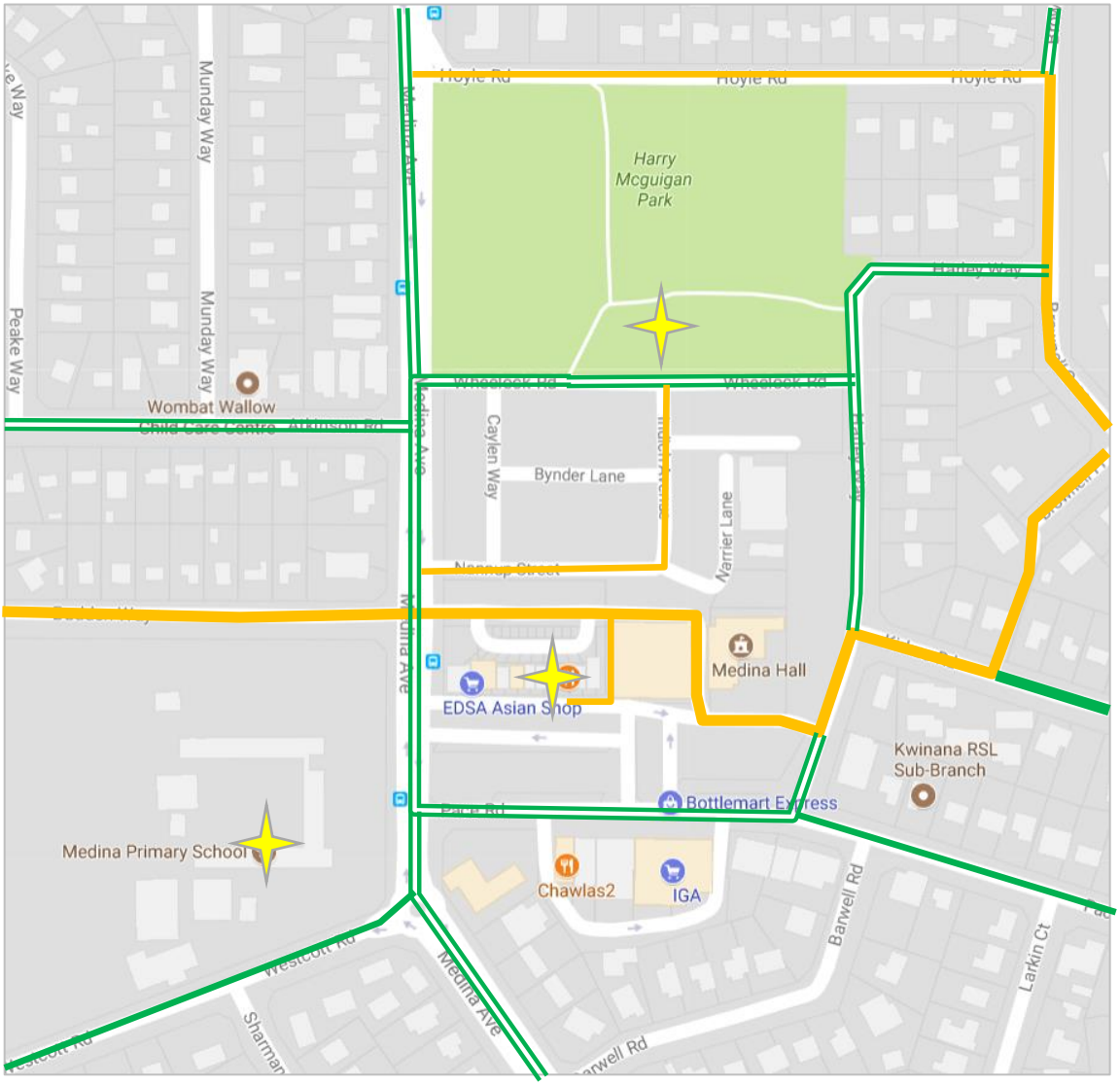
Figure 12.2: Medina neighbourhood plan (neighbourhood centre)



Demonstration east-west local routes are defined in the following page and includes wayfinding in addition to the footpath and safe active street proposals. Consultation is required with the local primary school and should also include discussion with the Medina progress association before implementation.

Figure 12.3: East-west local route (Thomas Oval to Medina Oval)

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12.8 Medina Implementation Plan

Figure 12.4: Medina implementation plan

Priority	Project	Destinations
M1	Brownwell Crescent – 600m footpath (2m) on east side from car park to Gilmore Avenue (south)	Medina Oval
M2	Medina bicycle parking – relocate Cora racks in laneway to IGA entrance and replace with U-rails; add designed U-rails to Green Barista Café entrance with planter boxes in consultation with owner; add U-rail in front of bakery	Medina Shopping Centre
M3	Budden Way – 230m footpath (2m) on southern side from Grover Way to Medina Avenue (liaison with Medina school required with implications on street parking)	Medina Primary School Medina Shopping Centre
M4	Safe Active Streets (stage 1) – design and construction of 1km of treatments incl. 30km/h speeds on Atkinson Road, Wheelock Road, Harley Way (north of Wheelock)	Thomas Oval Medina Shopping Centre Medina Oval
M5	Safe Active Streets (stage 2) – design and construction of 1.6 km of treatments incl. 30km/h speeds on Bingfield Road W, Tucker Street, Hubbard Way, Westcott Road	Kwinana Loop Trail Thomas Oval Medina Shopping Centre
M6	Safe Active Street (stage 3) – design and construction of 900m of treatments incl. 30km/h on Pace (west of Harley), Harley Way, Kirkus Road	Medina Shopping Centre Medina Oval
M7	Design proposal for Medina Avenue – potential for boulevard cycling route to continue through centre of Medina and Calista, to be considered in comparison to a separate path facility raised at intersections or protected bicycle lanes (all through traffic to use Gilmore Avenue, noting Medina is a local bus route, with opportunity for innovative treatments at Summerton roundabout such as a raised pedestrian / cyclist crossings)	Medina Shopping Centre Medina Primary School
M8	Pace Road – pedestrian crossing on the main street of Medina (design project)	Medina Shopping Centre
M9	Walkability Enhancement Plan (Stage 2) – more detailed consultation and network analysis to determine deficiencies and improvements especially the standard of crossings, e.g. path condition, kerb ramps and tactile ground surface indicators	-
M10	Create neighbourhood wayfinding strategy in consultation with Medina Progress Association to local destinations such as Kwinana Loop Trail, Medina Primary School, Harry Mcguigan Park, Medina Shopping Centre, Medina Oval, Kwinana Adventure Park, Darius Wells Library, Kwinana Marketplace	-
M11	Medina Avenue – repair footpath damaged by tree root (maintenance)	-
	Total 3.5km safe active streets; 830m footpath	

13. Leda

13.1 Background

Leda was developed after the first 4 neighbourhoods of Medina, Calista, Parmelia and Orelia, in the 1970s. Leda is separated into two neighbourhoods by Gilmore Avenue; old Leda to the north and west and newer Leda to the south and east of the major avenue in Kwinana. Old Leda is closer connected to Calista, while new Leda is closer connected to Wellard. However, for the intent of this cycling and walking plan, the neighbourhoods have been combined as one.

Following the consultation with the community and relevant sections of the City, it was discovered the neighbourhood of Leda was particularly deficient in footpaths which created a lack of central community meeting points that other neighbourhoods had. Therefore, it was proposed to focus the neighbourhood plan on constructing footpaths on roads that connect to key parks in Leda.

Connections to parks and reserves serve as central meeting points for the community, as well as provide short cycle trips to encourage residents to be physically active, complimenting the objectives of this plan.

Despite Leda being a fragmented community in the way it was designed, the opportunity is presented because of the extensive pedestrian access ways between cul-de-sacs to overcome this fragmentation with connections to parks and reserves for walking and cycling.

Leda needed central meeting place(s) because of the closure of the IGA in the local shopping centre which has been replaced with a bottle shop. Parks are proposed to become the meeting points and detailed in section 13.3.

Because of the opportunity to address the connectivity concerns, the Leda neighbourhood plan is proposed to be implemented third, after Bertram and Medina.

13.2 Secondary Destinations

There are no secondary destinations in Leda, the nearest being Wellard Neighbourhood Centre and Kwinana City Centre. Both centres are connected to Leda through secondary routes. Gilmore Avenue is the secondary connection to Kwinana City Centre and is largely in place. The proposed secondary route between Wellard and Rockingham Stations is to become the connection to Wellard. The protected on-road route is proposed for design and implementation in the implementation plan (as the second most important priority route).

13.3 Local Destinations

There most important destinations for the neighbourhood of Leda for this plan are understood to be the following:

- **Riley Park** – a central meeting point for North Leda.
- **Rogan Park** – a central meeting point for South Leda.
- **Gabor Park** – a central meeting point for South Leda.
- **Sloan's Cottage Park** – a potential meeting point for North Leda (reduced catchment due to outer position of suburb).
- **Djilba Reserve** – a potential meeting point for Leda (despite outer position of suburb forms part of secondary connection to Wellard from Rockingham before the Primary Route on the rail line is constructed).
- **Leda Shopping Centre** – minor shopping centre with struggling businesses recent closure of IGA and reduced community connection.
- **Leda Primary School** – a lot of people walk from Leda to school.

13.4 Leda Neighbourhood Plan

- Focus on footpath improvements to Sloan's Cottage Park, Leda Shopping Centre, Riley Park and Rogan Park.
- Develop east-west permeability from Sloan's Reserve to Gilmore Avenue, and Gilmore Avenue to Djilba Reserve.
- Integrate communities around Riley Park and Rogan Park with footpaths to enhance the neighbourhood's sense of place.

Sloan's Cottage needs promotion around Kwinana as it's a hidden treasure that people don't know exists. The park next to Sloan's cottage while not central for community, could be promoted and become a point of connection.

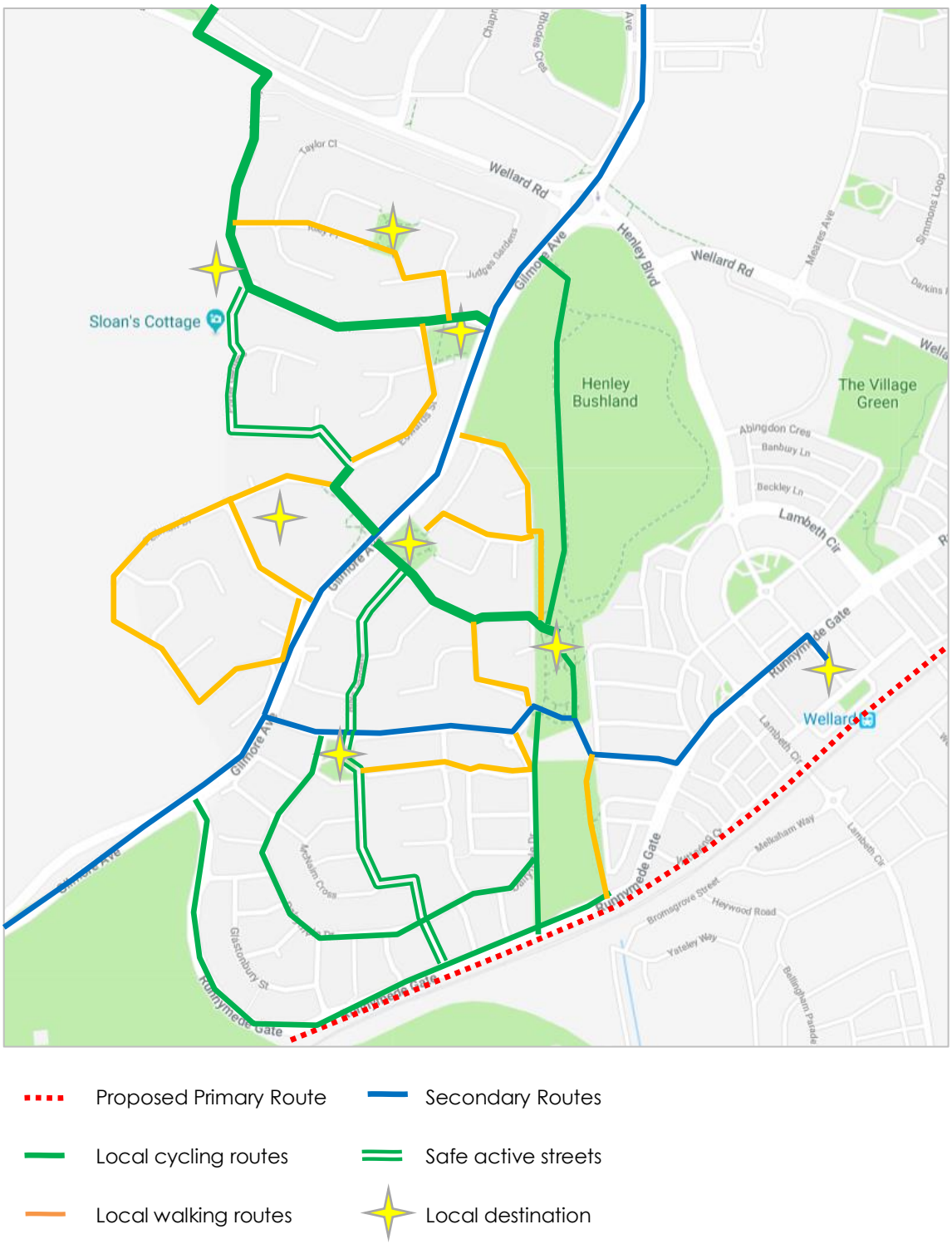
English Retreat Park is not well utilised, with potential to improve its function as a central meeting point (beyond the term of this plan) including crossing of Gilmore into Henley Bushland to Wellard.

Kwinana Community Share and Imaging Kwinana groups teamed up to do a "Planning Day" for Leda, and the City of Kwinana should partner with these groups to enhance walking and cycling to promote the projects to be constructed in the implementation plan, as well as determine the longer-term network.

It should be noted the potential to connect Leda to Wellard Community Centre and to connect Leda to Medina Shopping Centre via Westbrook Street. These are not proposed in the implementation plan due to other priorities but are recommended to be considered in the longer-term.

None of the top *CrowdSpot* identified projects were in Leda, however. Djilba View was recommended as needing a footpath. The issue of poor lighting in Djilba Reserve was also raised as a concern. These have been included in the implementation plan for consideration.

Figure 13.1: Leda neighbourhood plan



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13.5 Leda Implementation Plan

Table 13.1: Leda implementation plan

Priority	Project
L1	Crossing of Edwards Street at Dixon Mews – 50m of footpath to connect path in English Retreat Park to path on west side of Edwards and create crossing points
L2	Edwards Street – 50m footpath from Feilman Drive to shopping centre entrance (on east side) – require suitable crossing to path on west side, or preferably continue to English Retreat park (350m total)
L3	Porter Gardens – 230m of footpath from existing path termination point to the pedestrian access way at Edwards Street (on south side)
L4	Riley Place – 280m of footpath from Sloan to Riley Park (on south side, liaise with residents to confirm)
L5	Dymond Place / Moretti Retreat / Shaw Mews – 220m of footpath from Riley Park to Sloan Drive (on east side Dymond, north side Moretti and west side Shaw) – liaise with residents to confirm sides
L6	Djilba View, Werloo Court and Bilya Gardens – 300m of footpath from Rogan Park to Djilba Reserve (on north side)
L7	Whitebread Way – 250m of footpath from Rogan Park to existing path (on west / south side)
L8	Proctor Gardens – 160m of footpath from Rogan Park to Whitebread Way (liaise with residents to determine the side)
L9	Bilya Gardens – 350m of footpath from Rogan Park to Dalrymple Drive (on west side, include crossings of all legs of Dalrymple roundabout to access Gabor Park)
L10	Whyatt Green / McNairn Cross / Kooden View / Fitzsimmonds Place – 400m of footpath from Gabor Park to Dalrymple Drive south (on east side)
L11	Yeovil Way – 70m of footpath from Dalrymple Drive south to Runnymede Gate
L12	Djilba View – 50m of footpath from Dalrymple Drive to Reserve footpath (on east side)
L13	Sloan Drive – 1km of footpath on east side and north side (Wellard Road to Gilmore Avenue)
L14	Robbins Retreat – 180m footpath on east side (Riley Place to Riley Park)
L15	Shaw Mews – 170m of footpath on east side (Riley Park to Moretti Retreat) – liaise with residents to confirm side and necessity of path
L16	Taylor Close – 400m of footpath on east and south side (Riley Place to pedestrian access way to Judges Gardens) – liaise with residents to confirm side and necessity of path
L17	Judges Gardens – 400m of footpath on south and west side (Shaw Mews to pedestrian access way to Taylor Close) – liaise with residents to confirm side and necessity of path
L18	Safe Active Streets – design and construction of 1.5km of treatments incl. 30km/h speeds on Porter Gardens, Bilya Gardens, McNairn Cross, Yeovil Way
L19	Henley Reserve – 1km hard surfacing of trail to create north-south shared path (2.5m) from Wellard Road to Runnymede Gate (sections in Djilba Reserve already footpath and no change recommended)
	Total 4.6km of footpath; 1.5km safe active streets; 1km shared path

14. Kwinana City Centre and Calista

14.1 Background

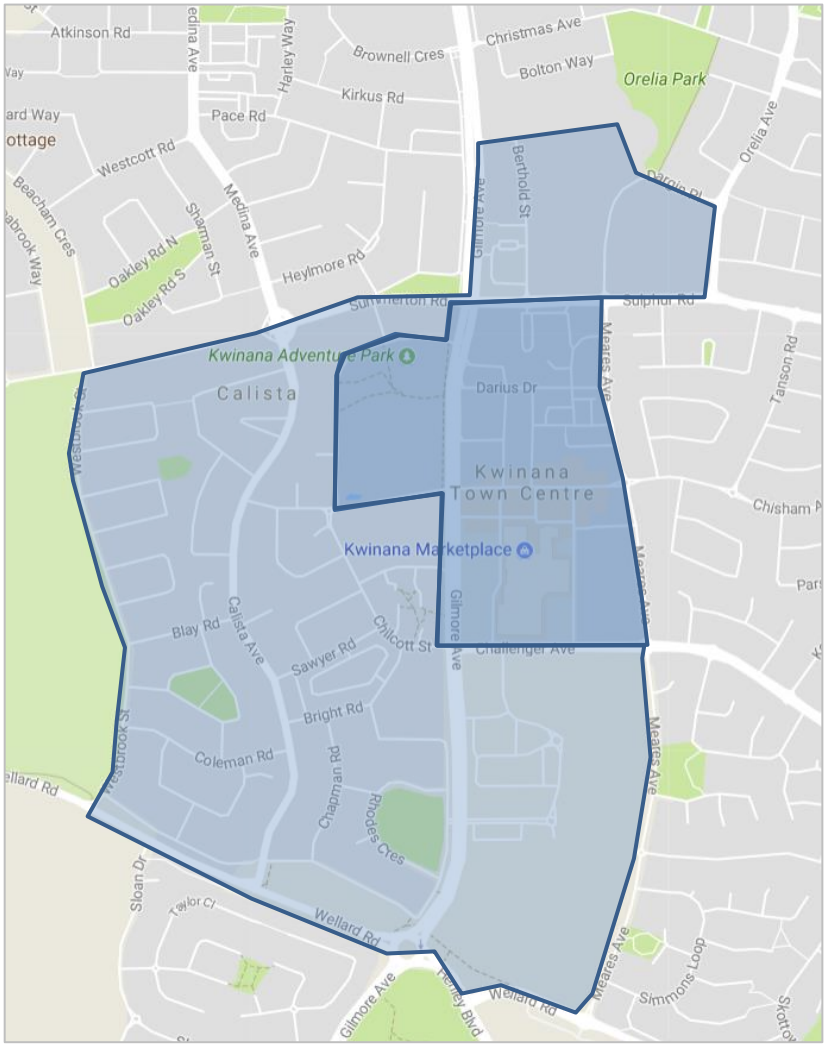
One of the most important aspects of the City of Kwinana is the City Centre, which for the purposes of this report runs between Gilmore Avenue and Meares Avenue, and from Wellard Road to Bolton Way (to incorporate Gilmore College).

Calista has been also included in the Kwinana City Centre neighbourhood area to connect the residential to the commercial and to include the profile destination of Kwinana Adventure Park into the Town Centre (and incorporate the crossing of Gilmore Avenue).

The City Centre originally formed part of Calista, which was one of the original four neighbourhoods developed in the 1950s to accommodate housing for the new Industrial area.

The implementation plan is focused on the central area shown in dark blue in Figure 14.1, between Challenger Avenue and Sulphur Road, and from Meares Avenue to Gilmore Avenue, and extending west to Walgreen Crescent to incorporate Kwinana Adventure Park.

Figure 14.1: Kwinana City Centre and Calista study plan area



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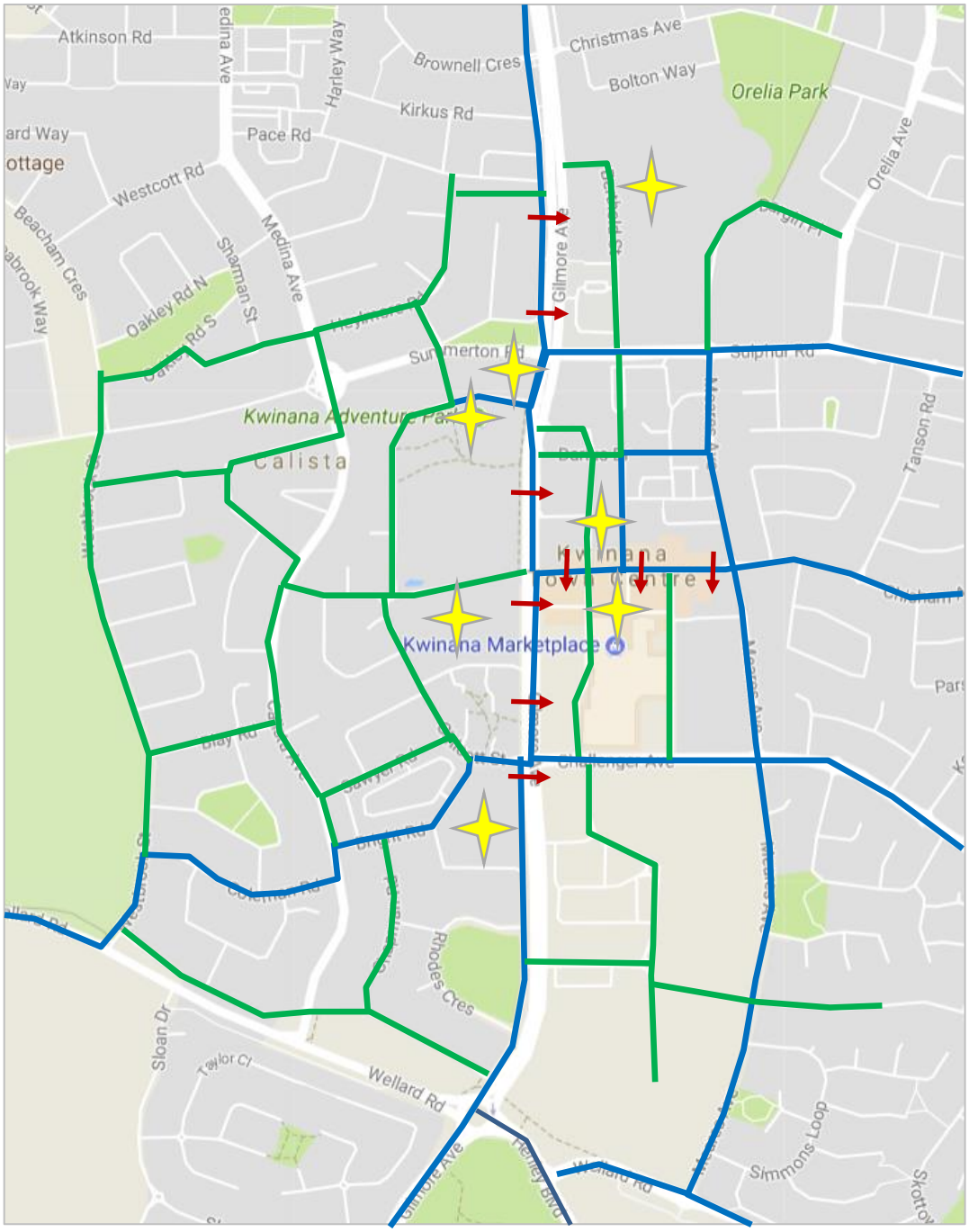
14.2 Neighbourhood Plan

The long-term network plan for Kwinana City Centre including Calista is shown in Figure 14.2 and Figure 14.3 below.

Figure 14.2: Kwinana City Centre neighbourhood plan



Crossing studies

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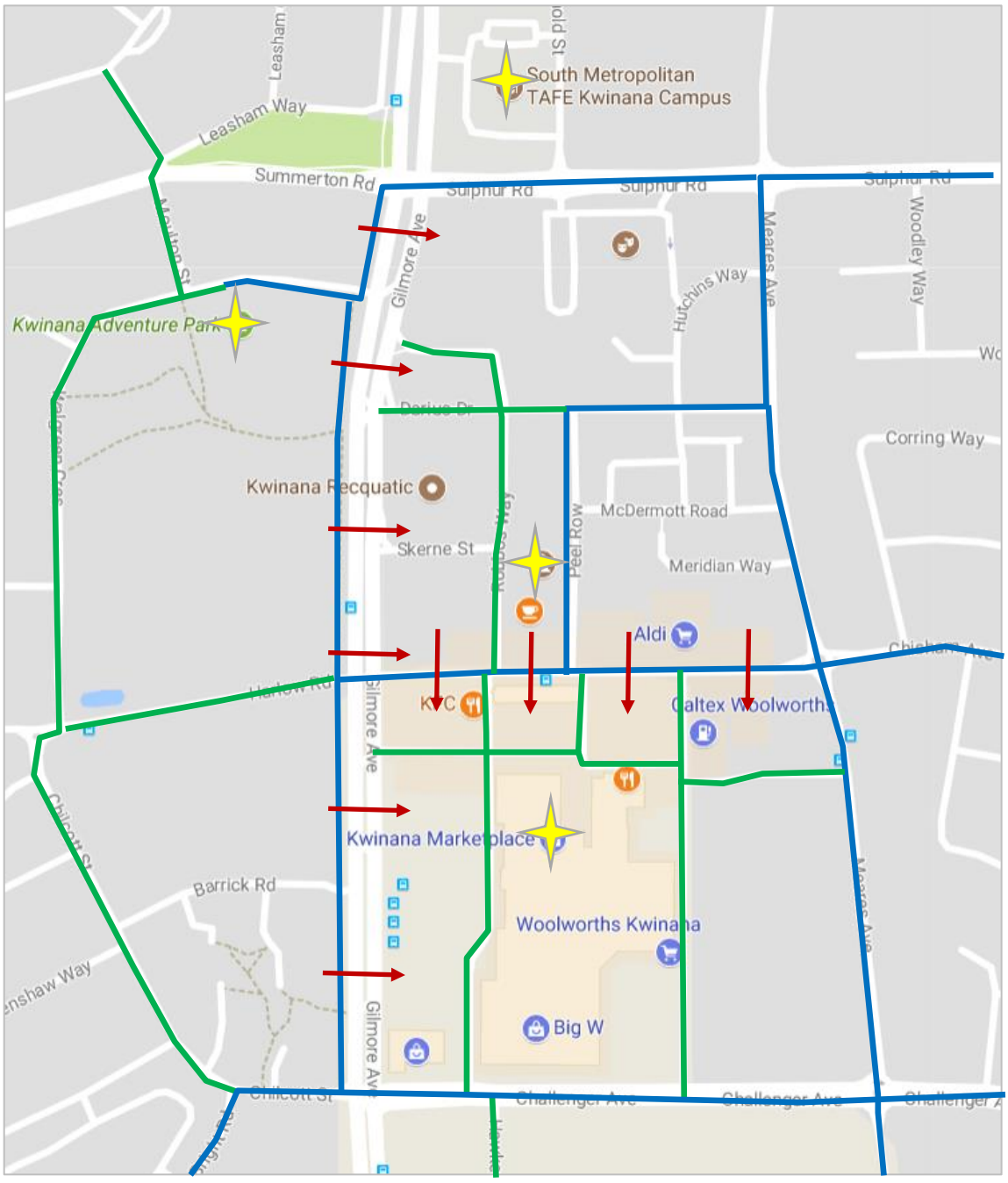
Figure 14.3: Kwinana City Centre neighbourhood plan (Central)



→ Crossing studies

The CrowdSpot survey highlighted the crossings of Chisham and Gilmore as the primary concerns, with other issues including:

- Robbos Way / Darius Drive – guard rail installed blocks crossing of both roads.
- Meares Ave / Chisham Ave roundabout – difficult crossing for pedestrians, blind spots reported and concern for students walking to Calista Primary or Gilmore College.

These projects are included in the implementation plan in Table 14.1. Options to close traffic through movement to make it a pedestrian mall and bus through-route should be explored.

Table 14.1: Kwinana City Centre implementation plan

Priority	Project	Destinations
KC1	Study of Chisham Avenue to improve pedestrian amenity through measures to reduce traffic volumes of unnecessary traffic (include roundabout at Meares Avenue for students accessing Gilmore College)	Darius Wells Library Kwinana Marketplace Gilmore College
KC2	Study of Gilmore Avenue crossing between Sulphur Road and Challenger Avenue for permeability to Adventure Park, Darius Wells Library, Kwinana Bus Station and Kwinana Marketplace	Kwinana Adventure Park Kwinana Bus Station Kwinana Marketplace
KC3	Consider removing guardrail at Robbos Way and Darius Drive to allow for crossings	Darius Wells Library

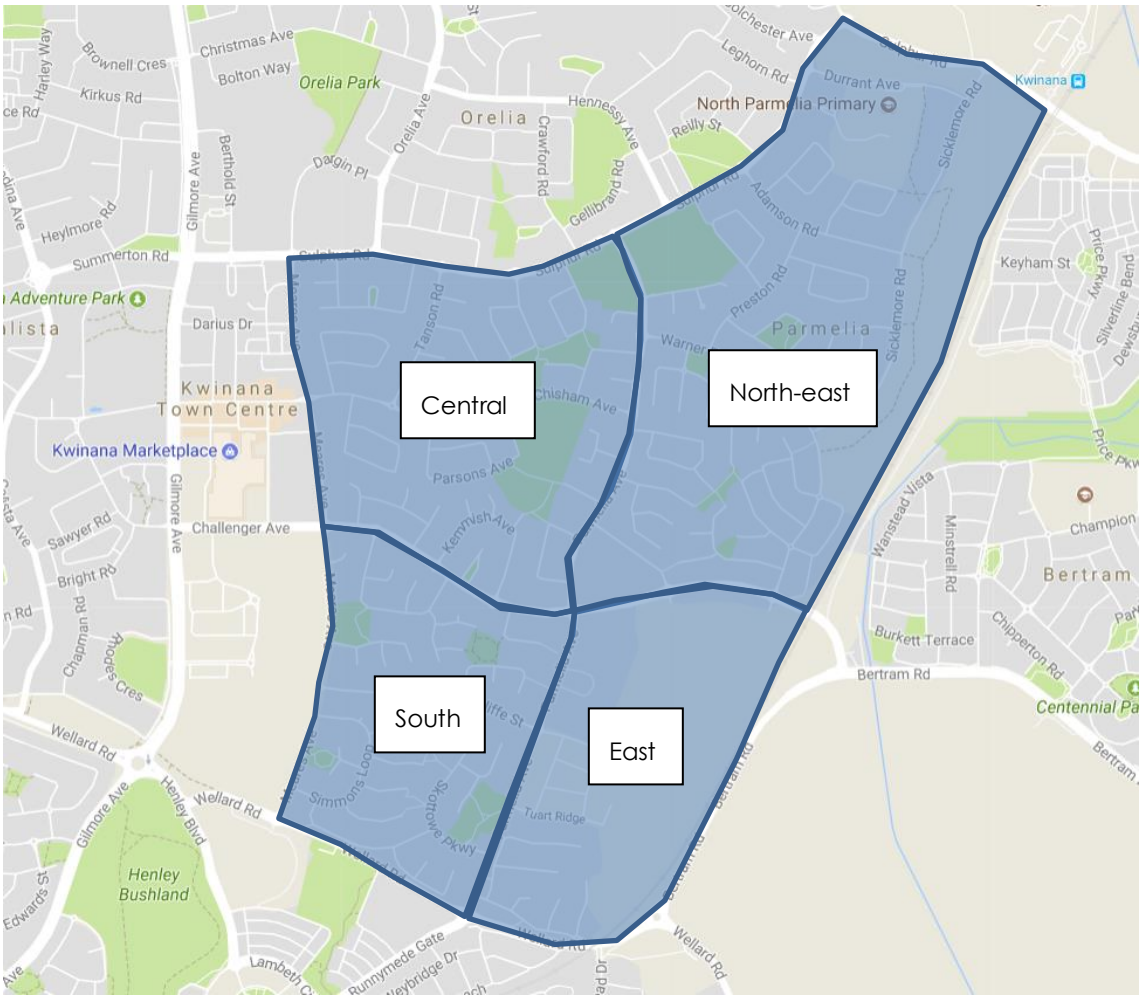
15. Parmelia

15.1 Background

One of the 4 original Kwinana suburbs, Parmelia, is named after the ship that transported the first civilian officials and settlers of the Swan River Colony to Western Australia in 1829, including Governor Stirling and his wife.

Given its proximity to Kwinana City Centre and Kwinana Train Station, Parmelia is an important location for the development of neighbourhood plans in the longer term, with significant potential for shifting travel modes from private car to walking and cycling. It is one of the larger suburbs in the City of Kwinana and therefore has been separated into 4 neighbourhoods: central, south, east, and north east (Figure 15.1).

Figure 15.1: Neighbourhoods of Parmelia



15.2 Secondary Destinations

All four of the key secondary destinations in the City of Kwinana are located on the outskirts of Parmelia.

- **Kwinana Train Station** – positioned on the border of Parmelia and Bertram and is 2km from much of the north-east neighbourhood.
- **Darius Wells Library (Kwinana Town Centre)** – this secondary destination is within 2km of the central neighbourhood of Parmelia, as well as a large portion of the south neighbourhood.
- **Adventure Park (Kwinana Town Centre)** – this secondary destination, just west of Darius Wells, is within 2km of most of the central neighbourhood of Parmelia, and some of the south neighbourhood. Considering the overlap with Darius Wells Library, the focus of the neighbourhood plans for Parmelia is to enhance the cycling and walking network to Darius Wells Library which will also enhance the network to the Adventure Park as a result.
- **Wellard Neighbourhood Centre** – this secondary destination is within 2km of a large portion of the south neighbourhood of Parmelia.

The predominant movement through Parmelia is towards the train station at the north-eastern end, and the numerous destinations in Kwinana City Centre to the west. The focus of Parmelia is therefore, the implementation of the secondary route between Kwinana City Centre and Kwinana Train Station which runs through the central neighbourhood and north-east neighbourhood. The second most important route to implement is the secondary primary route from Kwinana Train Station to Wellard Station (the on-road alternative to the future PSP – see Section 9.4.2). This route is in the north-east neighbourhood before crossing to the east side of the rail line to use Bertram Road. The development of the east neighbourhood will include a north-south secondary route on the western side of the rail line (separate to the Kwinana Loop Trail). The high-profile Kwinana Loop Trail runs in the north-east and east neighbourhoods and must be preserved / promoted with links from the north-east and east neighbourhoods.

15.3 Local Destinations

Given the significant magnitude of the secondary network in Parmelia and the priority of the other neighbourhoods, the cycling and walking neighbourhood plans for Parmelia prioritised the secondary route design and implementation before planning and implementing local connections, except where they were identified in *CrowdSpot* or known to be a concern. The local route network, feeding into the secondary routes, is recommended to be developed as a separate project in the implementation plan, or in the next instalment of the cycling and walking plan.

When the project is carried out, the following destinations should be considered, and local routes developed to connect them to the secondary route network:

- **Frank Konecny Community Centre / Skottowe Park** – a community meeting point for Parmelia and starting points for which much of routes will connect to.
- **Parmelia Peace Park** – another well visited park that forms a community meeting point, specifically with its role as a dog park.
- **St Vincent's Primary School** – potential for many to cycle and walk to school who live in the north-east neighbourhood of Parmelia (400m catchment).
- **North Parmelia Primary School** – potential for many to cycle and walk to school who live in the north-east neighbourhood of Parmelia (specific focus of 400m catchment).

- **Chisham Oval** – positioned on the secondary route in the central neighbourhood it has potential to be developed as a community meeting point.
- **Gilmore College** – potential for many to cycle and walk to school who live in the north-east neighbourhood of Parmelia (specific focus of 1km catchment).
- **Peter Carnley Anglican College** – potential for many to cycle and walk to school who live in the southern neighbourhood of Parmelia (specific focus of 1km catchment).
- **Parmelia Shopping Centre** – a local destination to people in the east Parmelia neighbourhood; significant parts of Parmelia would prefer to use Kwinana Marketplace.

The other 26 parks, reserves and public open spaces in Parmelia also have opportunity to link them. The focus is on the 3 mentioned above (Skottowe Park, Parmelia Dog Park and Chisham Oval) for the neighbourhood. These parks represent community meeting points and have the greatest potential to encourage physical activity.

The following actions are proposed to reflect the local opportunities:

- Liaise with Satterley land developer to ensure section of the secondary route, from Challenger Avenue to Wellard Road can be constructed as part of the development in the implementation plan.
- Neighbourhood connections to parks and reserves in Parmelia to be designed in the implementation plan.
- Design and implement connections to the secondary routes from local destinations.

15.4 Parmelia Neighbourhood Plan

A number of issues were raised in the *Crowdpot* survey as follows:

- Sickemore Road – badly damaged footpath
- Sulphur Road – cars parking on path blocking access to station
- Simmons Loop – no footpath
- Skottowe Park – no footpath connecting park to Skottowe parkway
- Farmer Way – no footpath
- Woodley Way – no footpath

Maintenance issue locations:

- Chisham Avenue, Parmelia – sand and tree debris on path
- Sulphur Road (Johnson Rd to Station), Parmelia – broken glass on path
- Tunnicliffe Street – damaged path and insufficient width; Parmelia Avenue intersection power pole in path (widen path around pole)

Issues for noting:

- Parsons Avenue – poor lighting

15.4.1 Safe Routes to Schools

As part of the proposed neighbourhood enhancement plans, to be developed as a separate exercise for the four areas of Parmelia, safe routes to the four schools are to be provided as follows:

- **Gilmore College** – catchment of 1km (central neighbourhood).
- **North Parmelia Primary School** – 1km catchment (north-east neighbourhood).
- **St Vincent's Primary School** – 1km catchment (east and north-east neighbourhood).
- **Peter Carnley Anglican School** (Wellard campus) – 1km catchment (south neighbourhood).

The policy for the neighbourhoods is to construct a footpath on both sides of roads and is the long-term outcome for Parmelia. The two schools that exist in Parmelia are in the north-east neighbourhood and, therefore, the routes are proposed for this neighbourhood only.

15.4.2 Connections to Secondary Routes

The focus of subsequent neighbourhood cycling and walking planning for Parmelia should be to connect the local network into the secondary route developed from Kwinana Train Station to Kwinana City Centre (Section 0).

15.5 Parmelia Implementation Plan

Table 15.1: Parmelia implementation plan

Priority	Project	Destinations
P1	Meares Avenue / Sulphur Road intersection (extend shared path 30m to connect to cycle lanes on Meares Avenue)	Darius Wells Library Kwinana Marketplace Gilmore College
P2	Secondary route design (Kwinana Station to Kwinana City Centre)	Darius Wells Library Kwinana Marketplace Kwinana Train Station
P3	Parmelia Avenue – 220m shared path (2.5m wide) from Tunnicliffe Street to northern entrance to St Vincent's school (east side)	St Vincent's Catholic College
P4	Parmelia Avenue – 300m shared path (2.5m wide) from The Ramble to Tuart Ridge (east side)	St Vincent's Catholic College
P5	Sickelmore Road – 850m shared path upgrade (2.5m wide)	Kwinana Loop Trail
P6	Skottowe Park – 30m footpath to connect to Skottowe Parkway	Skottowe Park Frank Konecny Centre
P7	Parmelia Avenue – 1.2km shared path (2.5m wide) from Challenger Avenue to Sulphur Road (east side)	St Vincent's Catholic College
P8	Tunnicliffe Street – widen footpath around power pole	St Vincent's Catholic College

16. Wellard

16.1 Background

Wellard is one of the newer suburbs of Kwinana, along with Bertram, which has continued to expand for the last decade. Due to the suburb being significantly large and diverse, it has been broken up into three neighbourhoods for this study:

- The Village
- Homestead Ridge
- Providence

The focus has been on Homestead Ridge due to the consultation indicating people desire to have footpaths. The estate has been built as a rural setting in an urban region and is a lifestyle location, however, safety is important, and without footpaths people are required to walk on roads. For mothers with prams or people in wheel chairs wanting to meet at community meeting points this is particularly unsafe. Further consultation is required to ascertain perspectives of various members of the community before expenditure.

16.2 Secondary Destinations

One of the key secondary destinations in the City of Kwinana is Wellard Neighbourhood Centre. It is the central meeting point for the Village Wellard, but also desired destination for Homestead Ridge (just over 1km from its central location).

Providence estate is isolated from the Wellard and Kwinana Centres with the Wellard Road missing gap proposed as a key project (project K5 in Table 1.5).

16.3 Local Destinations

Local neighbourhood connectors were determined for each of the three neighbourhoods as follows:

- **Wellard Park** – a community meeting point for Homestead Ridge near the corner of Bertram Road and Wellard Road, footpaths to this location are particularly poor and are the focus of Wellard neighbourhood plan.
- **Abingdon Park** – a community meeting point for The Village estate and to be a focus in the neighbourhood plan prepared for The Village in the next Bike and Walk plan.
- **Bulrush Park** – a community meeting point for Providence estate and to be a focus in the neighbourhood plan prepared for Providence in the long-term consideration.

Local neighbourhood connectors were also determined for Emerald Park and Sunrise estates, which form the Providence neighbourhood: the central parks on Gemstone Parade and Serenity Street respectively. Connections to these destinations should be sort in neighbourhood plans prepared for this area within the long-term consideration.

16.4 Wellard Neighbourhood Plans

Table 16.1 and Table 16.2 indicate the implementation plan for the Wellard neighbourhoods focused on Homestead Ridge connections to Wellard Park.

Table 16.1: Homestead Ridge implementation plan

Priority	Project	Destinations
H1	Wellard Road, Wellard (shared path western side) from Bertram Road to Providence Estate	Wellard Park Providence Estate (isolated from Wellard & Kwinana Town Centre)
H2	Silversmith Street – 550m of footpath from Wellard Road to Homestead Drive (liaise with residents to confirm demand and determine the side)	Wellard Park
H3	Stonemason Rise – 230m of footpath from Silvermith Street to pedestrian accessway to Mason Mews (liaise with residents to confirm demand and determine the side)	Wellard Park
H4	Connection from footpath network behind Mason Mews to path network in Wellard Park (liaise with residents to confirm demand)	Wellard Park

Table 16.2: Wellard "The Village" and "Providence" implementation plan

Priority	Project	Destinations
W1	Bicycle parking on The Strand – install 2 U-rails in front of Woolworths, one U-rail in front of Bliss & Momos Café, one U-rail at Wellard Square entrance (liaise with shop owners regarding location)	Wellard Neighbourhood Centre
W2	Bicycle parking in Abingdon Park – one U-rail at playground equipment	Abingdon Park
W3	Mortimer Road, Wellard (shared path south side) from Johnson Road to Kwinana Freeway	Kwinana Freeway
W4	Study of cycling and walking access to new Wellard Primary school	Wellard Primary School

17. Orelia

17.1 Background

To allow for the other strategic projects and demonstration neighbourhoods to receive the focus of funding, Orelia has limited focus in the implementation plan.

It is proposed to focus on Wellard and Orelia more significantly in the 2023 cycling and walking plan as the consultation revealed the community did not have significant complaints with the pedestrian and cycling network in Orelia.

The City of Kwinana project to resurface Orelia Drive in 2018/19 provided the opportunity to upgrade the infrastructure to red asphalt cycle lanes and widen where possible.

17.2 Secondary Destinations

The key secondary destinations close to Orelia are Darius Wells Library and Kwinana Adventure Park. The western part of Orelia is within 1-2km of these premier destinations and walking distance or cycling distance for people.

Gilmore College is officially in Orelia, but due to its importance and central location, many sources, including this plan, identify it in the City Centre. Its catchment is the entire City of Kwinana, however, many residents in Orelia can easily walk or cycle there due to its proximity. Future neighbourhood planning for Orelia should focus on cycling and walking to Gilmore College along with the primary schools in the area.

17.3 Local Destinations

Local neighbourhood connectors were determined for each of the three neighbourhoods as follows:

- **Orelia Shopping Centre** – a community meeting point for Orelia, requiring upgrade and expected in the near future (bicycle parking is poor and recommended to be added this implementation phase).
- **Orelia Park** – a community meeting point for Orelia and to be a focus in the neighbourhood plan prepared in the next Bike and Walk Plan.
- **Hennessey Park** – a community meeting point for Orelia and to be a focus in the neighbourhood plan prepared in the next Bike and Walk Plan.

17.4 Orelia Neighbourhood Plan

Table 17.1: Orelia implementation plan

Priority	Project	Destinations
O1	Orelia Avenue bicycle lanes (resurface cycle lanes from Thomas Road to Christmas Avenue)	Loop Trail Orelia Park
O2	Orelia Shopping Centre bicycle parking	Orelia Shopping Centre
O3	Langridge Crescent (Butt Place to Littemore Road)	Littlemore Park

Orelia Avenue

The existing shoulders that serve as pseudo bicycle lanes should be retained as part of upgrade works to Orelia Avenue, however, they should be resurfaced in red oxide to provide additional delineation and need protection as minimum. Where practical, the width of the shoulders should be increased at the expense of the traffic lane, with liaison required with the Public Transport Authority due to this being a bus route. The lighting in the central median, along with the trees on the western side and steep embankment, mean widening for a 2-way separated lane is impractical for the benefit required. Alternative north-south routes need to be sought in future neighbourhood planning for Orelia.

Connections to Secondary Routes

The focus of subsequent neighbourhood cycling and walking planning for Orelia should be to connect the local network into the secondary route from Kwinana Train Station to Kwinana City Centre on Sulphur Road, Parmelia Avenue, Warner Road etc. Roads like Orelia Avenue, Crawford Road, Hennessey Avenue and Colchester Avenue are expected to become important local connections into the secondary route.

RECOMMENDATION 7: Implement all neighbourhood plans.

18. New Development East of Kwinana Freeway

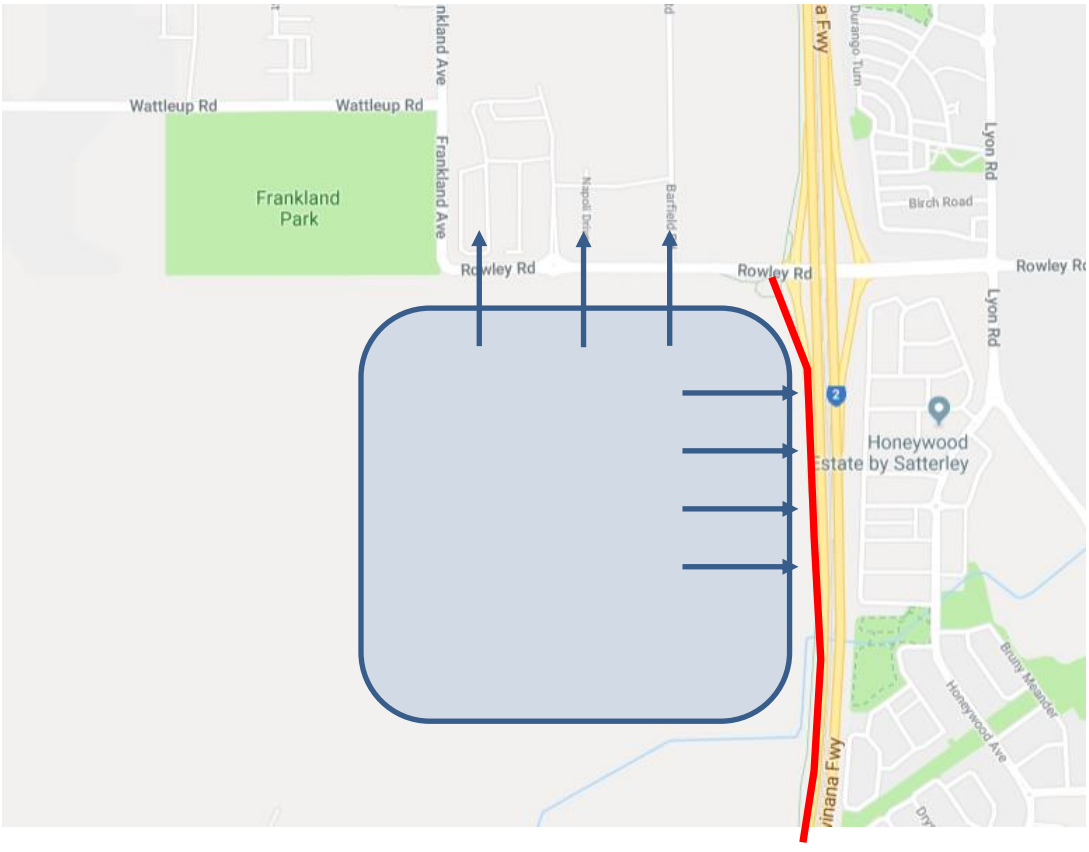
18.1 Background

Wandi, Casuarina, Mandogalup and Wellard East are earmarked for development from semi-rural land into residential housing estates at a rapid pace, for the next 20 years and will provide much of the additional 40,000 people forecast for the City of Kwinana. Therefore, it is paramount that infrastructure be developed that will sustain a bicycle and pedestrian network for the long term. Some developers take initiative to design strong cycling and walking infrastructure into subdivisional developments, while others search for ways to provide the minimum to reduce expenditure. Either way, it is well appreciated that active travel is a selling point on advertising material for new estates.

18.2 Mandogalup Estate

Starting from the north of Kwinana and to the west of the freeway, is the new development proposed by Qube in Mandogalup. Two important aspects of this development are the connections to Hammond Park in the City of Cockburn, and to the Kwinana Freeway PSP. Often developments provide large noise walls with limited access points, reducing the potential for people to cycle to secondary destinations along the primary routes. Every 4-500m there should be connections to the primary route.

Figure 18.1: Mandogalup connectivity to PSP and City of Cockburn



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Another aspect of the subdivisional development is the standard of the infrastructure. Qube developments have indicated its intent to not provide minimum, but desirable standards, including separated facilities with priorities through intersections. This should be supported by the City of Kwinana. Refer to the tool box for design guidance provided in section 20 of this plan.

18.3 Honeywood Estate – Wandi

Wandi is developing from a semi-rural to a residential estate with Honeywood estate being rolled out adjacent to the freeway in a prime location to the north of the City. Honeywood has its own local neighbourhood connectors, separate to the semi-rural of Wandi, and both should be connected in the long term.

Wandi had a number of roads suggested for cycling facilities in the *Crowdspot* survey indicating an active community, and that these roads are used for longer cycling trips. It is proposed to construct shared paths or bi-directional cycling facilities on Da Haer Road and Wandi Road as part of developments, and contributions should be appropriately sort from the developer at the time of construction. Further information on these roads is provided in Section 9.4.5.

Honeywood Avenue has become the north-south route and should be used on the secondary route from Wellard to Cockburn Central (Section 9.4.6). Other local routes should feed into this route and to Rowley Road. As the estate continues to the south, the secondary route should be developed and should consider boulevard treatments and speeds of 30km/hr if practical.

18.4 Wellard East – Casuarina

Sunrise estate is one of the first to be developed east of the freeway in Wellard East. It has been considered as part of Providence and Emerald Park neighbourhood area (Section 16).

Further development is occurring and will continue to occur in the Wellard East and Casuarina semi-rural areas. Opportunities to link the north-south route should be explored at all times. Developers must ensure they understand the importance of this route and feed into it and not compromise it for any reason.

RECOMMENDATION 8: Ensure all new developments are built to incorporate the local and secondary networks and connect to City of Cockburn's cycling and walking network.

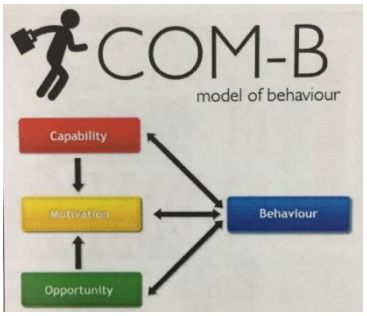
19. Implementing the Bike and Walk Plan

19.1 Supporting the Infrastructure

When developing an active travel community, it is important to provide measures that are non-infrastructure based, but still work toward the goal of changing people's travel behaviours helping them understand there are other viable modal choices. Although people are aware of the benefits of cycling, few people actively cycle or walk as an everyday transport option. Investment in cycling and walking infrastructure needs to be supported through the active promotion of these modes.

Research also suggested that, there are two main issues with changing people's travel behaviour, these being "Habits" and "Infrastructure". It is hard to break a habit if there is no alternative mode opportunity, or there is free parking available, or the existing infrastructure is not conducive to travel behaviour change.

Further, telling people what to do does not always provide the desired outcome as each person's situation and reason for using the car is different. A COM-B behaviour change principle can be considered, understanding a person's Capability, Opportunity and Motivation (COM) and working with this can lead to Behaviour (B) change. While the following identifies some generic proposals for promotion and encouragement, it also provides opportunity for engagement with groups within the community, to understand their capabilities, opportunities for change and motivations.



19.1.1 State Government Policy

The State Government discusses behaviour change within the Perth Transport Plan through "travel behaviour change programs" using education, information, incentives and other marketing-based approaches to persuade and assist people to decrease their need to travel, reduce dependence on private cars and increase physical activity by making voluntary changes in their travel habits and patterns. Such changes include reducing car use and increasing the share of trips by alternatives such as cycling, walking, public transport or car-pooling. Travel behaviour change programs achieve these shifts in demand by changing perceptions or attitudes to alternative travel options. Travel behaviour change programs typically target households, workplaces and schools.

In this regard, the integrated travel behaviour change program *Your Move*, which had its pilot project in neighbouring Cockburn, improves transport system efficiency in the local area by reducing travel demand and shifting travel times, thereby helping better manage local congestion. This program also improves public transport patronage and leverage cycling initiatives to improve infrastructure connections to destinations.

It is also noted, that the recent (August 2016) finalisation of the Western Australian Planning Commission Guidelines for Transport Impact Assessments has a greater requirement for active travel assessment and consideration of amenity.

The City have also indicated that where feasible, they will seek to align promotion activities with the Heart Foundation of Australia. To complement this, it is recommended that the City work with Department of Transport's *Your Move* Program where practicable.

RECOMMENDATION 9: Develop an active transport behaviour change policy and strategy. And work with DoT to implement a 'Your Move Kwinana' program

19.1.2 Encouragement/Promotion

The encouragement and promotion of cycling should seek to appeal to all members of the community with non-cyclists encouraged to consider cycling for leisure/recreational trips as well as every day trips; whilst existing leisure/recreational cyclists should be encouraged to cycle more often for everyday trips – such as commuting and accessing local facilities.

Programs aimed at encouraging cycling and walking need to promote the benefits and enjoyment and provide a positive image of cycling and walking. A range of suggested actions may include:

- Marketing the benefits of cycling and walking.
- Working with local schools to:
    - promote Safer Routes to School;
    - Bike and ride or "bike bus" (where riders group together) programs encouraging parents to ride to school with their children;
    - Ride to school programs and cycle proficiency training for school children; and
    - Assistance for schools wanting to participate in training and maintenance courses.
- Ensuring this Neighbourhood Bicycle and Walking Plan remains an active document endorsed and implemented by the City.
- Supporting development that encourages and/or caters for cycling and walking within its plan and design.
- Developing cycle parking standards/end of trip facility requirements that need to be adhered to for planning approval.
- Coordinate local community events aimed at promoting cycling and walking – based around new Active Travel Infrastructure and community facilities.
- Host Launch day events for new facilities – a launch day ride might include an organised ride that includes new infrastructure and linked sections of the existing network.
- Joint programs with local businesses to encourage use of cycling for short trips through incentive schemes.
- Open Street programs, such as Town of Victoria Park closure of certain roads to general traffic on a Sunday – such as Chisham Avenue within the City.
- "Welcome Wagon" concept – this is where the City would provide a welcome pack to all new residents and to new council staff that includes information and maps of all existing alternative travel modes.

Cycle Tourism

The idea of cycle tourism and "Guide Rides" is something that was discussed during the community consultation workshops. It was noted that cycle tourism was becoming increasingly popular with overseas travellers and tourists. In this regard, several Cycle Tour suggestions were provided, as follows:

- A Link to Fremantle and the Cruise Ship terminal.
- Look to surface some of the Kwinana Loop Trail to make it accessible for both walking and cycling.
- Possible themed cycle and walking tours, such as:
    - A Wetlands Tour - utilising the proposed Recreational Routes;
    - A Bushlands Tour – utilising the large amount of Bushland surrounding Kwinana;
    - Tramways Trail which is identified in section 9.5;
    - A Kwinana Indigenous Tour; and
    - A longer "loop" trail, such as linking Kwinana, Rockingham Coast and Kwinana Freeway.

The City, possibly partnering with neighbouring authorities such as Cockburn, could produce maps and guides which would:

- enable self-guided tours;
- connect local routes to regional routes;
- allow adequate rest stops and to provide branded bikes in partnerships with local companies; and
- engage with local tour guide companies to lead groups on tours using their own bikes.

RECOMMENDATION 10: Investigate the feasibility and routing options for potential cycle or walking tours

19.1.3 Cycle Skills Training

It is well understood that people who have enjoyed the experience of cycling as a child are more likely to pick it back up as part of their transport behaviour as adults.

Education of users in respect to traffic rules and responsibilities is necessary in order to provide safer and courteous behaviour. In addition, education relating to cycle maintenance, safety precautions and practical skills in relation to other traffic is also needed.

Accordingly, the City should seek to work with Department of Transport and the Department of Education to try and identify suitable children's riding skills courses and potential funding mechanisms to deliver the training. In addition, the City should also seek to work with the Department of Transport, the Australian Bicycle Council and the Department of Environment, Water, Heritage and the Arts with respect to adult cycle proficiency training. As part of this, the Amy Gillet Foundation, the Bicycle Federation of Australia and Cycling Australia came together to create *AustCycle*, in 2008, to provide train-the-trainer and accreditation systems for both children and adult cycle training, through a commercially viable cycling training sector. *AustCycle* was superseded in 2016 by the *Lets Ride* and *She Rides* programs.

Education should also be aimed at both motorists and pedestrians with respect to the needs and likely behaviour of cyclists. Pedestrians and cyclists also need guidance on safe path sharing – this is particularly true given the amount of existing and proposed shared paths throughout the City, which is likely to result in an increased number of pedestrian/cycle interactions.

19.1.4 Enforcement

The Police Service enforces the Road Traffic Act and Codes that relate to cycling. The Police also help educate cyclists and motorists about the rights and responsibilities of all road users.

Whilst enforcement by police patrols may enhance user security – for instance on shared paths – such measures are often expensive to undertake unless dedicated bike mounted patrols exist. The City can address this through education and encouragement of desired behaviours, addressing conflicts between cyclists and pedestrians within shared environments.

Path way behaviour management can assist in this regard – Figure 19.1 illustrates suggested signage.

Figure 19.1: Suggested enforcement signage

G9-259-1
(a) *Keep Left* sign encourages all path users to travel on the left

G9-259-2
(b) *Warn When Approaching* sign encourages path users to call out or use their bells

G9-259-3
(c) *Stop Off Path* sign encourages path users to keep the path clear

G9-259-4
(d) *Control Your Dog* sign reminds dog owners of their responsibilities

19.2 Monitoring and Evaluating

It is important to undertake sufficient monitoring and evaluation throughout the implementation of this plan. This can be undertaken by the following means:

- Documenting the implementation of actions recommended in this and the previous bike plan;
- Annual bike counts at key locations;
- Annual review of crash statistics specifically reported bicycle and pedestrian crashes (via Main Roads Western Australia Data Base or the Road Safety Commission Reporting); and
- Holding and supporting various events.

In addition, consideration could be given to installing permanent counters in the longer term as part of construction of regionally focussed paths or key local centre routes. Counters may need to be designed to collect data for both pedestrians and cyclists, noting that pedestrian volumes often outweigh bike volumes (e.g. Kwinana Loop Trail). To promote bicycle use, consideration could be given to visual displays integrated with the counters.

These activities provide the necessary data to continually evaluate the success of the *Bike and Walk Plan* to inform the priorities of future investment.

Figure 19.2: Bicycle barometer on Barrack Street, City of Perth

Figure 19.3: Bicycle barometer in Moreland, VIC

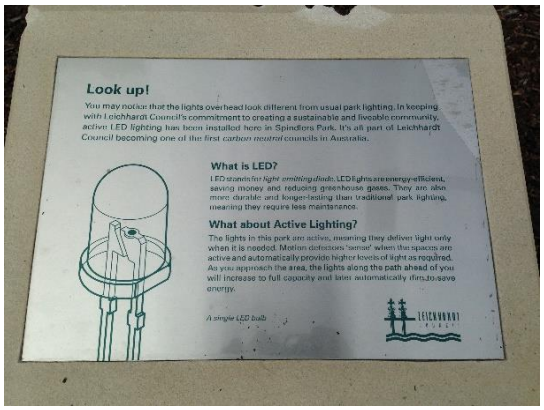
RECOMMENDATION 11: Undertake annual crash investigation study for key hotspot cycle pedestrian crash areas to understand causality making cycling/pedestrian safer

RECOMMENDATION 12: Develop a counting and monitoring strategy for cyclist and pedestrians

19.3 Innovation – Utilising Technology

The use of technology can assist in monitoring the use of new infrastructure as well as improve the connectivity and safety of infrastructure, such as *active lighting*. Active lighting refers to light that is only delivered when it is needed. Motion detectors "sense" when the spaces are active and automatically provide higher levels of light as required (Figure 19.4). As a person approaches the area, the lights along the path ahead will increase to full capacity and automatically dims to save energy once the person has left that area.

Figure 19.4: Active lighting in Spindlers Park, NSW



Other future opportunities may include solar pavements which are used in The Netherlands and United States (Figure 19.6 and Figure 19.7).

These types of treatment serve more than an aesthetic function; they improve visibility and could be a means to reduce crime and position the City in the best practice space for Western Australia for innovative means to make cycling and walking safer and more attractive.

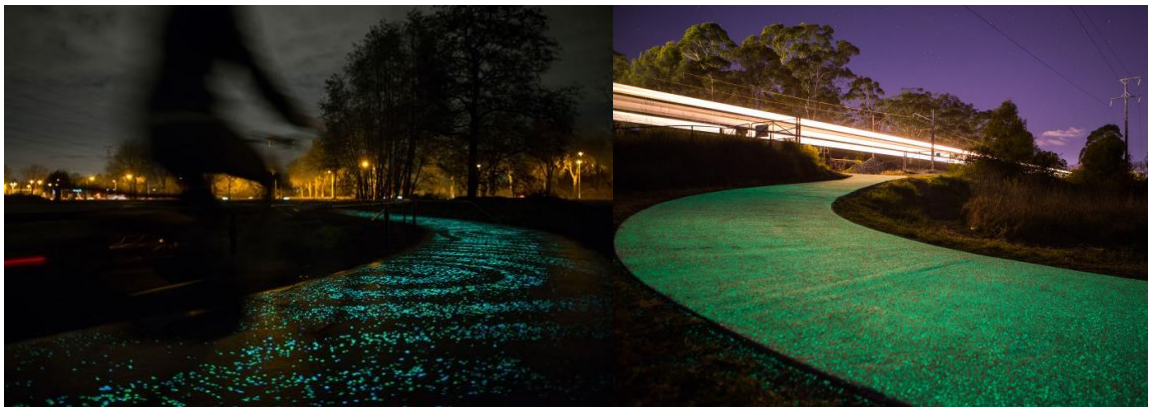
Figure 19.5: Solar pavement, Krommenie, The Netherlands

Source: http://motherboard.vice.com/nl/read/in-noord-holland-komt-het-allereerste-fietspad-met-zonnepanelen-?utm_source=motherboardfb

Figure 19.6: Solar driveway, USA

Source: https://www.youtube.com/watch?v=qlTA3rnpgzU

Figure 19.7: In-Ground LED artwork, Eindhoven, The Netherlands



19.3.1 Provision for electric bikes

As the use of Electric Bikes (E-Bikes) becomes more popular, allowing riders to travel longer distances and along steeper gradients in comfort, it will be increasingly important to provide charging stations to ensure riders can complete longer journeys. As such, the City will need to consider the use of E-Bikes within the south-west metropolitan area, and work with neighbouring authorities and the South West Group to install an E-Bike cycle route, in much the same vein as the RAC implemented the Electric Highway through the south-west of WA.

RECOMMENDATION 13: Work with the South West Group to investigate an E-Bike Route.

19.4 Wayfinding signage

As part of the *CrowdSpot* survey a number of people mentioned the need to improve the wayfinding signage particularly around the Kwinana Loop Trail. As part of the promotion of the plan, a Wayfinding Strategy is recommended.

Signage is a critical part of an accessible, safe and connected cycling and walking network. Signage improves the efficiency of the network and thus enhances the utility of cycling and walking as a transport option. Without clear and legible signage, those who are unfamiliar with the network may feel unsafe or uncertain, and less likely to cycle or walk as a transport option.

To guide the installation of a bicycle network, a focal point map has been developed to achieve consistency in the use of secondary locations. The destinations and trip attractors were identified through feedback gained during consultation. The key principles when undertaking a way-finding strategy include the following:

- **Focal points** – significant locations where regional routes start, finish, join or cross.
- **Destination points** – city centres and localities which are located at the ends of regional bicycle routes but are not at a junction with other regional routes.
- **Key decision points** – network junctions which are intersections-only (not focal points).
- **Sub-destinations** – important local centres along a route.
- **City and town centres** – business centres of cities/ towns.
- **Local destinations** – local trip generators located at the termination of local routes.

Focal points, destination points, sub-destinations, local destinations and town centres shown on the focal points map are the destinations which will be used to guide the installation of signage across the suggested bicycle and pedestrian network.

The principal forms of signage for any Wayfinding Strategy should include:

- **Intersection Fingerboards** –the primary means of indicating the route direction at key decision points. The focal point destination and one other destination are generally shown on each fingerboard, along with distances.
- **Advanced Direction Boards** –placed before an intersection to indicate the route being followed and the route choices available at the following intersection. Destinations and sub destinations are used on advanced direction boards, although distances are never used (however, time-based information may be applicable).
- **Reassurance Boards** –used between key decision points and on longer straight sections to reassure cyclists they are travelling towards their intended destination.

It is recommended that the City consider the following approach to the installation of new signage:

i Signage to be installed in association with all priority routes, with intersection fingerboards installed at all key decision points.

ii Intersection fingerboards to be mounted on existing sign posts, where possible, to reduce street clutter.

iii Redundant bicycle signage to be removed/replaced.

iv The City will liaise with Main Roads Western Australia to ensure consistency between signage.

v The City will liaise with the Cities of Rockingham and Cockburn, where possible, to ensure routes are signed consistently and in particular the destinations used and distances are consistent.

vi New signage will be installed, if required, as part of any major bicycle infrastructure project conducted in the City.

vii The City will need to continually review the wayfinding signage (in accordance to an overall strategy) as more routes and links are implemented.

RECOMMENDATION 14: Implement Behaviour Change Initiatives and Way Finding Signage Strategy including around Kwinana and Wellard Train Stations

A demonstration project on Sulphur Road is proposed (see section 0) to apply pavement marking treatments to the existing environment and signage to indicate the destinations of Kwinana City Centre and Train Station, and to distinguish between on-road shoulder and the access road and path used.

19.5 Non-Active-Travel Behaviour Change Mechanisms

While this plan provides cycle and walking infrastructure proposals, as well as non-infrastructure based active travel promotion, there are also mechanisms the City can utilise to further encourage the use of active and public transport travel. These may include:

- Car Exclusion Zones around schools (nominally a 200m buffer but can be more) – this could be incorporated with a Safer Routes to School program as well as utilising any nearby public car parks for parents to park and walk. An example of a school exclusion zone can be found in New South Wales, on Brabyn Street, Denistone East.
- Town Centre Car Parking Strategy to incorporate managed and paid parking (providing a financial incentive for active travel over car use) to be delivered in conjunction with the implementation of the town centre masterplan.
- Area wide Developer Contribution Strategy, collecting funding from multiple developments toward cycling and walking infrastructure.
- More street trees to provide a consistent canopy of shade and to cool the streets down. Trees planted within the road side verge is preferred. However, trees planted within the road carriageway will also cool the streets down and provide shade.

20. Implementing the Neighbourhood Bike and Walking Plan – A Tool Box of Measures

20.1 Introduction

Infrastructure must be tailored to the demand and type of users. This has been detailed in Chapter 8. Pedestrians are generally less diverse in behaviour and requirement compared to people cycling. However, there still needs to be consideration of whether prams and gophers are expected. Where this is so, the width is to be wider; this plan proposes 2m for such paths (above the 1.8m min standard).

For cycling, the treatments vary from on-road treatments to bi-directional cycling facilities to paths shared with pedestrians. Even though people can cycle on footpaths legally, with recent legislative changes, this plan proposes to separate cycling from walking networks by the definition of shared path which is 2.5m wide, as a minimum.

This tool-box provides information for designers in the City, to the standards and requirements for each of the treatments proposed in the plan.

20.2 Bi-Directional Separated Bicycle Path

Bi-directional (or two-way) separated bicycle paths are located within the road reserve but are exclusive to bicycles. They are separate from parked cars, vehicle traffic and pedestrians. These facilities provide bi-directional travel along one side of the road and are highly desirable and safer than other on-road options.

These facilities often require substantial engineering works to implement, which needs to be balanced relative to competing demands for space within the road reserve. This type of facility is the preferred infrastructure type for major routes. It is chosen over a shared path when the number of people cycling is expected to be considerable and shared path interaction with pedestrians could become problematic. Where the road is less than 3,000 vehicles per day, a Safe Active Street treatment should be considered.

Design Requirement: 3.0m width (2 x 1.5m lanes) or 2.5m absolute minimum for local path access.

Chisham Avenue is proposed for a bi-directional facility on the north side and will require substantial road re-configuration.

Banksia Terrace, Kensington is an early example of this type of facility

20.3 Safe Active Street

The Safe Active Streets program is an innovative program designed to make cycling safer and easier in Western Australia, largely consisting of a new cycle infrastructure treatment known as Bicycle Boulevards. Bicycle Boulevards need to be located on local streets with low traffic volumes (less than 3,000vpd) and speeds (30km/hr or less), providing bike riders with safe and comfortable bike routes with priority over cars, and an easy, on-street link to local destinations or major bike routes. The lower speed road creates a safer environment for pedestrians, cyclists and motorists.

Examples of safe active streets in Perth include:

- Shakespeare Street, Mount Hawthorn
- Leake Street, Bayswater

A number of other new streets in various local governments around Perth are undergoing transformation into safe active streets through funding assistance with the Department of Transport. The City of Kwinana is set to undergo this same transformation with streets proposed as follows, noting Medina is proposed to be a demonstration suburb.

Table 20.1: Safe Active Streets proposed, City of Kwinana

Medina	Parmelia	Leda
Atkinson Road	Hunt Place	Sloan Drive (north of Harman)
Wheelock Road	Cowling Way	Porter Gardens
Harley Way	Preston Road	Bilya Gardens
Bingfield Road West	Adamson Road (east of Preston)	McNairn Cross
Tucker Street (north of Hubbard)	Sicklemore Road (north of Adamson	Yeovil Way
Hubbard Street	Dawson Way	
Westcott Road	Champion Drive, Bertram (Mangart Road to Hero Crescent)	
Pace Road (west of Harley)		
Kirkus Road		

20.4 Bicycle Lanes

Bicycle lanes are the treatment historically used for roads with significant vehicle volumes to delineate space on the road. It is now a treatment less preferred to Safe Active Streets, bi-directional separated paths, and protected bicycle lanes.

Traditional bicycle lanes should be used sparingly, such as on Orelia Drive, where space restrictions prohibit improved treatments as mentioned above. The Department of Transport does not support unprotected bicycle lanes and will not provide grant funding unless lanes have some form of physical protection.

For new on-road cycle routes, it is recommended that all routes are designed to a standard of 1.5m in width, widening to 1.8m where possible, particularly on uphill sections where gradient is likely to be >5%. While it is acknowledged that Austroads Guide to Road Design Part 6A states that a bicycle lane can be 1.2m wide (with an absolute minimum of 1.0m for very short sections) – the City should consider using 1.5m as standard, reducing to 1.2m as a minimum.

Design Requirement: 1.5m lanes, 1.2m lanes as minimum, 1.8m lanes where possible.

Green treatments through intersections should be adopted on local distributor or roads of higher volumes, to ensure car drivers are more aware of people cycling across intersections.

RECOMMENDATION 15: Coloured surfacing for on-road cycling. Providing Green at conflict points as a minimum. Use the cycle symbol pavement marking on all on-road routes.

20.5 Footpaths and Shared Paths

With the recent change in legislation to allow cycling on footpaths, there is a little blur in the requirements of local government to build shared paths with designated pavement marking to denote shared path status.

For the City of Kwinana, the provision of shared paths should be constructed to 2.5m width when there are perceived to be 300 or more cyclists per day riding. Where there is expected to be considerable pedestrians, such as around café strips or aged care facilities, footpaths should be adopted as the treatment and the local authority should take care to protect pedestrians from people cycling and create safer road environments adjacent to the footpaths. The Department of Transport is recommending 3m shared paths for areas of activity to future proof the network and are not likely to fund path widths below this effective width (including clearances).

Main Roads cycling level of service guidelines, provide further assistance, recognising they have not been updated for 10 years and do not reflect latest best practice treatments.

https://www.mainroads.wa.gov.au/Documents/los_guidelines_cycling.RCN-D06%5E2347971.PDF

21. Conclusion

The City of Kwinana has opted to produce a plan to enhance neighbourhood's walkability and cyclability networks for small 1-2km trips. The focus for the implementation plan has been on:

- A pedestrian plan for Bertram – to address its significant deficiencies identified in the *CrowdSpot* consultation.
- Medina neighbourhood plan – focusing on an east-west local route across the suburb.
- Leda neighbourhood plan – focusing on footpaths to parks to improve community connectivity and establishing meeting points.
- Secondary route from Kwinana Train Station to Kwinana City Centre.
- Design of secondary routes from Kwinana Train Station to Wellard Road (on route to Rockingham Station), and from Kwinana City Centre to Wells Park (on route to Rockingham Foreshore).
- Design guidance for development of the eastern semi-rural part of the local government to ensure bicycle networks connect.
- Implementation plans across the local government.

The top 5 projects across the entire local government have been prioritised for implementation before the neighbourhood plans, but closely align to a number of the neighbourhood plans. They should be delivered as a priority due to the safety importance and level of demand in the local community. These projects are:

- Tranby Way footpath (both sides of road), Bertram – connection to Bertram Primary School.
- Walgreen Crescent footpath (south side), Calista – connection to Kwinana Adventure Park.
- Rowley Road shared path (south side), Wandi – connection to Freeway PSP from Honeywood community.
- Thomas Road shared path (south side), Casuarina – connection to Kwinana from Marri Park community.
- Wellard Road shared path (west side), Wellard – connection to Kwinana from Providence and Homestead Ridge estates.

Table 21.1 on the following page provides a summary of all recommendations made in this plan.

Table 21.1: Recommendations for the Kwinana Bike and Walk Plan

Recommendations	
1	Local route planning to be prepared for Parmelia, Wellard and Orelia
2	Liaise with Department of Transport about long-term priority to construct shared path on east side of freeway at local standard (3m wide)
3	Liaise with Department of Transport about provision of a Principal Shared Path (PSP) on the freight route for the long-term regional cycling network
4	Implement Kwinana Train Station to Kwinana City Centre secondary route in the implementation plan
5	Implement Kwinana Train Station to Rockingham Train Station secondary route in the implementation plan subject to Department of Transport funding (City of Kwinana section)
6	Prepare a separate Footpath and Cycling Plan for the industrial areas of Kwinana
7	Implement all neighbourhood plans
8	Ensure all new developments are built to incorporate the local and secondary networks, and connect to Cockburn's network
9	Develop an active transport behaviour change policy and strategy. And work with DoT to implement a 'Your Move Kwinana' program
10	Investigate the feasibility and routing options for potential cycle or walking tours
11	Undertake annual crash investigation study for key hotspot cycle pedestrian crash areas to understand causality, making cycling/pedestrian safer
12	Develop a counting and monitoring strategy for cyclist and pedestrians
13	Work with the South West Group to investigate an E-Bike Route
14	Implement Behaviour Change Initiatives and Way Finding Signage Strategy including around Railway Stations
15	Coloured surfacing for on-road cycling. Providing Green at conflict points as a minimum. Use the cycle symbol pavement marking on all on-road routes.

Appendix A

Strategic Guidance

A.1 Strategic Guidance

City of Kwinana Strategic Documents

2010 City of Kwinana Bike Plan

The City of Kwinana Bike Plan 2010 prepared a plan for the implementation of two interconnected systems of pathways, consisting of off-road shared paths for 'casual cyclists' (as termed by the consultant) and primarily on-road cycle lanes for commuting cyclists. The 'casual' cycling network was proposed to consist of an interconnected system of 2-meter-wide shared paths linking schools, shops, recreation and residential. The 'commuter' network consisted mainly of on-road facilities through the suburban parts of Kwinana.

Several projects identified within the 2010 plan have been implemented, either by the City or Main Roads WA. This if further detailed within section 4 on in this plan.

City of Kwinana – Strategic Community Plan 2017 to 2027

The City's strategic community Plan is founded on four visionary priorities which represents the community's aspirations for the future and defines what it will be like to live in Kwinana by the year 2030. These priorities are as follows;

- Rich in spirit.
- Alive with opportunities.
- Nature, preserve and enhance.
- It's all here, services, facilities, diverse lifestyles.

The plan imposes a proactive and strategic approach to planning for significant infrastructure needed for the future, such as major road networks, waste disposal/recycling facilities and ensure that project timeframes are matched to population growth. This in essence is meant to provide a safe and efficient integrated network of roads, footpaths and cycle routes supported by a good public transport system. The plan also advocates constructing and maintaining a safe and legible network of footpaths and cycle routes to enable residents to get where they need to go safely and easily.

City of Kwinana - Public-Health-Plan-2015-2018

The Public Health Plan has been developed to complement rather than duplicate Council's existing planning frameworks and strategies. As such, it has been designed collectively with community input and was driven by the City's Strategic Community Plan. It aligns the following four themes with the four priorities of the Community Strategic Plan:

- Healthy People
- Healthy Places
- Healthy Marketing and Promotion
- Healthy Partnerships

It has also been led by the current community health profile prepared by South Metropolitan Health Unit in 2013. Some of the most concerning health statistics occurring in Kwinana are the highest rate of Type II diabetes, the highest rate of cholesterol and the highest rate of mental and behavioural problems, in Australia, as well as the highest percentage of women who smoke during pregnancy, referencing Data from the Curtin University Geospatial Report 2014.

The Plan aims to address the physical, social, cultural and economic factors impacting on people's health and wellbeing, especially for those in the community at risk. It capitalises on the Strategic Community Plan aims and priorities by promoting a safe and efficient integrated

network of roads, footpaths and cycle routes, supported by a good public transport system. According to the plan, this would be achieved by:

- Creating Policies and reviewing the current Bike Plan to ensure bike and pedestrian routes are prioritized as modes of transport.
- Setting a standard for road layout that puts cyclists and pedestrians ahead of the car, by ensuring planning in early stages to ensure networks are efficient and safe for every user.
- Inspiring the provision of efficient cycleways and footpaths in newly developed areas, and upgrades to existing transport networks that enable active transport.

City of Kwinana Draft Town Centre Master Plan 2017 / Local Planning Policy

The focus of this Policy is on the City Centre Zone, which is bound by Sulphur Road in the north, Gilmore Avenue to the west, Meares Avenue to the east and Challenger Avenue to the south. The City's Town Centre Local Planning Policy details design provisions to complement the land use and development requirements prescribed in Local Planning Scheme No. 3 for the Kwinana City Centre. This policy has been prepared to assist in achieving the vision and four objectives set out in the Strategic Community Plan. Objectives of the movement network framework are set as follows;

- **Establish an appropriate balance between vehicle and pedestrian movement, providing safety for pedestrians and accessibility for vehicles;**
- Ensure appropriate building height to street width ratio, creating a sense of enclosure and definition to street, reinforcing street types by capacity and character;
- Ensure vehicle movement is convenient and efficient, with safe access and parking;
- Ensure on-site vehicle parking and access is appropriately located, minimising the adverse visual impact on the streetscape;
- **Reinforce connections to the public transport network; and**
- **Improve walking and cycling conditions to link destinations serviced by alternative parking facilities.**

Other objectives and design principles highlighted in the policy and directly related to walking and cycling are as follows:

- Establish Chisham Avenue Main Street as the focal point and prime public space of the city centre;
- Reinforcing the significance of Gilmore Avenue as the major approach and gateway to the city centre, linking through to the Chisham Avenue Main Street;
- Reinforcing the central pedestrian north-south spine and establish east-west pedestrian priority routes;
- Improve pedestrian permeability through to the southern precinct and proposed new residential development;
- North-south pedestrian movement linking the civic precinct in the north and Hub precinct in the south;
- Regular tree planting along the footpath paving with good canopy coverage providing a continuous line of site down Monument Parade;
- Continuous high-quality Main Street environment, with generous uncluttered footpaths providing sufficient space for alfresco seating and pedestrian movement; and
- Providing convenient, safe and attractive pedestrian and cycle links that connect to the city centre and its public transport node, and to nearby parks, waterfront public open space, education, recreation and community facilities.

Table A.1: Town Centre Masterplan Movement Network Framework

Element	Development Controls	Design Guidance
Chisham Avenue	○ New development on the lower levels shall be designed to reinforce the significance of Chisham Avenue Main Street frontages. ○ No vehicle access, blank walls and/or service areas shall be located on Chisham Avenue frontages. ○ Vehicle entrance points and services areas are to be integrated into the overall building design and shall be designed to minimize their impact on the pedestrian environment and street vitality. ○ Ground level facades shall provide variation and interest at a human scale along its length. ○ Weather protection for pedestrians shall be provided along Chisham Avenue footpaths, either in the form of awnings, verandas or first floor balconies.	○ Traffic is slowed within the Chisham Precinct – through the provision of wide crossings to assist pedestrian movement and tree planting to create a sense of enclosure to the street ○ Junctions and radii are also tightened within the Chisham Precinct in order to slow down vehicle movement.
Entry Boulevard - Gilmore Avenue	○ New development shall reinforce a built edge onto Gilmore Avenue – supporting a slow speed environment between Chisham Avenue and Sulphur Road. ○ Prioritise pedestrian access across Gilmore Avenue at the key intersections of Sulphur Road, Chisham Avenue and Skerne Street.	○ Reduced speed environment reinforced by edged treatment-built form and trees. ○ A pedestrian priority crossing will be implemented at Skerne Street through the instillation of traffic lights, zebra crossing, extended kerb lines and textured surface - allowing safe and direct access to the proposed skate park and Adventure Play Ground on Calista Oval.

Table A.2: Town Centre Masterplan Desired Character Areas

Element	Guidelines
Civic Precinct	○ Includes the northern portion of the town centre between Gilmore and Meares Avenues. ○ This area exhibits a strong landscape character set within undulating topography creating a physical separation from the city centre. ○ Accommodating the Council Administration, Arts Centre and Police Station, the area is connected by the central north-south pedestrian spine that links through to offices and business incubators at the crest of the hill. ○ Careful location and design of activated frontages and back of house areas will optimize the streetscape quality of the precinct as the primary civic place for Kwinana. ○ The civic administration will be located in a prominent and fitting place with associated public areas for ceremony and celebration. ○ This precinct will also become more liveable and lively with addition of residential apartments offering housing choice for local residents. ○ Streetscape and public realm treatment will also resolve level differences to provide an accessible and attractive place to live, work and play.
Chisham Precinct	○ It extends from Darius Road to the northern edge of The Hub shopping centre, and sits at the heart of the city centre. ○ The Darius Library and Recreation Centre provide key attractions for the local community. However, there is a lack of attractive retail experience along the Chisham Avenue Main Street. ○ The precinct will become a bustling retail and commercial area focused on Chisholm Avenue. ○ The precinct includes the library and adjacent Requatic Centre as well as part of the retail site. ○ It will have a high level of pedestrian activity, slow moving traffic, and a rich mix of uses fronting the street, with comfortable, wide, sheltered footpaths. ○ The public realm will be characterised by significant tree planting to enhance the landscape qualities that are valued in Kwinana. ○ New development fronting streets in this precinct will provide an engaging public space for locals, visitors and workers in the area. ○ Improved connections to the shopping mall, shared spaces with pedestrian priority and on-street car parking, that will be time managed, will provide a more integrated and accessible core to the Kwinana town centre. ○ Residential development will be encouraged, particularly at upper levels, to provide a liveable town centre.

Element	Guidelines
Kwinana Hub Precinct	○ Located to the south of Chisham Avenue, and approximately two thirds of this land is under the private ownership of Shopping Centres Australia, anchored by Woolworths, Big W and Dan Murphy. ○ As the major retail tenant within the city centre, the focus has been on the internal activation of the development with large areas of car parking surrounding the shopping centre. ○ The precinct will continue to be the primary retail focus for the town centre. The built edges of the shopping centre will be enlivened with active frontages connecting key destinations and entrances and reaching out beyond the site and precinct to improve walkability to and through the town centre. ○ It is envisaged that this large landholding will become more intensely developed with deck car parking providing an opportunity to free up peripheral land for residential apartment development with mixed use at ground levels. ○ The shopping centre as the key activity, will evolve to become an integrated and connected part of the town centre where people can move easily between the internal mall environment, the street and out to the precincts beyond. ○ All retail and business development will address public spaces to create a safe, attractive well-landscaped place for people at all times of the day and night.

The framework goes on to identify 'Primary Pedestrian Routes' and Primary Cycling Routes for the City centre.

Table A.3: Town Centre Masterplan Primary Pedestrian and Cycle Routes

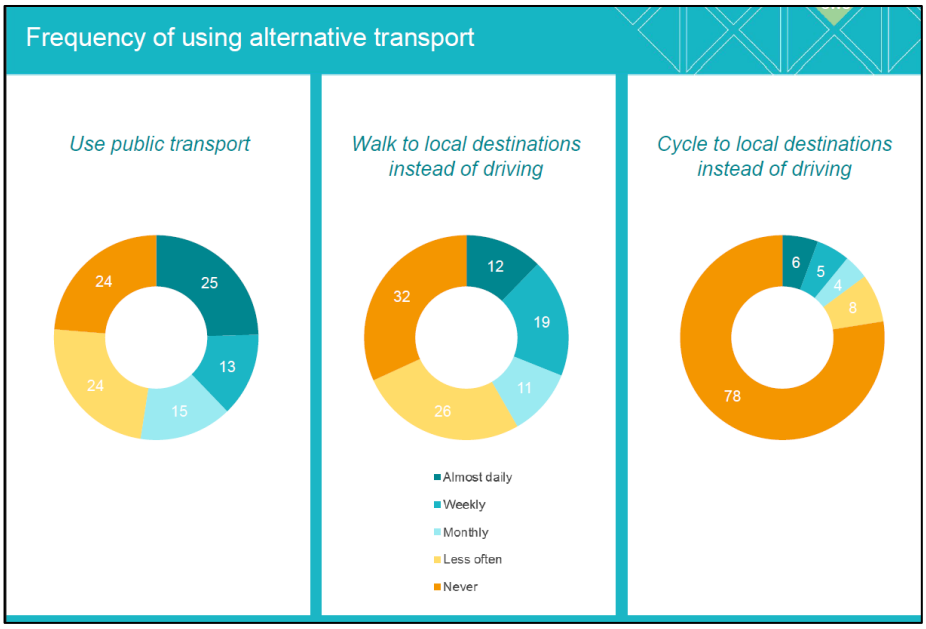
Primary Pedestrian Routes	Primary Cycle Routes	Guidelines
○ Robbos Way ○ Peel Right of Way ○ Skerne Street ○ Chisham Avenue ○ Routes through the shopping centre parking lot	○ Gilmore Avenue ○ Summerton Road ○ Sulphur Road ○ Walgreen Crescent ○ Harlow Road ○ Peel Right of Way ○ Darius Drive ○ Chisham Avenue ○ Meares Avenue ○ Barrick Road ○ Chilcott Street ○ Challenger Avenue	○ Ground level frontages on primary pedestrian links shall incorporate a mix of land uses and design measures to ensure passive surveillance contributing to a safe, active and diverse public realm. ○ Areas of high pedestrian footfall within busy segments of primary pedestrian corridors shall ensure wide pavement fronting onto the public realm. ○ Weather protection shall be integrated with the building design fronting primary pedestrian corridors, appropriately scaled and designed to reinforce the importance of street frontages enabling pedestrian connectivity.

City of Kwinana Wellbeing Scorecard

The Community Wellbeing Scorecard presents the community opinion of "Footpaths and Cycleways" in City of Kwinana and compares it to other areas across Perth. This data illustrates that 78% of respondents would never cycle to local destinations instead of driving. Only 11% cycled daily or weekly.

When asked about walking to local destinations instead of driving 32% said they would never walk with 26% less often. 31% of respondents walked to local destination almost daily or weekly.

Figure A.1: Catalyse Community Wellbeing Scorecard – Transportation response



LOCAL GOVERNMENT SUMMARY

The various local government reports have a common theme with each one noting the requirement for the City to provide a **connected** and **safe** network for cyclists and pedestrians. As well as planning for active travel and ensuring provision of cycling and walking infrastructure is allowed for in newly developed areas. The *Town Centre Masterplan* notes a number of corridors identified for cycling and walking priority.

Western Australia Strategic Documents

Western Australian Bicycle Network Plan

The Western Australian Bicycle Network Plan 2014-2031 (WABN Plan) has been developed to leave a legacy for all current and future cyclists. It includes new initiatives which cover a range of activities to efficiently provide a safe and sustainable cycling network which ties in with key activity and attraction areas.

The vision of the WABN Plan is to make WA a place where cycling is safe, connected, convenient and a widely-accepted form of transport.

The objectives of the WABN Plan take a whole-of government approach to cycling and are complementary to the National Cycling Strategy 2011-2016.

The objectives are to:

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

The key infrastructure actions of the WABN Plan are:

- Expansion of the Principal Shared Path (PSP) Network
- Review of Local Bicycle Routes
- 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

Perth and Peel @3.5 Million Transport Plan

The State Government has prepared a long-term Transport Plan that sets the vision for a generational change to Perth's transport network. It provides a long-term plan for transport infrastructure and considers how we can use the transport network more efficiently as Perth's population approaches 3.5 million and beyond (nominally 2050). The plan looks at where people will live and work when as the population reaches 3.5 million and outlines a workable transport system so that people and freight can keep moving as the city grows.

The transport plan is needed to identify the transport infrastructure requirements of an additional 1.4 million people. It will also ensure that existing and growing centres of population in the Perth and Peel regions have appropriate transport options in the future.

The PTP has a vision for the future transport network; designed to keep the city moving as it grows and help Perth to continue to be one of the most liveable cities in the world.

The Western Australian Government recognises that an integrated approach to land use and transport planning is essential to ensure Western Australia's ongoing prosperity. Integrated land use and transport planning is one of the most cost-effective ways to optimise the performance of critical infrastructure, maximise use of latent capacity within existing land reserves, and facilitate the pipeline of investment needed to build new infrastructure to accommodate future growth.

The infrastructure proposed within the transport plan is presented in Table by mode type, with the following infrastructure proposed for the City of Kwinana:

Table A.4: PTP Proposals for City of Kwinana

Freight	Public Transport	Cycling	Road
Rowley Road Extension (Strategic Freight Road) - Container and general cargo port development in the Outer Harbour (Cockburn Sound) to be serviced by the Rowley Road Transport Corridor and integrated with **an intermodal logistics centre at Latitude 32 Industry Zone.** Rowley Road (west of the Kwinana Freeway) is proposed to be a strategic freight road. It will be extended and upgraded to provide an 8 kilometre four-lane dual carriageway to the coast. A portion of the road will go through the Latitude 32 Industry Zone. The new road reserve will be a Primary Regional Road reserve in the Metropolitan Region Scheme. It will have controlled access status and incorporate interchanges or grade separated junctions at major intersections.	Thornlie Line Extension	**Proposed Local Routes:** Rowley Rd Beeliar East - Fwy Connection Hammond Park – Wattelup Mandogalup Dr Mortimer Rd Kwinana Town Centre - Mitchell Fwy Kwinana Beeliar - Kwinana Beach Wellard Rd	Fremantle Rockingham Controlled Access Highway (Stock Road)
Stock Road - will be upgraded to full freeway standard south of the Roe Highway. It will be aligned into the future Fremantle Rockingham Controlled Access Highway to provide a linkage to the Kwinana Freeway via Mundijong Road at the southern end and the Fremantle Inner Harbour at the northern end via the Fremantle Tunnel.	Cockburn Coast to Rockingham Bus Priority	**Proposed Strategic Routes:** Byford - Kwinana Fwy PSP Thomas Road Wellard Rd – Baldivis Rd	Rowley Road Extension to link to Western Trade Coast
Other new and upgraded links across Perth's south-west including; Widening of Kwinana Freeway to 6 lanes. the upgrade of Anketell Road (Strategic Freight Road) to four lane dual carriageway. the construction of the new Fremantle Tunnel and a new north-south link – the Fremantle Rockingham Controlled Access Highway. Widening and extension of Thomas Rd (Freight Road) to Rockingham Controlled Access Highway. **New grade separations required between** Rowley Rd/Stock Rd, Anketel Rd/Stock Rd, and Thomas Rd extension/Stock Rd/ Rockingham Controlled Access Highway **RAV Upgrades –** Rockingham Rd, Stock Rd, Rowley Rd, and Anketel Rd will be upgraded to RAV 7	Bunbury Fast Train	**Proposed PSP:** Kwinana Stn – Rockingham Mandurah PSP : Rowley Road - Anketell Road Mandurah PSP: Anketell Road - Thomas Road Mandurah PSP: Thomas Road - Mandjoogoordap Drive	Cockburn Road Upgrade to 4 lanes
Rail Access - to the future container port facilities is planned to connect to the existing Cockburn to Kwinana freight mainline through the Latitude 32 Industry Zone. The rail alignment will follow the western section of the road alignment within the Rowley Road Transport Corridor.	High Priority Transport Corridor on Thomas Rd	**Planned PSP:** Rockingham - Point Walter (Stock Road)	
Infrastructure upgrades by 2.7m - Additional infrastructure required to address capacity issues at the Kwinana Triangle to serve the Kwinana Industrial Area	High Frequency Transport Corridor on Rockingham Rd/Patterson Rd	**Proposed RSP:** Beeliar Wetlands West	
Infrastructure upgrades by 3.5m Track duplication between Cockburn Triangle and the Latitude 32 Industry Zone Track duplication between the Latitude 32 Industry Zone and the Kwinana Triangle within the Kwinana Industrial Area			
Expanding the Metropolitan Intermodal Terminal System Expand Perth's intermodal terminal network by facilitating development of a new open-access intermodal terminal facility at Kewdale Terminal Two (T2) to serve as a central hub for international container trade An integrated planning program to develop a major intermodal logistics centre at Latitude 32 to serve the future container port facilities and the State's freight and logistics industry			

South Metropolitan Sub-Regional Framework

The objective is to provide an efficient and effective regional movement network for people and freight that is integrated with land uses, links key employment opportunities and connects the sub-region to the greater Perth and Peel regions as well as the south-west of the State.

- A strategic link between areas north and south of the river is currently being investigated. This link connects industrial and logistics areas north and south with the existing Fremantle Port, the future Outer Harbour and Latitude 32.
- A new north-south route connecting Spearwood and Gilmore Avenues with opportunities for a lateral connection to the potential north-south route is proposed.
- Coastal Area within Cockburn Sound, between James Point and Naval Base, is the most suitable location for development of additional container port facilities.
- **Provision of a network of paths for cyclists and pedestrians offering commuters an alternative to private car trips as well as providing recreation opportunities and health benefits.**

STATE GOVERNMENT SUMMARY

The common theme through the documents released by State Government is the importance of encouraging cycling and waking to build a more active and healthy community, specifically identifying **connections to schools** and **stations** and providing the right infrastructure for the right end user. The PTP has identified various road proposals as well as new cycle links that have been considered as part of the long-term network. The WABN notes specific infrastructure actions to which the Kwinana cycle and walking network plan (the plan) will respond to.

National Strategic Documents

National Cycling Strategy 2011 - 2016

The overarching vision for this strategy is to realise a step-change in attitudes to cycling and in the numbers of riders in this country. In the short term, the goal was to double the number of people cycling during the five-year period.

Priorities and objectives:

- Cycling promotion: promote cycling as both a viable and safe mode of transport and an enjoyable recreational activity.
- Infrastructure and facilities: **create a comprehensive network of safe and attractive routes to cycle, and end-of-trip facilities.**

  All jurisdictions will continue to invest in developing local on-road and off-road cycling networks to key destinations in both urban and rural areas, that are consistent with national standards, and should commit to the identification of required funds in the relevant budget processes. Government will continue to develop end-of trip facilities that make it possible for people to cycle.
- Integrated planning: consider and address cycling needs in all relevant transport and land use planning activities.
- Safety: enable people to cycle safely.
- Monitoring and evaluation: improve monitoring and evaluation of cycling programs and develop a national decision-making process for investment in cycling.
- Guidance and best practice: develop nationally consistent technical guidance for stakeholders to use and share best practice across jurisdictions.

Our Cities, Our Future: A National Urban Policy for a productive, sustainable and liveable future (2011)

The Australian government recognise the importance of people of all ages and abilities to have physical access to employment, education, services and social, recreational and cultural opportunities and facilities. There has been a noticeable shift to cycling as a sustainable, economical and healthy, active transport option.

As such, the report recommends monitoring and reporting on progress toward achieving the national cycling target to double the number of cyclists by 2016. Promote healthy lifestyles through cycling and walking networks, recreation facilities and high-quality public spaces. **Improve accessibility and reduce dependence on private motor vehicles.**

Walking, Riding and Access to Public Transport: Supporting active travel in Australian communities, Ministerial Statement (2013)

The primary objective of this statement is to articulate the Australian Government's interests in broadening the range of transport options in our communities: by increasing the share of people walking and riding for short trips; and improving their ability to access public transport.

Plan: Include walking and riding when planning for land use and transport

- Identify principal walking and riding routes in regional and local plans that are consistent with overall state planning and transport strategies.
- **Design networks of continuous, convenient connections.**
- Enable short walking and riding trips for transport purposes.
- Improve access to and within major activity, employment and education centres, focusing on 20-minute catchments (two kilometres walking, five kilometres cycling).
- Improve access to public transport stops particularly 5–10-minute walking catchments.

Build: Build appropriate infrastructure for walking and cycling needs

- Create safe environments for pedestrians and bicycle riders.
- Incorporate pedestrian and bicycle facilities when building infrastructure.
- protect routes for walking, riding and accessing public transport so that existing connections are not severed.

Encourage: Enable greater participation in walking, riding and public transport

Govern: Coordinate across agencies and levels of government

Walking, Riding and Access to Public Transport – Australian Government Ministerial Statement

The Australian Government Ministerial Statement on Walking, Riding and Access to Public Transport recognises the following benefits of these modes to private car travel:

- increased capacity in the broader transport network;
- reduced congestion;
- reduced environmental impacts;
- improved public health; and
- improved community wellbeing.

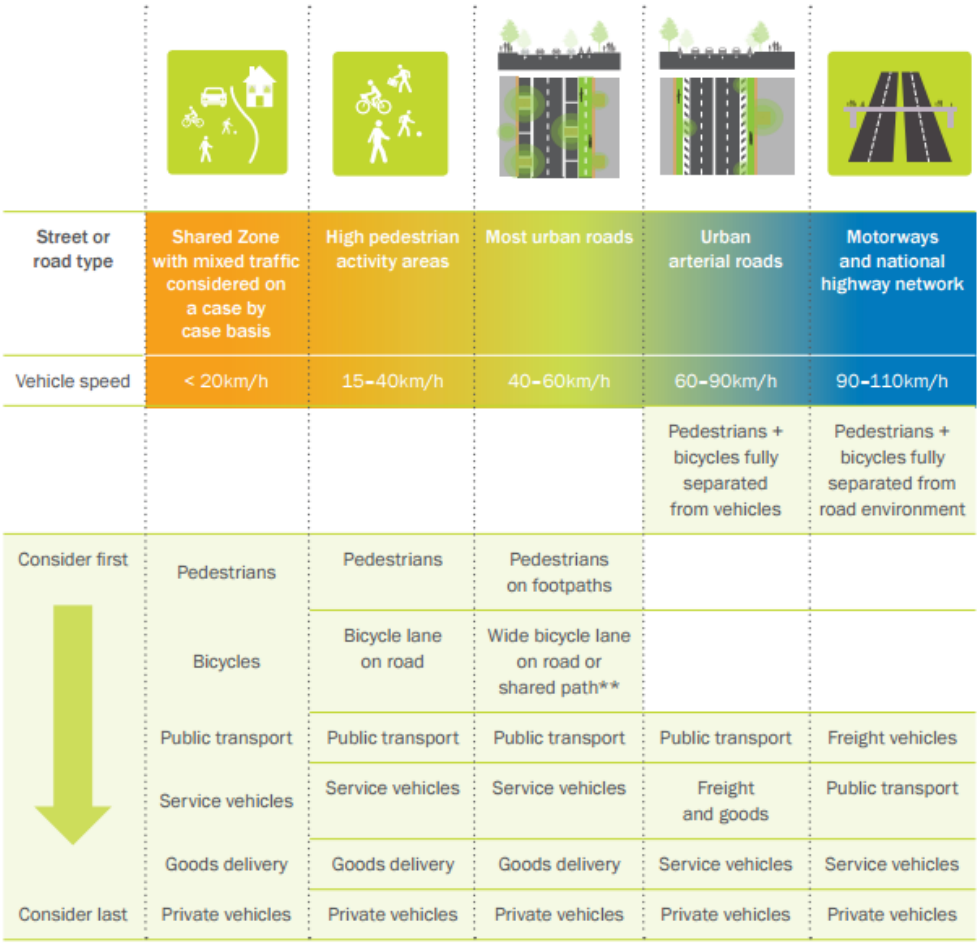
Moreover, the document reports on a study commissioned by the Queensland Government, which concluded that the net benefit to the community of cycling is approximately $1.43 per kilometre cycled. Primarily these benefits are achieved through health benefits ($1.12/km), which were partially offset by injury costs ($-0.37/km).

Significant benefits also came from decongestion ($0.21/km) and vehicle operating costs ($0.35/km). Noise reduction, air quality, greenhouse gases, infrastructure provision and parking cost savings accounted for a total of ($0.13/km).

Key principles in achieving an increase in the number of people walking and cycling for shorter trips and accessing public transport include, integrating planning of walking and cycling in land use planning and building appropriate infrastructure for these modes of transport.

Guidance on how to achieve an integrated road network is provided and reproduced in Figure A.1 which essentially indicates to consider the needs of private motor vehicles last.

Figure A.1: Road Network Hierarchy Integration of Walking, Riding and Access to Public Transport



Source: Walking, Riding and Access to Public Transport, pg. 31

NATIONAL GOVERNMENT SUMMARY

Federally released documents require state and local governments to improve accessibility within their jurisdiction in order to **reduce the dependence on private motor vehicles** and reduce social isolation. The **active transport networks should be continuous, convenient and connected** providing a **safe** environment for pedestrians and cyclists.

Appendix B

Socio-Economic Report

KWINANA CITY CYCLE AND WALKING NETWORK PLAN

SOCIAL AND ECONOMIC REVIEW

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Kwinana City Cycle and Walking Network Plan – Social and Economic Review

July, 2017

NO.	DATE.	DETAILS	APPROVED BY
1.	28/04/2017	First Draft	SOS
2.	21/07/2017	Final Report	SOS

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Contents

List of Figures

List of Tables

1.0

INTRODUCTION

INTRODUCTION

1.0. Introduction

1.1. PROJECT METHODOLOGY

The assessment of current factors relating to emerging health and social issues and attitudes towards the liveability of Kwinana has involved a process of identifying key issues arising, challenges, opportunities and strategies to improve the quality of life and support a modal shift for delivery of an Active Transport Plan.

The short timeframe for the project dictated a mixed data collection approach. Quantitative research was undertaken in the form of a literature review and development of a Quality of Life (QoL) Index Framework to enable further review and validation of information and performance measures. This was followed by the qualitative review to confirm quantitative data analysis and assist in the identification of key impacts, future priorities, strategies and responsibilities to enable a full assessment of health and social issues and attitudes arising within the City of Kwinana, and how this can be improved upon in the future (Figure 1). Secondary data for addressing both qualitative and quantitative information was sourced from publically available reports and strategies, statistics from the Australian Bureau of Statistics and Australian Health Atlas as well as various academic publications.

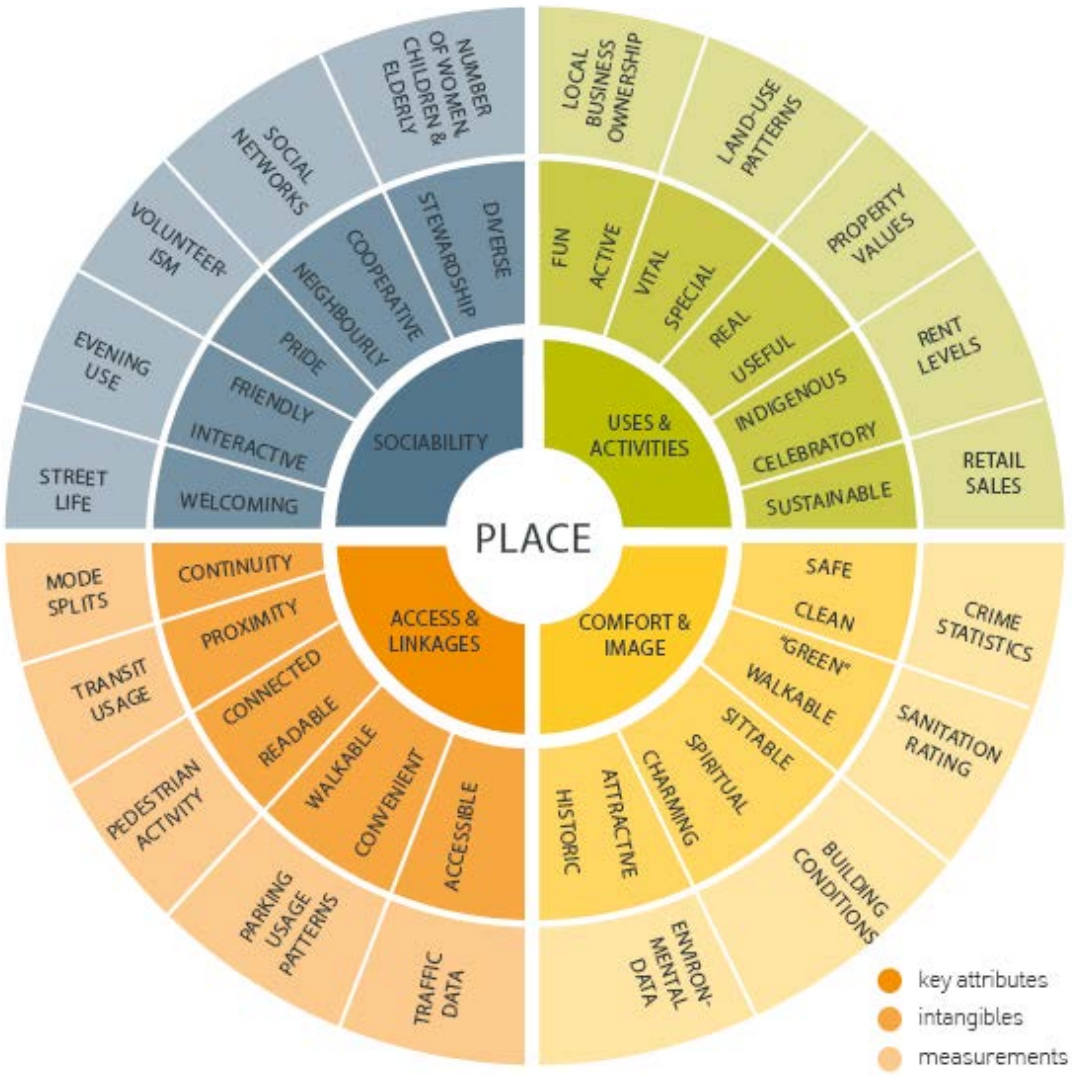
Figure 1. Qualitative and Quantitative Research

Measuring liveability: The Place Lens

Measuring liveability can be very challenging as people look for and value different things when searching for 'a place to call home'. Liveability is closely linked to place. It is therefore valuable to reference a place lens that considers both the intangible qualities of place and the measurable quantitative aspects to enable a more comprehensive assessment of the success of a place as a liveable community (Figure 2).

Capturing data for both the quantitative and qualitative aspects of liveability and place provides the opportunity to measure the success of Kwinana as a place to live. This in turn will provide justification for future funding and service provision supporting the delivery of an Active Transportation Plan.

Figure 2. Place Lens



2.0

QOL INDICATOR FRAMEWORK

QUALITY OF LIFE INDICATOR FRAMEWORK

2.0. Quality of Life (QoL) Indicators Framework

2.1 DOCUMENT REVIEW

There are a number of strategies and studies that are relevant to the Kwinana Social and Economic Review. Documents reviewed include strategic initiatives adopted at the state, regional and local level. Also included are academic research and current studies, all of which are identified to be relevant to the central themes contained within the QoL Framework. Undertaking this review ensures that qualitative data is captured from a variety of sources strengthening the information collated and further enables the alignment of strategic objectives across all tiers of government.

The document review has taken into account the following key documents. A summary of their relevance and key issues and opportunities arising are included in **Appendix C**. The review provided the basis to identify some of the key gaps in current strategies and related policies to inform key QoL theme areas for further review.

City of Kwinana **Planning Strategies:**

- City of Kwinana Healthy Lifestyle Plan (City of Kwinana, 2014)
- City of Kwinana Strategic Community Plan (City of Kwinana, 2013)
- City of Kwinana Health and Wellbeing Profile (SMPHU, 2013)
- Healthy Active By Design (Heart Foundation, 2017)
- Western Australian Helath Promotion Strategi Framework 2012-2016 (DOH, 2012)
- Activating Architecture and Urban Planning (RA, 2009)

2.2 DETERMINING A QUALITY OF LIFE (QOL) INDICATORS FRAMEWORK

Quality of life (QOL) indicators are a basis for measuring a community's 'vital signs' (Carver County, 2006:i). Individually, indicators will explain and track progress in relation to a particular issue or feature while collectively, QOL indicators are a basis for viewing the larger picture and helping to continuously guide key institutions including policy makers in choosing appropriate responses.

QOL indicators have many different interpretations and will mean different things to different stakeholders. The challenge is to identify a meaningful set of indicators which can be measured and which provide useful information on variables which are directly related to the sphere of influence of key decision making bodies. The measurement of QOL indicators helps to guide processes of prioritising issues and allocating resources and also to engage broader constituencies including local communities. Ongoing measurement that is transparent and informative will help build trust and confidence among key stakeholders and is a foundation for partnerships in addressing even the most entrenched issues.

QOL indicators provide a structured way to collect, organize and analyses information about a particular place. Indicators are generally measured over time involving ongoing methods of data collection and reporting to key stakeholders such as local leaders, decision makers, residents and representatives from key institutions. The Australian Centre for Quality on Life based at Deakin University has developed the following definition:

> "*Quality of life is both objective and subjective. Each of these two axes comprises several domains which, together, define the total construct. Objective domains are measured through culturally relevant indices of objective well-being. Subjective domains are measured through questions of satisfaction.*"

(Australian Centre on Quality of Life, 2010)

There is a challenge in choosing appropriate indicators. The following framework by Hollander suggests criteria for making decisions about appropriate indicators and has been taken into consideration in the preparation of the QoLI indicator framework for Kwinana:

Table 1. Criteria for choosing indicators

Criteria	Description
Validity	Well-grounded in sound data and accurately depicts a real situation.
Relevance	Appropriate for and pertinent to the community's important issues.
Consistency and reliability	Data can be researched reliably over a period of time.
Measurability	Data can be obtained for the community.
Clarity	Indicators are not ambiguous and can be understood by a diverse group of people.
Comprehensiveness	Represents many parts of an issue and reduces the need for excessive number of indicators.
Cost effectiveness	Data collection is not overly expensive.
Comparability	Sufficiently general that communities can be compared to one another.
Attractiveness	Inspires interest by key stakeholders such as community groups, key institutions and the media.

Hollander 2002:3, in Phillips, 2003:18

This review considers the current projects being undertaken as part of the Kwinana Cycle and Walking Network Plan, which has assisted in determining targeted QOL indicators as they relate to liveability. From this review, a suggested list of indicators were proposed taking into account broadly:

- The scope of City of Kwinana (CK) role in the wider community;
- The capacity to meaningfully measure the indicators over time;
- The extent that these indicators are in direct relationship with some of the current key issues in the region and will therefore help to track progress of interventions intended to address these issues over time; and
- The need for broader partnerships and community capacity in addressing the issues raised by measuring indicators and therefore the need for strategic decisions that engage stakeholders in analysis and implementation.

The QOL indicators framework (Table 2) has been modelled on Community Indicators Victoria (CIV). CIV is comprehensive, driven from the level of the State Government and involves significant institutional partners enabling a comprehensive set of indicators and coverage of wide geographic areas (Victorian Community Indicators Project, 2006). It is a well-developed Australian example that encompasses both urban and rural areas. CIV has generated significant resources to assist with measuring indicators relevant to this project.

The following is the proposed QOL Indicators framework for measuring liveability in Kwinana

Table 2. Framework for Quality of Life Indicators for Kwinana

Theme	Domain	Indicators
Health Check	**Early Childhood**	Australian Early Development Index
	Mental health	Psychological distress
	Physical health	Quality of Life
		Obesity
		Prevalence of Type 2 Diabetes
		Adult Health Risk
		Adequate physical exercise
Sense of Place	**Personal & Community Safety**	Perceptions of Safety
		Incidence of Crime (person/property)
	Citizen Engagement	Opportunity to Have a Say on Important Issues
		Perceptions of Involvement in Local Issues & Community Activities
	Community Connectedness	Perceptions of Feeling Part of the Community
		Volunteering rates
		Youth Earning and Learning
Public Open Space	**Quality of spaces**	Appearance of public space playgrounds, parks and reserves
		Quality of Streetscapes
Movement Networks	**Connectivity between destinations**	Public transport patronage
		Dedicated walking and cycling trails
		Road safety
		Transport limitations
	Safety	Perceptions of traffic safety
Community Facilities & Key Destinations	**Services Availability**	Perceptions of Access to Services and Facilities
		Access to Services (shops, cafes, restaurants etc)
		Opportunities to Participate in Sporting and Recreation Activities
		Major Services Presence
	Access to key uses	Distance to Primary Education Services
		Distance to Secondary Education Services
		Journeys to Work
		Employment rate
Housing Diversity	**Housing choice**	Housing affordability
		Dwelling structure
		Household structure

The indicator framework has been devised as a tool for measuring progress towards a common goal (in this case aimed at achieving a liveable city and active community) and to provide sound information or evidence upon which to base decisions and actions. It was also envisaged that the indicators would include a mix of objective and subjective measures, given the importance of identifying differences between perception and reality, and the need for the framework to include priority values and goals of the Kwinana community, irrespective of their ease of measurement. In the case of Kwinana, the indicators are shaped in response to the identified needs.

The challenge with wellbeing indicator suites is that all possible measures cannot be included because the suite becomes too large and unwieldy, hard to decipher and potentially unnavigable to the community in general (ibid). As part of the filtering process for this review, in an effort to reduce the number of potential indicators, it was far easier to add indicators than to subtract them. At the same time, essential health and wellbeing indicators for which no immediate concerns were expressed by the wider community were deleted. It is important to note, rather than being an end in themselves, the indicators can only act as a spotlight and as a means to inform and focus whole community action.

2.3 LIMITATIONS AND CONSIDERATIONS

Indicator Data Sets

Having identified the suite of indicators, the next task was to identify available data by which to undertake ongoing indicator measurements. One of the important limitations identified is the relative lack of local area data and that data sets are more readily available at the state or sometimes at the regional level.

A clear priority, if the indicators are to be useful for local government planning, is that some data will need to be collected via surveys or accessed from data collected administratively, usually by government departments. As discussed in Section 6, the implementation of a Kwinana Social and Economic Review is an early priority.

2.4 CONCLUSION

This section has outlined the themes, domains and indicators that make up the Kwinana QoL Indicators Framework. Within Section 4.0 further discussion is provided on each of the indicators data sources, the current status of progress measures (indicators) and historical trends, as well as an outlining “what the community has said” in response to these measures in order to identify key impacts and priorities.

3.0

CITY OF KWINANA SNAPSHOT

CITY OF KWIANA SNAPSHOT

3.0. City of Kwinana Snapshot

The following section provides an overview of the City of Kwinana's demographic profile identifying key statistics and trends that will have an impact on current and future social and economic needs of the community. The demographic analysis uses both 2011 and 2016 Australian Bureau of Statistics (ABS) census data, sourced from the City's demographers .id community.

3.1. LOCATIONAL CONTEXT

The City of Kwinana is located in Perth's outer southern suburbs, between 25 and 37 kilometres south of the Perth and covers an area of 120 square kilometres as shown in Figure 3. The area is made up of residential, industrial, rural and rural residential areas as well as a major retail and commercial city centre. A total of nine sub-catchment (small) areas is identified within the City of Kwinana LGA.

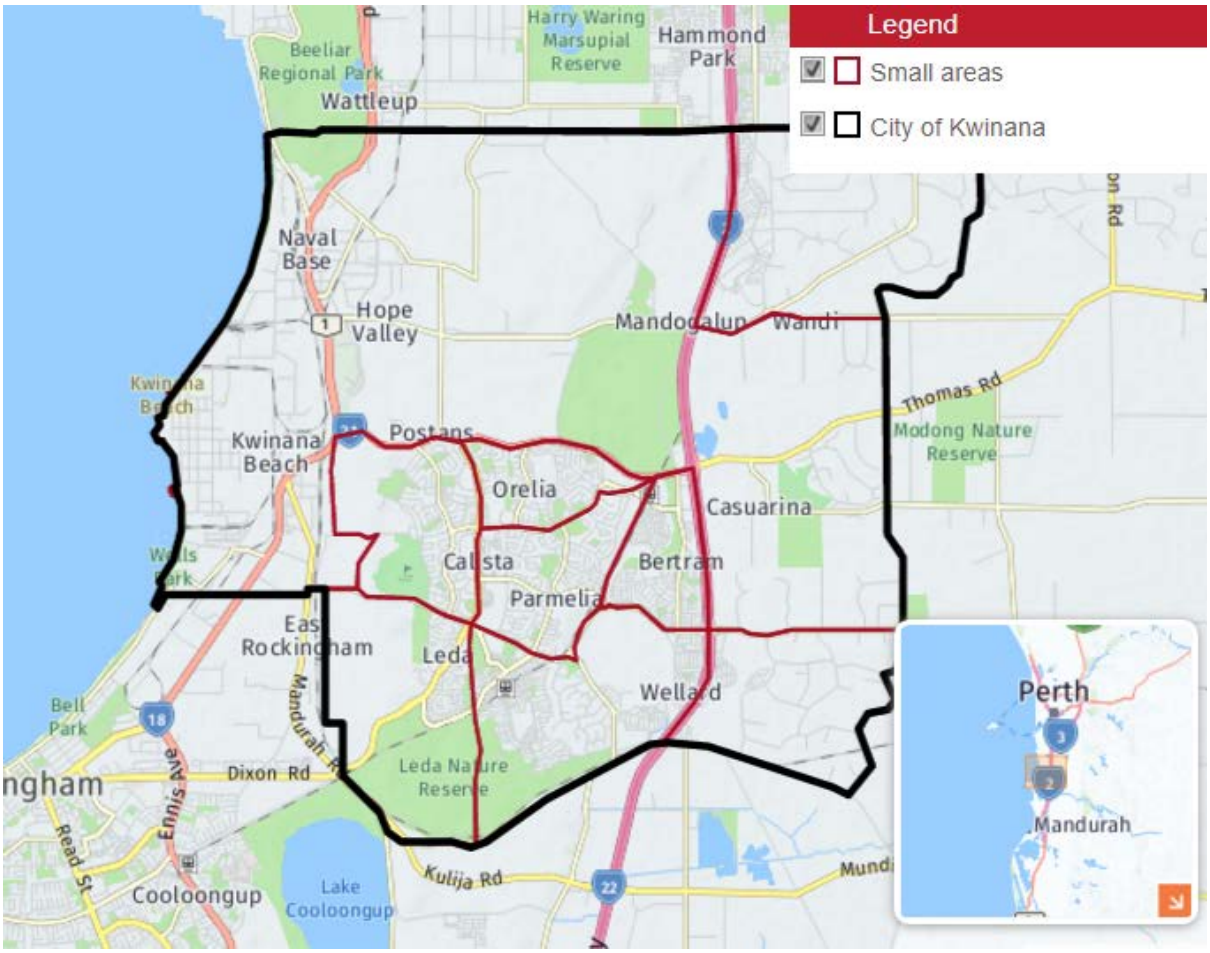


Figure 3. City of Kwinana context map

Source: Population and household forecasts, 2011 to 2036, prepared by .id, the population experts, May 2015.

3.2. POPULATION TRENDS

The following population and household forecasts for City of Kwinana present what is driving population change in the community and how the population, age structure and household types will change each year between 2016 and 2036.

Current Population

At 2016 Census the City of Kwinana had a resident population of 38,918 people, comprised of 51.3% male and 48.7% female residents (ABS Census, 2016). Between 2011 – 2016 the City experienced a 24% population growth, with the majority of this growth occurring in the urban areas of Bertram and Wellard (west). The predominant age ranges for people living within the city are between 30 to 34 years of age and between 25 to 29 years old. Population and resident age profiles have been shown in Figure 4.

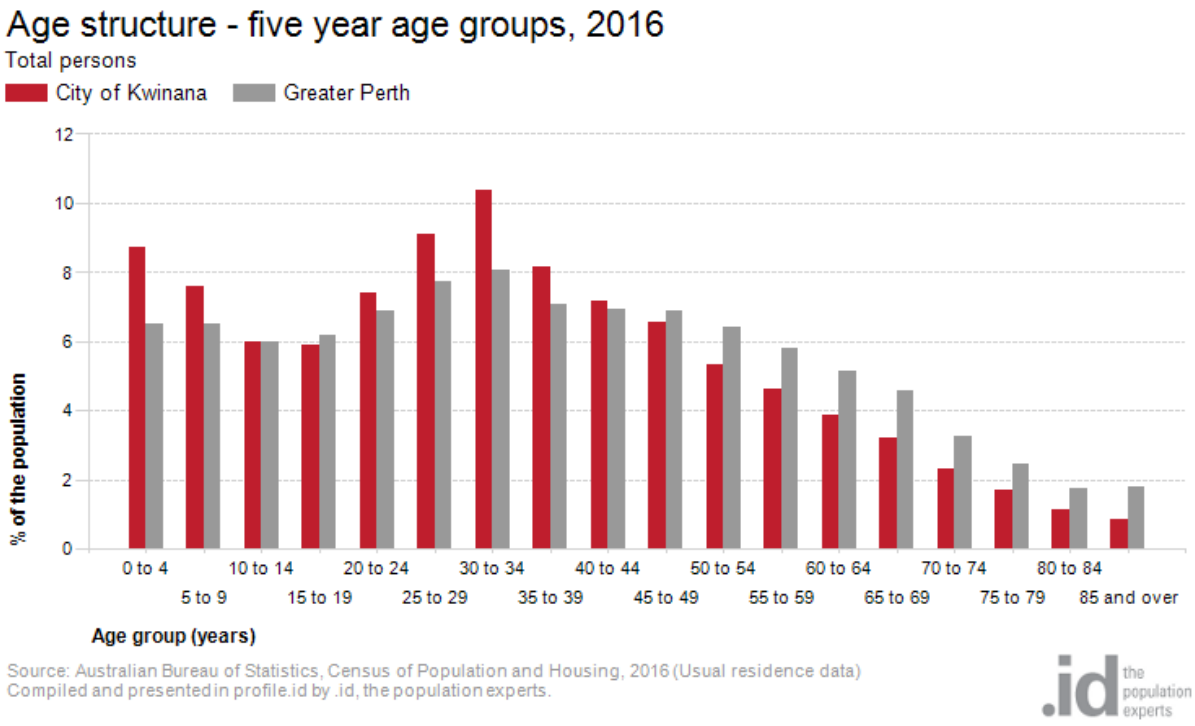


Figure 4. Estimated Resident Population and % Change, 2016

Source: Australian Bureau of Statistics, Regional Population Growth, Australia (3218.0). Compiled and presented by .id the population experts

Future Population

Figure 5 summarises the population for the City of Kwinana and each of its small areas. This highlights how population change is affecting different parts of the Kwinana LGA in different ways. As seen from 2016 census data, the population within the area of Bertram, bound by the Kwinana Freeway (east) and Kwinana Railway Station (west), has exceeded growth projections, while the older, more established areas of Orelia and Parmelia - Kwinana Town Centre have remained relatively constant.

City of Kwinana	Forecast year						Change between 2011 and 2036	
Area	2011	2016	2021	2026	2031	2036	Total change	Avg. annual % change
City of Kwinana	30,697	39,941	51,563	62,695	73,679	84,207	+53,510	+4.12
Anketell - Casuarina	1,780	1,779	2,571	5,346	9,812	13,963	+12,183	+8.59
Bertram	5,352	6,089	6,771	6,851	6,742	6,672	+1,320	+0.89
Calista - Medina - Employment Area	4,347	4,680	4,882	5,043	5,139	5,207	+860	+0.72
Leda	3,509	3,450	3,479	3,400	3,356	3,336	-173	-0.20
Orelia	4,901	5,099	5,934	6,455	6,672	6,644	+1,743	+1.22
Parmelia - Kwinana Town Centre	6,468	6,851	8,685	10,746	12,310	12,330	+5,862	+2.61
Wandi - Mandogalup	924	2,882	4,722	7,196	9,564	15,528	+14,604	+11.95
Wellard (East)	714	2,978	4,593	6,011	7,366	7,524	+6,809	+9.88
Wellard (West)	2,701	6,133	9,927	11,647	12,719	13,003	+10,302	+6.49

Figure 5. Population forecast for Kwinana LGA local areas, 2011 to 2036

Source: Population and household forecasts, 2011 to 2036, prepared by .id , the population experts, May 2015.

Key Findings

- In 2016, the total population of the City of Kwinana was 38,918 people.
- It is expected to increase by over 31,900 people to 62,695 by 2026, at an average annual growth rate of 4.88%.
- This is based on an increase of over 10,900 households during the period, with the average number of persons per household rising from 2.69 to 2.79 by 2026.

3.3. POPULATION AGE TRENDS

The Age Structure of the City of Kwinana provides key insights into the level of demand for age based services and facilities such as child care. It is also an indicator of the City of Kwinana's residential role and function and how it is likely to change in the future. Five year age groups present a classic age profile of the population.

Between 2006 and 2016 the median age of Kwinana LGA remained relatively stable at 32 years of age (ABS Census, 2016). The median age of Kwinana LGA in 2016 is much lower when compared to Western Australia which had a median age of 36. Figure 7 below shows the change in age groups for the Kwinana LGA between 2006 and 2011. Notable historic trends over the two census periods showed most significant growth (as a proportion of overall population) was in the age group '25 to 34 years', which increased by 9.2%, this was followed by '0 to 4 years' and '30 to 34 years', which experienced an 8.9% and 8.5% increase respectively.

City of Kwinana - Total persons (Usual residence)	2011			2006			Change
Five year age groups (years)	Number	%	Greater Perth %	Number	%	Greater Perth %	2006 to 2011
0 to 4	2,593	8.9	6.6	1,754	7.6	6.1	+839
5 to 9	2,171	7.4	6.2	1,801	7.8	6.4	+370
10 to 14	1,940	6.6	6.4	1,828	7.9	6.9	+112
15 to 19	1,978	6.8	6.8	1,470	6.3	7.3	+508
20 to 24	2,142	7.3	7.5	1,724	7.4	7.3	+418
25 to 29	2,699	9.2	7.7	1,763	7.6	6.5	+936
30 to 34	2,470	8.5	7.0	1,881	8.1	7.0	+589
35 to 39	2,205	7.5	7.2	1,911	8.2	7.5	+294
40 to 44	2,214	7.6	7.4	1,660	7.2	7.5	+554
45 to 49	1,854	6.3	7.1	1,486	6.4	7.4	+368
50 to 54	1,601	5.5	6.5	1,335	5.8	6.8	+266
55 to 59	1,398	4.8	5.8	1,211	5.2	6.3	+187
60 to 64	1,223	4.2	5.3	1,012	4.4	4.6	+211
65 to 69	914	3.1	3.8	784	3.4	3.6	+130
70 to 74	729	2.5	3.0	646	2.8	2.9	+83
75 to 79	518	1.8	2.3	454	2.0	2.5	+64
80 to 84	318	1.1	1.8	272	1.2	1.8	+46
85 and over	260	0.9	1.6	203	0.9	1.5	+57
Total population	29,227	100.0	100.0	23,195	100.0	100.0	+6,032

Figure 6. Age Change Kwinana LGA local areas, 2006 to 2011

Source: Population and household forecasts, 2011 to 2036, prepared by .id , the population experts, May 2015.

Profiling how the age structure of the population is changing will be essential for planning appropriate age-based facilities and services, such as child care, recreation and aged care. The forecast age groups of the City of Kwinana is a function of the current age of the population as well as the age of people migrating into and out of the area. This in turn is driven by location (fringe, city centre, regional or rural) the existing housing stock (separate dwellings, medium or high density), the amount and type of new residential development (same as existing stock, or diversifying) and where the area is in a cycle of change.

Figure 7 shows the projected change in age groups for the Kwianan LGA between 2011 and 2036. Notable trends include:

- Expected twofold increase in the older age groups of '40 to 74 year olds';
- Expected increase in the ages groups '0 to 4 year olds', '20 to 24 year olds', '25 to 29 year olds' and '30 to 39 year olds';
- In 2016, the largest age group across the city was '30 to 34 year olds'. This trend is not expected to continue with '0 to 4 year olds' becoming the biggest age group by 2036.

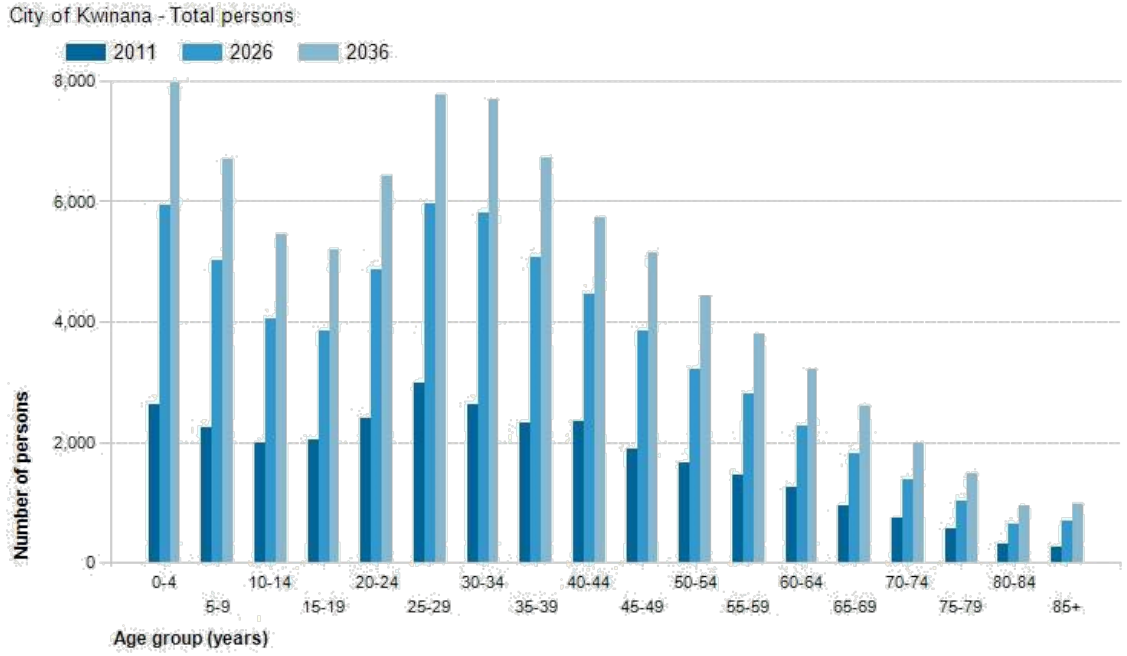


Figure 7. Forecast Change in Age Groups Kwinana LGA (5 year age group), 2011 and 2036

Source: Population and household forecasts, 2011 to 2036, prepared by .id the population experts, May 2015.

Key Findings

- In 2016, the dominant age structure for persons in the City of Kwinana was ages 30 to 24.
- The City of Kwinana has a larger percentage of 'Young Workforce' (19.5% compared to 15.8%)
- The largest increase in persons between 2011 and 2026 is forecast to be in ages 0 to 4, which is expected to increase by 3,304 and account for 9.5% of the total persons.
- The largest 5 year age group in 2026 is projected to be 25 to 29 years, with a total of 5,950 persons.

3.4. FAMILY STRUCTURE

Figure 8, summary of the household/family types in the City of Kwinana in 2016 compared to Greater Perth shows that there was a similar proportion of couple families with child(ren) and slightly lower proportion of one-parent families. Overall, 33.5% of total families were couple families with child(ren), and 12.8% were one-parent families, compared with 32.3% and 9.8% respectively for Greater Perth.

City of Kwinana - Total households (Enumerated)	NEW 2016			2011			Change
Households by type	Number	%	Greater Perth %	Number	%	Greater Perth %	2011 to 2016
a Couples with children	4,622	33.5	32.3	3,370	31.7	31.6	+1,252
a Couples without children	3,195	23.1	25.4	2,527	23.7	25.7	+668
a One parent families	1,775	12.8	9.8	1,411	13.3	9.9	+364
Other families	176	1.3	1.3	129	1.2	1.4	+47
a Group household	416	3.0	3.8	340	3.2	4.0	+76
a Lone person	2,703	19.6	21.7	2,207	20.7	22.4	+496
Other not classifiable household	847	6.1	4.8	601	5.6	3.9	+246
Visitor only households	81	0.6	1.0	61	0.6	1.1	+20
Total households	13,815	100.0	100.0	10,646	100.0	100.0	+3,169

Figure 8. Household type, 2011 to 2016

Source: Australian Bureau of Statistics, Census of Population and Housing, 2016 (Usual residence data) Compiled and presented in profile.id by .id, the population experts.

Analysing the future household structure in City of Kwinana, especially in conjunction with age structure, provides insight to the role the area plays in the housing market. Usually areas such as Bertram with separate housing stock are dominated by families. Others, with more dense housing in inner city locations such as Parmelia have significant numbers of lone person households and couples without dependents.

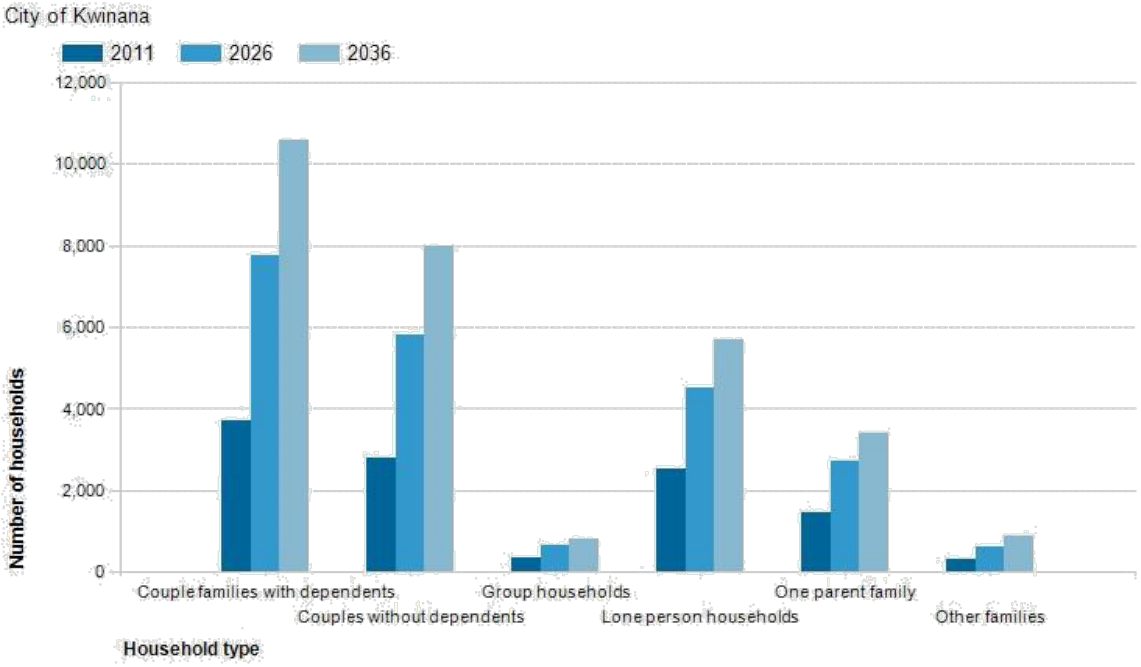


Figure 9. Forecast Household Types Kwinana LGA, 2011 and 2036

Source: Population and household forecasts, 2011 to 2036, prepared by .id the population experts, May 2015.

Key Findings

- In 2016, the dominant household type in the City of Kwinana was Couple families with dependents, which accounted for 32% of all households.
- The largest increase between 2011 and 2026 is forecast to be in Couple families with dependents, which will increase by 4,061 households and account for 35.1% of all households (Figure 9).
- In contrast Group households is forecast to increase by 321 households, to comprise 3.0% of all households in 2026, compared to 3.1% in 2011.

3.5. DWELLING AND DEVELOPMENT TRENDS

Current Dwelling Types

Dwelling Type is an important determinant of the City of Kwinana's residential role and function. A greater concentration of higher density dwellings is likely to attract more young adults and smaller households, often renting. Larger, detached or separate dwellings are more likely to attract families and prospective families. The residential built form often reflects market opportunities or planning policy, such as building denser forms of housing around public transport nodes or employment centres.

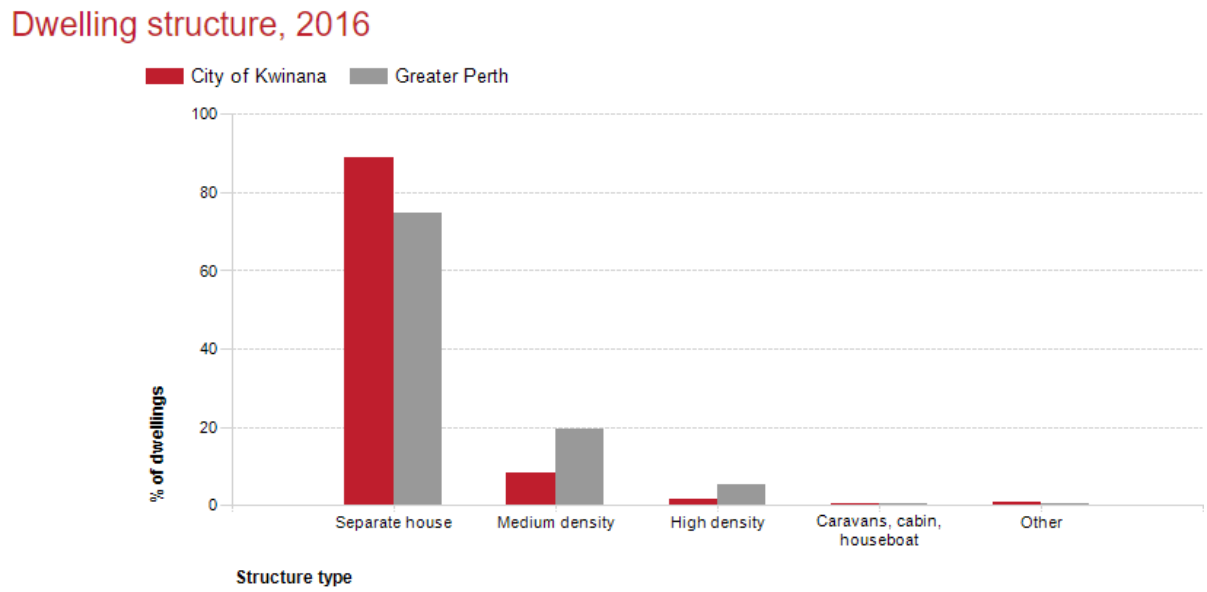


Figure 10. Dwelling Structure, 2016

Source: Australian Bureau of Statistics, Census of Population and Housing, 2016 (Enumerated data) Compiled and presented in profile.id by .id, the population experts

Analysis of the types of dwellings in the City of Kwinana in 2016 shows that 88.9% of all dwellings were separate houses (Figure 10), 8.4% were medium density dwellings, and 1.5% were in high density dwellings, compared with 74.6%, 19.6%, and 5.1% in the Greater Perth respectively (ABS Census, 2016).

Housing Role and Function

The primary housing market role that the City of Kwinana has played during the past 50 years was to provide housing opportunities for employees of local industry. In the last 10 to 15 years, the City has experienced a decline in the numbers of local jobs, combined with a significant increase in population. This has resulted from increased demand for housing in metropolitan Perth as well as improvements in transport infrastructure such as the Kwinana Freeway.

The variety of periods of settlement in the City mean that various suburbs are at quite different periods in the suburb lifecycle. In the older areas such as Medina and Calista, the original settlers have passed on, resulting in a diversity of age groups. Orelia has experienced new residential development in the last ten years resulting in a regeneration of the area. Significant levels of new residential development are expected over the forecast period in areas along the railway to Mandurah. This includes Bertram, Wellard, Leda, Casuarina and Wandi.

As described above, different areas within the City of Kwinana have slightly different functions based on both era of development and amount of new housing opportunities. Calista-Medina is expected to attract some younger families, while losing some young adults leaving home. Leda and Orelia are expected to continue to attract families in their development phase. New development areas such as Wellard and Wandi are expected to attract large number of young families with children. Parmelia-Kwinana Town Centre by contrast is expected to attract young adults in their teens and twenties in similar fashion to an inner city area. The variety of function and role of the small areas in the City of Kwinana means that population outcomes differ significantly across the LGA.

3.6. EMPLOYMENT PROFILE

Employment Status

The City of Kwinana's employment statistics are an important indicator of socio-economic status. The levels of full or part-time employment, unemployment and labour force participation indicate the strength of the local economy and social characteristics of the population. Employment status is linked to a number of factors including Age Structure, which influences the number of people in the workforce; the economic base and employment opportunities available in the area and; the education and skill base of the population (Occupations, Industries, Qualifications).

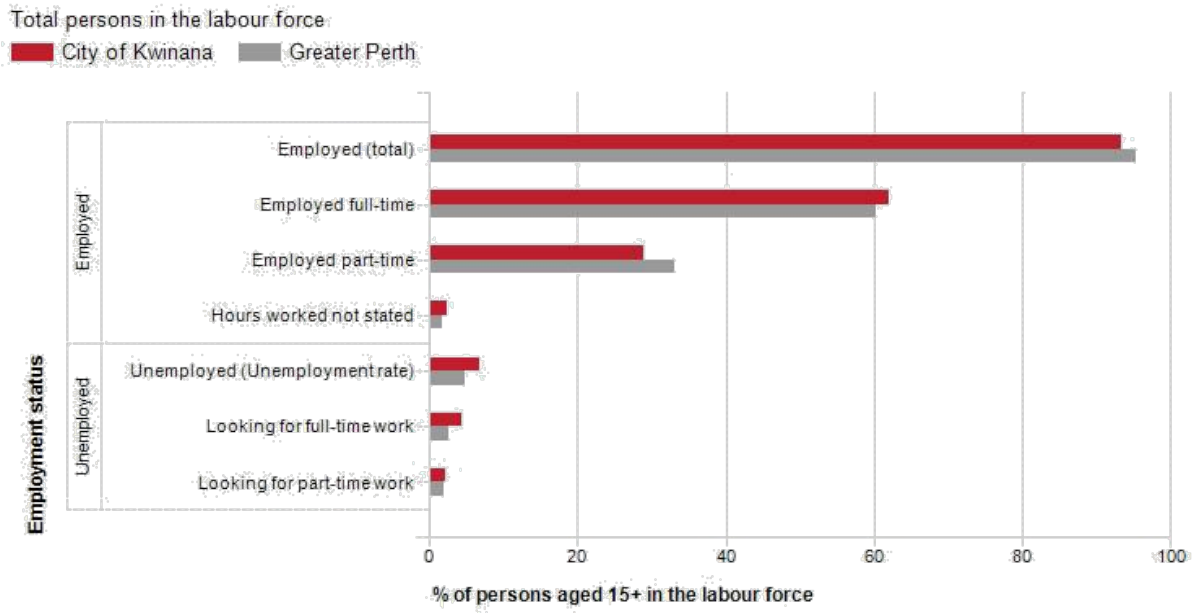


Figure 11. Employment Status, 2011

Source: Australian Bureau of Statistics, Census of Population and Housing, 2011 (Usual residence data) Compiled and presented in profile.id by .id, the population experts.

The size of the City of Kwinana's labour force in 2011 was 13,652, of which 3,962 were employed part-time and 8,450 were full time workers (ABS Census, 2011). Analysis of the employment status (as a percentage of the labour force) in the City of Kwinana in 2011 compared to Greater Perth shows that there was a lower proportion in employment (Figure 11), and a higher proportion unemployed. Overall, 93.3% of the labour force was employed (56.5% of the population aged 15+), and 6.7% unemployed (4.1% of the population aged 15+), compared with 95.2% and 4.8% respectively for Greater Perth.

The labour force participation rate refers to the proportion of the population aged 15 years and over that was employed or actively looking for work. "*The labour force is a fundamental input to domestic production. Its size and composition are therefore crucial factors in economic growth. From the viewpoint of social development, earnings from paid work are a major influence on levels of economic well-being.*" (Australian Social Trends 1995).

Workers' Place of Residents

Journey to Work data sheds light on how many workers live locally, how many commute from other areas and which areas they commute from. Some areas attract a large external workforce because they have major employment centres or because local residents have a different set of skills or aspirations than the local jobs require. Understanding where workers reside assists in planning and advocacy for roads and public transport provision. It also helps to clarify economic and employment

drivers across areas and assists in understanding the degree to which the City of Kwinana provides local employment. As illustrated in Figure 12, approximately three quarters of people work in the area but live outside the City of Kwinana.

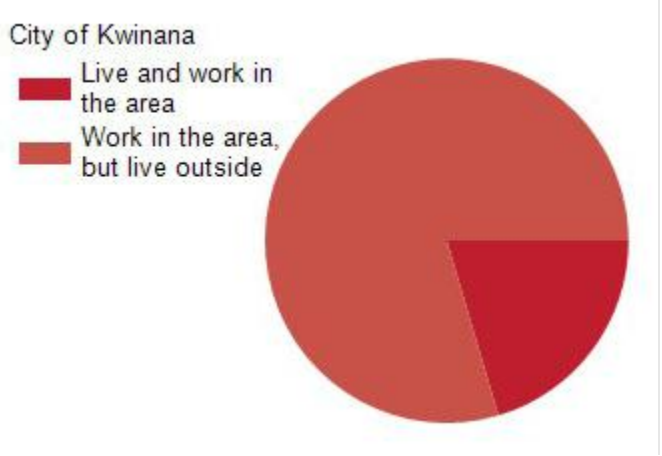


Figure 12. Residential location of Residential Workers, 2011

Source: Australian Bureau of Statistics, Census of Population and Housing, 2011 (Usual residence data) Compiled and presented in profile.id by .id, the population experts.

3.7. METHOD OF TRAVEL TO WORK

The City of Kwinana's commuting statistics reveal the main modes of transport by which residents get to work. There are a number of reasons why people use different modes of transport to get to work including the availability of affordable and effective public transport options, the number of motor vehicles available within a household, and the distance travelled to work.

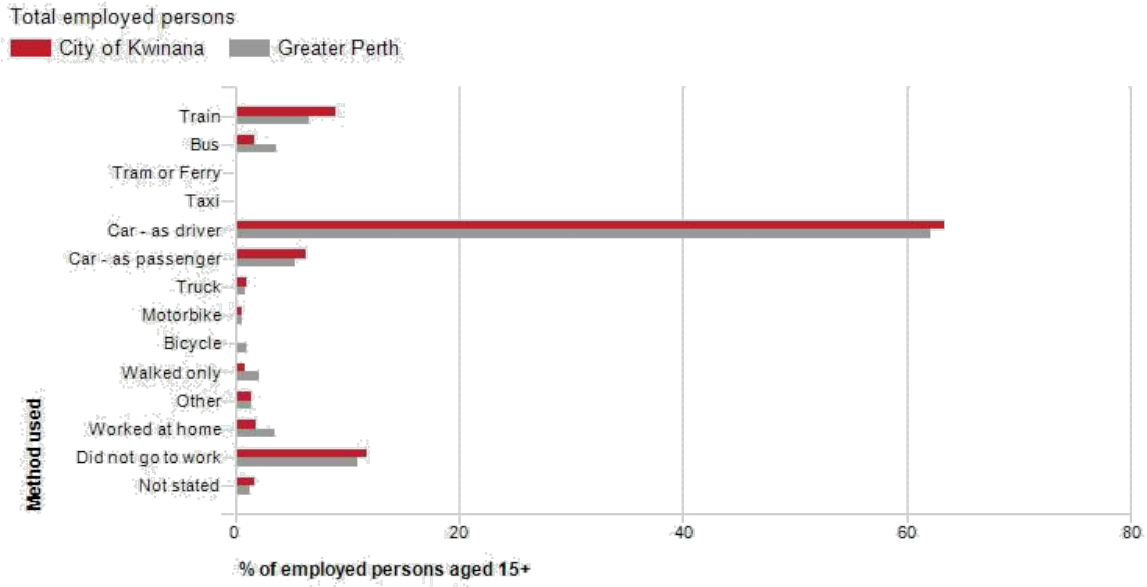


Figure 13. Method of Travel to Work, Kwinana LGA, 2011

Source Australian Bureau of Statistics, Census of Population and Housing, 2011 (Enumerated data) Compiled and presented in profile.id by .id, the population experts.

Figure 13 analysis of the method of travel to work for residents living in the City of Kwinana in 2011, compared to Greater Perth, shows that 10.7% used public transport, while 71.4% used a private vehicle, compared with 10.4% and 68.9% respectively in Greater Perth (ABS Census, 2011).

3.8. INDIVIDUAL INCOME

The City of Kwinana's income statistics are an indicator of socio-economic status. With other data sources, such as Household Income, Qualifications and Occupation, they help tell the story of the area's economic opportunities and socio-economic status. Individual income levels are not comparable over time because of the influences of economic change such as wage level fluctuations and inflation. The income quartile for the City of Kwinana in Figure 14 illustrates a greater portion in the medium highest quarterly (Profile.id 2011).

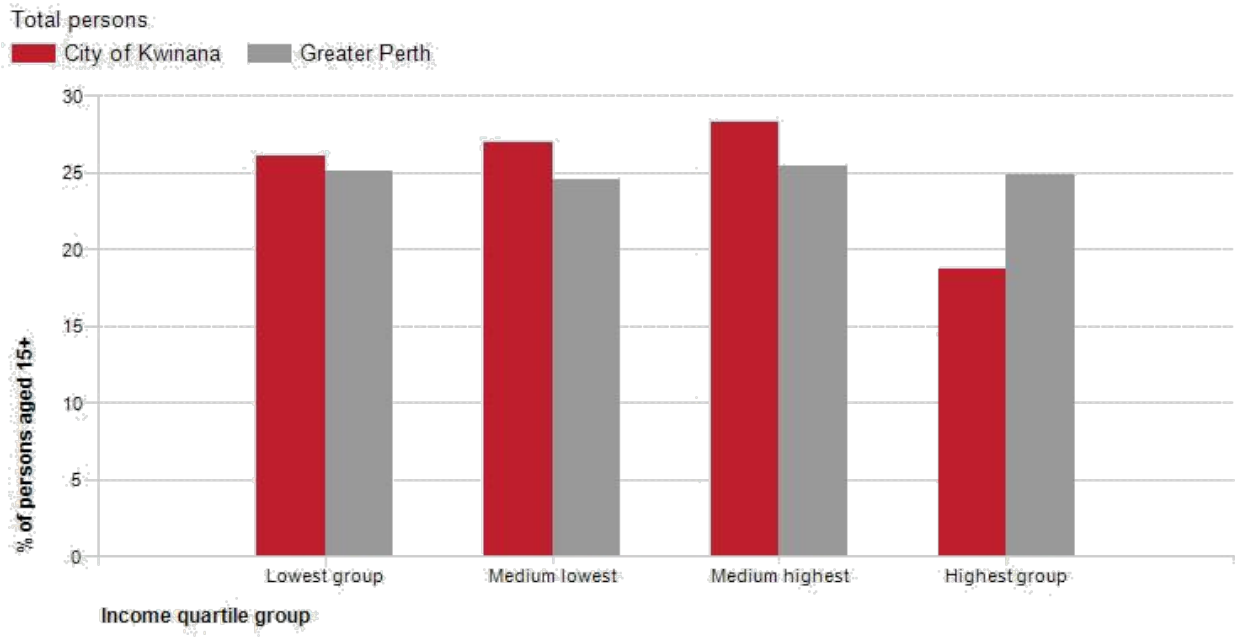


Figure 14. Individual Income Quarterlies, 2011

Source: Australian Bureau of Statistics, Census of Population and Housing, 2011 (Usual residence data) Compiled and presented in profile.id by .id, the population experts

3.9. IMPLICATIONS FOR LIVEABILITY & SOCIAL SERVICES

The socio-economic review for Kwinana LGA has highlighted a number of implications for this study:

Population is expected to be younger over time

The population of Kwinana is getting younger and it is expected that this trend will continue to 2036. The young population presents opportunities and challenges in relation to liveability and social services including:

- Stress on current community facilities, youth services, and other related social services. The increased level of service and provision of a holistic range of facilities required by a younger population.
- Programs and services will be needed for older people, especially those that address social isolation.
- Older people are becoming increasingly healthier, active, and productive. Retirement presents opportunities to engage in recreational and leisure pursuits and volunteering. This has implications for planning of community, cultural, and sport and recreation facilities as demand and usage of these facilities.
- As noted in the City of Kwinana Strategic Community Plan, there has been an increased requirement for aged care services and facilities in recent times.

High proportion of families with young children

Consistent with historic trends, families with children are the predominant household type in Kwinana representing 48.5% of all family types. Consequently, there will be requirements for appropriate children's and family services in the region. Venues such as community or neighbourhood centres create a valuable resource offering a range of activities including parenting classes, playgroups and childcare.

High proportion of separate households

Separate housing makes up 90% of dwelling types in Kwinana. This reflects the need for increased housing diversity and urban consolidation, as required by Directions 2031 and Beyond.

High rate of private vehicle use

Journey's to work highlighted 71.4% of people in the City of Kwinana drive solo, while only 10.7% catch public transport. This reflects opportunities to densify housing development (population densities) around key centres in order to create viable public transport services.

Local Economy

Planning needs to be proactive and holistic, understanding supply chains, to enable economic development to occur. Eliminate unnecessary red tape from the planning process.

- Continue to strengthen the existing strong relationships with industry and foster new relationships with local businesses.
- Provide increased diversity of employment such as retail and mixed business to cater for a wider employment market.

4.0
QUALITY OF LIFE INDICATORS

QUALITY OF LIFE INDICATORS

4.0. Review of Quality of Life Indicators

Within the focus of the Kwinana Local Government Area, the following review of Quality of Life Indicators aims to assess the measures of progress for achieving a liveable city and greater community wellbeing. This section outlines the current status and historic trend validated by what the community have said in order to identify potential impacts, challenges and opportunities to inform future strategies and areas of priority.

The indicators act as a spotlight to inform future strategies for ensuring the city is a place that offers an appropriate level of diversity of activities and experiences, a place that provides for people of all ages and backgrounds, and reinforces the unique qualities of the place to be embraced and celebrated.

STRATEGIES:

Strategies are seen as critical first steps to be undertaken in order for additional steps to be addressed. Where these have been indicated in **bold,** these are identified as high priority areas to be addressed.

Priorities should be informed through consideration of criteria such as:

- Level of impact - for achieving the Cycle and Walking Network Plan objectives and aspirations
- Change making - actions resulting in major transformation or innovation
- Strategic rationale - linking the City Vision or other major strategies including the Healthy Lifestyle Kwinana Plan
- Affordability - resources capacity, ongoing funding and maintenance considerations, leveraging off private investment and the ability to stage actions
- Project readiness - degree to which projects can be readily commenced
- Complexity - degree to which actions involve multiple players, require longer lead times or major changes in legislation etc
- Sustainability - creation of resilient and adaptable physical environments, and
- Understanding critical paths and actions that have to happen first to support others

Table 3. Framework for Quality of Life Indicators for Kwinana

Theme	Domain	Indicators
Health Check	**Early Childhood**	Australian Early Development Index
	Mental health	Psychological distress
	Physical health	Quality of Life
		Obesity
		Prevalence of Type 2 Diabetes
		Adult Health Risk
		Adequate physical exercise
Sense of Place	**Personal & Community Safety**	Perceptions of Safety
		Incidence of Crime (person/property)
	Citizen Engagement	Opportunity to Have a Say on Important Issues
		Perceptions of Involvement in Local Issues & Community Activities
	Community Connectedness	Perceptions of Feeling Part of the Community
		Volunteering rates
		Youth Earning and Learning
Public Open Space	**Quality of spaces**	Quality / appearance of public space playgrounds, parks and reserves
		Quality of Streetscapes
Movement Networks	**Connectivity between destinations**	Public transport patronage
		Dedicated walking and cycling trails
		Road safety
		Transport limitations
	Safety	Perceptions of traffic safety
Community Facilities & Key Destinations	**Services Availability**	Perceptions of Access to Services and Facilities
		Access to Services (shops, cafes, restaurants etc)
		Opportunities to Participate in Sporting and Recreation Activities
		Major Services Presence
	Destinations	Distance to Primary Education Services
		Distance to Secondary Education Services
		Journeys to Work
		Employment rate
Housing Diversity	**Housing choice**	Housing affordability
		Dwelling structure
		Household structure

4.1 Health Check

Theme	Domain	Indicators
Health Check	Early Childhood	Australian Early Development Index
	Mental Health	Psychological Distress
		Quality of Life
	Physical Health	Obesity
		Type 2 Diabetes
		Adult Health Risk
		Adequate physical exercise

DOMAIN INDICATORS

Australian Early Development Index

The Australian Early Development Census (previously known as the Australian Early Development Index or AEDI) is a population measure of young children's developmental progress as they enter school. The AEDI is a population measure of young children's development based on a teacher-completed checklist and measures five developmental domains:

- Physical health and well being
- Social competence
- Emotional maturity
- Language and cognitive skills
- Communication skills and general knowledge
- Social competence

According to the Australian Early Development Census (AEDC), 22 per cent of children starting school are developmentally vulnerable in one or more AEDC domains (physical health and wellbeing; social competence; emotional maturity; language and cognitive skills; communication skills and general knowledge). On these figures, Australia has 60 000 developmentally vulnerable children in their first year of formal, full-time school (Commonwealth of Australia, 2016). These children are less likely to make successful transitions to school and are at risk of poorer long-term educational outcomes.

Psychological Distress

The remarkable progress in physical and material wellbeing for most Australians over the twentieth century has not necessarily been matched by gains in mental and subjective wellbeing. Good mental health is fundamental to the wellbeing of individuals, their families and the population as a whole. Although largely 'invisible', mental health problems and mental illness are a major cause of poor health in Victoria. It is estimated that they will affect more than one in five adults in their lifetime. Mental health problems and mental illness include a range of cognitive, emotional and behavioural disorders that interfere with the lives and productivity of individuals (communityindicators.net.au).

Quality of Life

Quality of life measures the fit between a person's hopes and expectations and their present experience. Objective quality of life is about fulfilling the societal and cultural demands for material wealth, social status and physical well being, whereas subjective quality of life is about feeling good and being satisfied with things in general. The overall quality of life reflects the difference, that is, the gap between the hopes and expectations of a person and their present experience.

Obesity

The World Health Organisation has declared that obesity is a disease of pandemic significance, which threatens the developing world, as well as developed countries (Binns, 2006). The increase in the population who are considered obese (adults with a Body Mass Index greater than 30) has been increasing rapidly over the past twenty five years. In 1980, one in 14 Australians were obese. Based on current trends, by 2025, a third of the population could be obese (Binns, 2006). The health problems and consequences of obesity include muscular-skeletal problems, cardiovascular disease, some cancers, sleep apnoea, type 2 diabetes and hypertension (Department of Health and Aging, 2006).

Type 2 Diabetes

Type 2 diabetes is sometimes described as a 'lifestyle disease' because it is more common in people who do insufficient physical activity and are overweight or obese. It is strongly associated with high blood pressure, high cholesterol and an 'apple' body shape, where excess weight is carried around the waist.

Often, Type 2 diabetes has no symptoms , although common symptoms include: being more thirsty than usual; passing more urine; feeling tired and lethargic; slow-healing wounds; itching and skin infections; blurred vision; and mood swings. Long term effects include reduced lifespan, damage to vessels and arteries which can lead to cardio vascular disease, stroke, and heart attack. Other long term effects include eye problems, foot problems, erectile dysfunction, fungal infections, kidney disease and nerve damage.

Adult Health Risk

Research has shown that socio-economic and educational disadvantage is strongly linked to smoking. Addiction and substance misuse are social determinants of health. Alcohol dependence and misuse, illicit drug use and tobacco smoking are the biggest contributors to early mortality and morbidity (Keleher and Murphy, 2001). Smoking is a significant cause of many diseases, including coronary heart disease, stroke and numerous cancers, and it is one of the leading causes of death in Victoria. Among all lifestyle-related risk factors, smoking is responsible for the greatest burden of premature death and disability in the state. Tobacco smoking accounts for almost 8.2 per cent of disability-adjusted life years for Victoria.

Adequate Physical Exercise

Nationally, there is a strong interest in the health related benefits of exercise. Individuals who participate in physical activities are healthier in mind and body and have a reduced risk of cardiovascular and related diseases. Adequate levels of physical activity to derive health benefits may also be indicative of striking a balance between work and life and has links with mental health. Participation in sporting activities is also related to interactions with the wider community. Participation builds social cohesion and connectedness, thereby reducing isolation, a recognised social determinant to health.

Australian Early Development Index	
Measure	**Data Sources**
• Proportion of children "developmentally vulnerable" (0-10th percentile) on two or more AEDI domains	PHIDU (2017). *Social Health Atlas of Australia, Western Australia*
Key Findings	
Current State: • 11.8% of children in 2015 where identified as developmentally vulnerable in two or more domains (as compared to 10.5 for Greater WA). **Historical Trend** • Historically this has declined from 18.3% in 2009 and 17.7% in 2012.	
Future Impacts and Opportunities:	
▪ Children experiencing high rates of vulnerable and at risk across any of the domains are less likely to make successful transitions to school and are at risk of poorer long-term educational outcomes. This highlights the need to provide greater services for families with young children to enable early diagnosis of health concerns. ▪ **Good access to parks and natural areas of open space with facilities that encourage early childhood physical activity and nature-based play as well as engagement with other children within the community is important beyond the physical activity benefits but for creating a sense of place and community.**	

Psychological Distress	
Measure	**Data Sources**
• ASR per 100 people aged 18 years and over with high or very high psychological distress, based on the Kessler 10 Scale (K10) (2014-15)	PHIDU (2017). *Social Health Atlas of Australia, Western Australia*
Key Findings	
Current State: • 14.4 people aged 18 years and over were estimated to have high or very high psychological distress (as compared to 9.9 for Greater Perth)	
Future Impacts and Opportunities:	
▪ Parks and other areas of public open space provide local destinations for people to walk and cycle to and be active in; provide exposure to nature which can be restorative and positive mental health benefits; and places for social interaction which is critical for creating and maintaining community cohesion and building social capital. ▪ **The provision of public open spaces is thus a key factor in promoting active living and providing important physical, psychological and social health benefits for individuals and the community** (Heart Foundation, 2017).	
Evidence	

- Department of Health and Aged Care & Australian Institute of Health and Welfare (DHAC & AIHW) 1999c.
- National Health Priority Areas report: mental health 1998. Canberra: DHFS and AIHW.

Quality of Life	
Measure	**Data Sources**
• Community perceptions on their quality of life	Catalyse (2016) Community Services and Wellbeing Scorecard
Key Findings	
<u>What the Community Said:</u> • 60% of respondents classify the quality of life in Kwinana as 'thriving' – having positive views of their present life situation and have positive views of the next five years. • 37% of respondents had a moderate view of their present situation OR moderate OR negative view of their future. **<u>Current Response:</u>**	
Future Impacts and Opportunities:	
• A good sense of place can foster a positive emotional attachment to a neighbourhood and community, levels of interaction between members of the community and formal participation or involvement in neighbourhood and community organisations. • **More walkable and mixed-use environments with connected street networks promote neighbourly interactions, social capital and sense of community.** • **The provision of sports and recreation facilities are important places for regular social interaction and the development of a sense of community** (Heart Foundation, 2017).	
Evidence	
• Cummins, R. A., Eckersley, R., Pallant, J., Van Vugt, J., Misajon, R. (2003). Developing a National Index of Subjective Wellbeing: The Australian Unity Wellbeing Index. Social Indicators Research, 64, 159 – 190.	

Obesity	
Measure	**Data Sources**
• Percentage of people who are obese according to a Body Mass Index (BMI) of 30 or greater	PHIDU (2017). *Social Health Atlas of Australia, Western Australia* Catalyse (2016) Community Services and Wellbeing Scorecard
Key Findings	
<u>Current State:</u> • 30.7 of people aged 18 years and over who were estimated to be obese (as compared to 23.4 for Greater Perth) • 18.7 of children aged 12-17 years who were estimated to be obese (as compared to 19.2 for Greater Perth) **<u>What the Community Said:</u>** • 45% of respondents reported to consume 1+ fast food meal a week	

Future Impacts and Opportunities:
• **Evidence indicates that the presence of footpaths is important to encourage general and recreational walking across the age groups.** • **Proximity to bus stops and rail stations has also been positively associated with active transportation and walking for adults and older adults.** • The design of the public transport stops should also provide both shade and shelter and accommodate seating or places to lean – making public transport more accessible for users who have difficulty standing for extended periods, such as the elderly. • Improve infrastructure and promotion of the health benefits of increase levels of physical activity (Heart Foundation, 2017).
Evidence
• Department of Health and Ageing, Australian Government, ***About Overwieght and Obesity,*** 2006 • Flood V, Webb K, Lazarus R & Panf G 1999, 'Use of self-report to monitor overweight and obesity in populations: some issues for consideration', Australian and New Zealand Journal of Public Health, vol. 24, pp. 96–9. • Australian Institute of Health and Welfare & Australian Department of Health and Family Services 1997, First report on national health priority areas 1996, Canberra. • World Health Organisation 1997, Obesity: preventing and managing the global epidemic, Geneva. • Australian Bureau of Statistics 2001, National Health Survey 2001, cat. no. 4364.0, Canberra.

Type Two Diabetes	
Measure	**Data Sources**
• ASR (Age Standard Rate) per 100 estimated number of people aged 18 years and over with diabetes mellitus	PHIDU (2017). *Social Health Atlas of Australia, Western Australia*
Key Findings	
Current State: • 6.3% of people aged 18 years and over are estimated to have diabetes mellitus within Kwinana (as compared to 5.5 for Greater Perth).	
Future Impacts and Opportunities:	
• Type 2 diabetes is sometimes described as a 'lifestyle disease' because it is more common in people who do insufficient physical activity and are overweight or obese. It is strongly associated with high blood pressure, high cholesterol and an 'apple' body shape, where excess weight is carried around the waist. • **Evidence indicates that connected street networks facilitate active walking for transport for all age groups.** • **Street trees provide a multitude of environmental, economic, social, and health and wellbeing benefits and are an important consideration in the planning and design processes of our urban (and suburban) areas for enhancing walkability** (Heart Foundation, 2017).	
Evidence	
• Austin, T., Shoemark, S., Stokes, S., Stone, S., and Terril, A. (2001). Part 1-Developing A Draft Set of Sustainability Indicators for the Shire of Cardinia. Graduate School of Environmental Science, Monash University, November 2001.	

Adult Health Risk	
Measure	**Data Sources**
• ASR per 100 people aged 18 years and over with a waist measurement estimated to indicate an increased/substantially increased risk of developing chronic disease	PHIDU (2017). *Social Health Atlas of Australia, Western Australia*
Key Findings	
Current State: • 61.1 people aged 18 years and over who were estimated to be at risk of developing chronic disease (as compared to 56.5 for Greater Perth). **What the Community Said:** • 45% of respondents reported to have excellent or very good health.	
Future Impacts and Opportunities:	
• Integrated community facilities play a vital role in creating healthy communities, enhancing wellbeing, and building social networks. • **Shared use of sport and recreation facilities helps to increase community access to these services, as well as providing open spaces of a sufficient size to accommodate sporting spaces and infrastructure.** These are important places for regular physical activity, social interaction and the development of a sense of community (Heart Foundation, 2017).	
Evidence	
• Department of Health and Ageing, Australian Government, Fact Sheet, How Smoking Can Harm You, 2007. • Department of Human Services Victoria, 2005, The Victorian burden of disease study: morbidity and mortality in 2001, Melbourne.	

Adequate Exercise	
Measure	**Data Sources**
• Portion of the community who exercise daily	(Catalyse, 2016)
Key Findings	
What the Community Said: • 41% of respondents identified their level of activity as active or very active	
Future Impacts and Opportunities:	
• Good access to recreational facilities is associated with physical activity among children, adolescents, adults and older adults. • **The creation of compact mixed-use neighbourhoods with a diverse mix of co-located destinations (including employment, education, retail and recreation land uses) integrated with public transport and within close proximity of a variety of residential dwelling types allows residents to undertake and fulfil a variety of daily activities and needs (i.e., live, work, play) in their neighbourhood and encourages active and sustainable modes of transport** (Heart Foundation, 2017).	
Evidence	
• Cardiovascular Disease (Clinical) DSS - Exported from METeOR (AIHW's Meta Data OnLine registry) • Egger, G., Donovan, R., Giles-Corti, B., Bull, F. & Swinburn, B. (2001). Developing National Physical Activity Guidelines for Australians. ***Australian and New Zealand Journal of Public Health, Vol 25(6)***, 561-563.	

4.2 SENSE OF PLACE

Theme	Domain	Indicators
Engaged & Connected Communities	Personal & Community Safety	Perceptions of Safety
		Incidence of Crime
	Citizen Engagement	Opportunities to Have a Say on Important Issues
		Perceptions of Involvement in Community Activities
	Community Connectedness Citizen Engagement	Feeling Part of the Community
		Volunteering
		Youth Earning and Learning

DOMAIN INDICATORS

Perceptions of Safety
Neighbourhoods which are perceived as safe, foster community participation, encourage physical activity, community connectedness and add to the health and well-being of local residents and visitors. Neighbourhood safety can only be achieved through the development and support of partnerships, within local communities, with business, residents, community groups, police, agencies and councils, which identify local solutions to local issues. The built environment and the way neighbourhoods are designed and maintained, impact greatly on perceptions of safety and are critical factors in any strategy for improving safety in neighbourhoods.

Crime (persons/property)
Crime impacts negatively on the community in terms of personal security, the attractiveness of an area for recreation, and on general amenity. The incidence of crime is both a cause and symptom of low quality of life, and is associated with poverty, exclusion and the need for support services.

Opportunity to Have a Say on Important Issues
Community wellbeing depends on people having a say on important issues and a sense of choice or control over their lives. In a democratic community, people participate in decision making via the local government. People have confidence that government will make good decisions so that individuals feel that their voice is being heard in the wider community leading to greater community wellbeing.

Perceptions of Community Involvement in Local Issues & Activities

An active community is involved in local issues and activities moving beyond those managed by local government. Community involvement in local issues and activities transfers' knowledge amongst community members leading to greater collective knowledge, community strength and social connectedness as individuals assemble and mobilize on issues and activities significant to their community. A strong community is empowered, supportive and resilient leading to increased community wellbeing.

Feeling Part of the Community

Community strength is found in the human relations that people draw upon for identity, interaction and support. A strong community is one where people understand and work towards sustainability and is inclusive of their most disadvantaged groups. To do this people need to be involved, feel capable of working through issues and feel supported by their fellow citizens.

Volunteering

The number of volunteers in the community is a measure of community engagement and social connectedness. The volunteer rate is influenced by age, gender and the current social climate. Although difficult to measure, there is a strong interest among economic analysts in the value of unpaid work because of its significance and because of linkages between unpaid work and the market sector of the economy (ABS 2002).

Youth Earning & Learning

In 2012 a quarter of Australians aged 18-24 were not studying, learning new skills or working, according to the COAG Reform Council. In the same year, our teenagers were three times more likely to be unemployed than adults. Youth living in areas of high disadvantage are particularly at risk of disengaging from work or study. If a young man or woman comes from a home where neither parent works, they are less likely to have the family contacts to land that all-important first job. And, without the financial means to access further training they face a double barrier (Mission Australia. 2012).

Perceptions of Safety	
Measure	**Data Sources**
• ASR per 100 - Estimated number of people aged 18 years and over who felt very safe/safe walking along in local areas after dark.	PHIDU (2017). *Social Health Atlas of Australia, Western Australia* Catalyse (2016) Community Services and Wellbeing Scorecard
Key Findings	
<u>Current State:</u> • 2014 estimates show 33% of people aged 18 years and over who felt very safe/safe walking along in local areas after dark (as compared to 48.5% for Greater Perth) **<u>What the Community Said:</u>** • Safety and security is seen as a key area to address in the City of Kwinana (Catalyse, 2016)	
Future Impacts and Opportunities:	
• Residents who feel unsafe in their local neighbourhood may constrain their physical and social activities, especially in public places and spaces, negatively impacting on their levels of physical activity and sense of community or social capital, which in turn deters people from walking in their neighborhood. • **Sport and recreation centres / facilities should be located within walkable distances and/or supported by public transport routes with good pedestrian and cycle way access, well-lit entrances and boundaries in accordance with Crime Prevention Through Environmental Design (CPTED) principles.** This includes the provision of well-lit car parks, footpaths and secure cycle storage areas for safe access after dark. Pedestrian routes should also be planned away from areas of potential concealment (Heart Foundation, 2017).	

Incidence of Crime (Person/Property)	
Measure	**Data Sources**
• Rate of offences against the person (excluding domestic violence incidents) per 100,000 people. Rate of offences against property per 100,000 people.	(Western Australian Police, 2016)
Key Findings	
<u>Current State:</u> • Over the last five years, the dominate crime statistics have been recorded for assault (117) and burglary (89).	
<u>Future Impacts and Opportunities:</u>	
• In recent years, much consideration has been given to the concept that the design of the built environment can lead to a reduction in the fear and incidence of crime and an improved quality of life. • Crime prevention through environmental design is based on the principles that peoples' behaviour within the urban environment, in terms of the possibility of offending as well as an individual's perceptions about their safety, is influenced by the design of that environment.	

- **Attributes of the built environment and street design that promote visibility and natural surveillance or reflect social control and place attachment, have well documented associations with feeling safe.**
- **A mix of uses, different building designs and the creation of vibrant and inviting town centres are also effective tools in designing out crime. Neighbourhood and town centres should have a range of uses and activities that generate activity at different times of the day and night. Night-time activation of places can also be accomplished through the provision of adequate street lighting and illumination across footpaths, entrances to buildings and at bus stops and train stations.**
- Permeable fencing, landscaping and surveillance of the area from buildings and land uses also help to create opportunities for passive surveillance (healthyactivebydesign.com.au).

Opportunity to Have a Say on Important Issues	
Measure	**Data Sources**
▪ People who feel they can have a say on important issues: expressed as a % of the adult population.	Catalyse (2016) Community Services and Wellbeing Scorecard
What the Community Said: • The local community feel the City clearly explains the reasons for its decisions and how residents views have been taken into account. • The City has a strong social media presence enabling the community to have their say on important issues	
Future Impacts and Opportunities:	
• **Community engagement allows for people to gain better connections into and within the community, it ensures that services are designed to meet specific needs of the people using them.** • It is recommended that online surveys be regularly utilised by the City to enable the community to have a say and capture ideas and levels of satisfaction with regard to local planning, facilities, events and spaces e.g. Social Pinpoint (socialpinpoint, 2016) which provides a simple online tool to engage with communities and stakeholders, reaching a broader audience and increasing participation rates.	

Perceptions of Involvement in Community Activities	
Measure	**Data Sources**
▪ People who feel it is an active community where people get involved in local issues and activities, expressed as a percentage of the adult population.	Catalyse (2016) Community Services and Wellbeing Scorecard
Key Findings	
What the Community Said: • 65% of respondents belong to 1 or more groups or associations.	
Future Impacts and Opportunities:	
• Community involvement keeps local society functioning through connecting people and it creates a sense of ownership in the local area. Greater levels of community involvement will bring greater levels of community	

investment both socially and fiscally promoting the sense of community and creating an environment the community can be proud of.

- A socially sustainable community is one with many connections and a high level of volunteering.
- **Having a mix of places within walking and cycling distances where they can meet and interact with other people (both deliberately and through chance encounters) encourages social interaction and promotes lively and activated neighbourhoods that make people feel connected – both to each other and their neighbourhood** (Heart Foundation, 2017).

Perceptions of Feeling Part of the Community	
Measure	**Data Sources**
▪ Satisfaction with feeling part of the community.	Catalyse (2016) Community Services and Wellbeing Scorecard
Key Findings	
<u>What the Community Said:</u> • 51% of respondents felt like they belonged in the local community. This is significantly lower than industry comparison scores.	
Future Impacts and Opportunities:	
• A growing body of evidence suggests that the way we design and build our neighbourhoods and communities affects residents' social connections and interactions, their sense of community and social capital which in turn may influence their levels of physical activity and mental health. • A sense of community creates a shared faith that everyone is committed to creating a better Kwinana. It creates a sense of belonging and trust while fulfilling the needs of the community in terms of a support network, conversation and inspiration. It creates positive experiences with others to promote residents to feel involved and live in the town longer. • **Investment in social infrastructure can help build the social capital and fabric of a community by enabling active living, learning opportunities, social interactions and supporting programs that help people innovate, express themselves and adapt to major life events. It is social capital that makes a community liveable, inclusive, competitive and diverse** (Heart Foundation, 2017).	

Volunteering	
Measure	**Data Sources**
• People who do voluntary work for organisations or groups, as a percentage of the population.	PHIDU (2017). *Social Health Atlas of Australia, Western Australia* RAI, (2016) Insight Australia's Regional Competitiveness Index
Key Findings	
<u>Current State:</u> • 11.30% of people aged 15 years and over participated in voluntary work (as compared to 15.6% for Greater Perth).	

- Analysis of the voluntary work performed by the population in the City of Kwinana in 2011 compared to Greater Perth shows that there was a lower proportion of people who volunteered for an organisation or group.
- Overall, 11.3% of the population reported performing voluntary work, compared with 15.6% for Greater Perth.
- (National ranking, 531 out of 563 LGAs)

Future Impacts and Opportunities:

- Volunteers contribute economic value to businesses and organisations that could otherwise not afford to pay employees. **Given the high participation of volunteering within the sport and recreation sector, initiatives should be explored to promote volunteering within other sectors which may benefit from this support.**
- Volunteering provides mentoring and role modelling for the young and disadvantaged within the community. It is recognised as a stepping stone for people to gain new skills, leading to future employment and career opportunities.
- Volunteering opportunities should correlate with recognised industry growth sectors. The benefit of this is multi-faceted in that it provides local youth with exposure to emerging industry sectors, provides local resources to new/growing businesses and provides initiatives to help retain residents.

Learning and Earning	
Measure	**Data Sources**
• % of people learning or earning at ages 15-19 years old.	PHIDU (2017). *Social Health Atlas of Australia, Western Australia* RAI, (2016) Insight Australia's Regional Competitiveness Index

Key Findings

<u>Current State:</u>

- 65.7% of people between the ages of 15 – 19 are learning or earning (as compared to 79.9% for Greater Perth)
- National ranking 479 out of 563 LGAs

Future Impacts and Opportunities:

- Traditional neighbourhoods tend to contain a diverse mix of destinations integrated within close proximity of a variety of residential dwelling types. This allows residents to undertake and fulfil a variety of daily activities and needs (i.e., live, work, play) in their neighbourhood.
- **A key intent of creating walkable neighbourhood environments should be to provide for the diverse daily needs of a community through the provision of a mix of destinations that attract people for a variety of activities.**
- Living within close proximity to a mix of destinations is associated with higher levels of active transport across all age groups (Heart Foundation, 2017).

4.3 PUBLIC OPEN SPACE

Theme	Domain		Indicators
Public Open Space	Quality of spaces		Quality and appearance of public space playgrounds, parks and reserves
			Appearance of Streetscapes

DOMAIN INDICATORS

Appearance of Public Open Space

Satisfaction with the built environment contributes to overall feelings of well-being. The amount and type of open space is a key element of urban design and impacts on people's perceptions of 'neighbourliness' and safety. The type of open space also determines the range of recreation and leisure opportunities. Open space is often centred around areas of specific importance such as historic buildings, cultural centres, icons, parks and gardens. Open space acts to cement relationships within our communities and with the natural world. The amenity value of open space can be seen in the high price real estate commands in areas with views, ocean outlooks or surrounding parks and gardens.

Appearance of Streetscapes

Neighbourhood aesthetics determine the general appeal and presentation of the neighbourhood and whether it provides a pleasant pedestrian-orientated environment. The characteristics of neighbourhood streets can help create convivial environments for walking for all age groups. The street should also be thought of as a social space, rather than just a channel for movement - providing characteristics make the street a desirable place for stationary and lingering social activities and provide opportunities for short-term interactions between people (healthyactivebydesign.com.au).

Appearance of Public Open Space	
Measure	**Data Sources**
• Perceptions of public open space	Catalyse (2016) Community Services and Wellbeing Scorecard
Key Findings	
What the Community Said: • Overall, the local community have indicated the local playgrounds, parks and reserves perform quite well. • Participants desire better quality parks with new or upgraded playgrounds, shading facilities, and dog-exercise areas **Current Response:** • Recent development of the Adventure Park in Calista Oval creating new destination to the city centre.	
Future Impacts and Opportunities:	
• Perceived park aesthetics, condition and safety have also been associated with increased park visitation and physical activity levels within parks. Attractive park aesthetics appear to promote recreational walking, whereas physical incivilities appear to deter recreational walking for adults and older adults (Heart Foundation, 2017). • **Enhance local parks, playgrounds and reserves – to cater for a variety of users.** • **Enhance pedestrian and cycle linkages to the newly developed Adventure Playground in Calista Park**	
Evidence	
• Queensland Health. (2005). Health impact assessment: issue guidelines for natural and built environment determinants of health, February. • World Health Organisation. (2003). Social determinants of health: the solid facts. 2nd edition, edited by Richard Wilkinson and Michael Marmot. • Essential Services Commission (2010). *Reducing the Reporting Burden on Local Government*, Scoping Paper, August.	

Quality of Streetscape	
Measure	**Data Sources**
• Perceptions of the quality of local streetscapes	Catalyse (2016) Community Services and Wellbeing Scorecard
Key Findings	
What the Community Said: • Respondents want tidier streetscapes, more trees and better verge maintenance. • The images of the City of Kwinana as the City of Trees and Parks was highly valued by respondents. • Lack of maintenance was seen as a key issue creating unattractive areas.	
Future Impacts and Opportunities:	
• Local streets and footpaths are the most frequently used facilities among adults for physical activity. **Research suggests there is a relationship between environmental quality and people's willingness to walk; they are more likely to walk where they feel comfortable and where the environment is pedestrian-friendl**y (Heart Foundation, 2017).	

4.4 Movement Network

Theme	Domain	Indicators
Movement Network		Public Transport Patronage
		Use of Walking and Cycle Trails
		Transport Limitations
		Perceptions of Traffic Safety

DOMAIN INDICATORS

Public Transport Patronage

Public transport is seen as a key sustainability indicator as it has wide-ranging impacts on the environment, employment options and access to services. Adequate public transport is particularly important for the young, elderly or disadvantaged who are often without a car and have difficulty accessing services, facilities and social networks. For a transport network to be a viable alternative to the car, pedestrian and cycle paths need to be integrated with public transport systems (The Australia Institute and Newcastle City Council, 2000).

Transport networks have the additional benefit of increasing physical activity. Increasing physical activity improves physical and mental well-being, encourages social interaction and lowers the risk of heart, cardiovascular and respiratory diseases. Escalating petrol prices are encouraging more people to use public transport and leave the car at home. However, not all communities have adequate infrastructure or public transport services. People's perceptions of practical non-car transport opportunities are important in determining whether the transport network is effective. Increased public transport has significant potential to reduce road accidents, traffic congestion, and air pollution (Austin et al., 2001).

Dedicated Public Walking and Cycle Trails

For a transport network to be a viable alternative to the car, pedestrian and cycle paths need to be integrated with public transport systems (The Australia Institute and Newcastle City Council, 2000). Transport networks have the additional benefit of increasing physical activity. Increasing physical activity improves physical and mental well-being, encourages social interaction and lowers the risk of heart, cardiovascular and respiratory diseases.

Transport Limitations

Access to both public or private transportation is essential for citizens to contribute to their community and reach their potential. Safe, reliable affordable transport is a key determinant of people's opportunities to access health services and programs, education and secure employment. It is especially important for the elderly to have access to public transportation. Limitation in regards to transport is related to social isolation and also has a relationship with sedentary lifestyles.

Perceptions of Traffic Safety

It is important that our roads are safe for all users, as a sustainable community is one that has many integrated transport options so that residents are not forced to rely on the car. It is important however that increased levels of walking activity do not lead to higher numbers of pedestrian and cycling casualties. Despite increased motor vehicle use, Australia has made considerable gains in reducing deaths and injuries from motor vehicle accidents by introducing legislation for compulsory seat belt requirements, the installation of red light and speed cameras, upgrading roads improvements to vehicle designs (Australian Bureau of Statistics, 2004) and enforcing drink driving laws. The number of road fatalities per 100,000 residents is used as an indicator in many national and international indicator suites, including in the State of the Environment Report (Human Settlements) and the Australian Bureau of Statistics, Measures of Australia's Progress.

Public Transport Patronage	
Measure	**Data Sources**
• % of local residents who caught public transport to work	ABS (2011) Community Profile Catalyse (2016) Community Services and Wellbeing Scorecard

Key Findings

Current State:

- In 2011, there were 1,322 people who caught public transport to work (train, bus, tram or ferry) in City of Kwinana, compared with 8,837 who drove in private vehicles (car – as driver, car – as passenger, motorbike, or truck).
- Analysis of the method of travel to work of the residents in the City of Kwinana in 2011, compared to Greater Perth, shows that 10.7% used public transport, while 71.4% used a private vehicle, compared with 10.4% and 68.9% respectively in Greater Perth.

Historical Trend:

- Historically, a larger percentage of people have chosen to travel by train (0.9% compared to 6.7% for Greater Perth).

What the Community Said:

- Residents desire greater public transport services. Hotspots included Casuarina and Wellard.
- Limited transportation links to services are seen as key areas for concern given the growing population.

Future Impacts and Opportunities:

- **Increase residential densities around key centres to increase PT patron numbers required for regular service routes.**
- The City of Kwinana's commuting statistics reveal the main modes of transport is by private vehicle to get to work. There are a number of reasons why people use different modes of transport to get to work including the availability of affordable and effective public transport options, the number of motor vehicles available within a household, and the distance travelled to work.
- Research has indicated that public transport stops located in areas with well-connected gridded streets are more heavily used than those in areas with less well connected streets.
- **Proximity to bus stops and rail stations has also been positively associated with active transportation and walking for adults and older adults. When parents perceive public transport services to be limited, their children are less likely to walk or cycle.**

Dedicated Public Walking and Cycle Trails	
Measure	**Data Sources**
• % of local residents who rode or walked to work	ABS (2011) Community Profile Catalyse (2016) Community Services and Wellbeing Scorecard

Key Findings

Current State:

- In the City of Kwinana 135 people rode their bike or walked to work in 2011.

Historical Trend:

- A smaller percentage of people have chosen to commute by bus or walk to work (1.7% compared to 3.7% and 0.9% compared to 2.2%) as compared to Greater Perth.

What the Community Said:

- 78% of respondents never cycle to destinations instead of driving.
- Only 12% walk to local destinations instead of driving.

Future Impacts and Opportunities:

- Numerous studies indicate that heavy traffic volumes negatively influence children and adolescent physical activity, particularly active transport. There is consistent evidence that greater traffic safety and/or presence of suitable road crossings is positively associated with children and adolescent active transport and physical activity.
- **An important consideration for recreational and transport walking and cycling is the presence and continuity of pedestrian/cycle infrastructures. Pedestrian infrastructure includes the built and planted features that provide amenities or affect mobility, safety and comfort – these include the basic street pattern and road classification, as well as the provision of footpaths, pedestrian crossings, street trees, aesthetics and furniture.**
- Connected road networks have been shown to be associated with more walking in older adults and children, but only when traffic-related issues are managed and the local streets are perceived to be safe (Heart Foundation, 2017).

Transport Limitations	
Measure	**Data Sources**
• % of households having access to two or more motor vehicles.	ABS (2011) Community Profile

Key Findings

Current State:

- Analysis of the car ownership of the households in the City of Kwinana in 2011 compared to Greater Perth shows that 85.2% of the households owned at least one car, while 5.9% did not, compared with 87.5% and 6.0% respectively in Greater Perth.
- Of those that owned at least one vehicle, there was a similar proportion who owned just one car; a smaller proportion who owned two cars; and a similar proportion who owned three cars or more.
- Overall, 32.0% of the households owned one car; 34.9% owned two cars; and 18.4% owned three cars or more, compared with 32.0%; 37.1% and 18.4% respectively for Greater Perth.

Future Impacts and Opportunities:

- **The ability of the population to access services and employment is strongly influenced by access to multiple modes of transport.** The number of motor vehicles per household in the City of Kwinana quantifies access to private transport and will be influenced by Age Structure and Household Type, which determine the number of adults present; access to Public Transport; distance to shops, services, employment and education; and Household Income.
- Depending on these factors, car ownership can be seen as a measure of advantage or disadvantage, or a neutral socio-economic measure, which impacts on the environment and quality of life.

Perceptions of Traffic Safety	
Measure	**Data Sources**
• Perceptions of traffic safety issues	Catalyse (2016) Community Services and Wellbeing Scorecard

Key Findings

What the Community Said:

- Dangerous driving (honing) registers the highest level of concern from the community, specifically in Bertram and Leda areas.
- This is followed by home burglaries or break-ins and alcohol and drug use.
- Concerns with traffic management are closely related to safety and security, in particular speeding. Residents want greater control over hoon behaviour and the use of off-road trail and motor bikes.

Future Impacts and Opportunities:

- Measures suggested by the community include: reducing opportunity for dangerous driving within local streets; greater police presence and use of CCTV – creating safe environments for children; more lighting around trouble areas.
- Numerous studies indicate that heavy traffic volumes negatively influence children and adolescent physical activity, particularly active transport. **There is consistent evidence that greater traffic safety and/or presence of suitable road crossings is positively associated with children and adolescent active transport and physical activity.**
- The connection between traffic speed and risk of injury to pedestrians and cyclists is undisputed. Evidence indicates that lowering traffic speeds can have positive effects on both injury reduction and increased walking and cycling rates.
- Research suggests that there is a relationship between environmental quality and people's willingness to walk or cycle; they are more likely to walk where they feel comfortable and where the environment is pedestrian/cycle-friendly. Street design should also be thought of as a social space, rather than just a channel for movement - providing characteristics make the street a desirable place for stationary and lingering social activities and that provide opportunities for short-term interactions between people.
- **Buildings that are designed with more diverse street frontages or facades, especially at the first and second-floor levels, contributes to a varied streetscape and provides visual interest and prompts people to linger, creating livelier streets** (Heart Foundation, 2017).

4.5 Community Facilities & Key Destinations

Theme		Indicators
Community Facilities	Services Available	Perceptions of Access to Services and Facilities
		Opportunity to participate in Sports and Recreation
		Access to Services (Cafes, shops, restaurants)
		Major service presence
	Destinations	Distance to Primary Education Services
		Distance to Secondary Education Services
		Journeys to work
		Employment Rate

DOMAIN INDICATORS

Perceptions of Access to Services & Facilities
Access to services is a measure of community connectivity in terms of transport infrastructure, physical distance and urban planning. It is believed that when community members have access to the services they need, when they need them, they are more likely to have feelings of civic engagement and well-being. Not having access to such services can place vulnerable groups at greater disadvantage and signal pockets of social isolation (Bastian, 2000).

Access to Services
A community's ability to attract and retain population can be largely attributed to the presence and quality of major services (social infrastructure). Social infrastructure can act as an 'attractor' which encourages people to live in, or visit a particular area. Given that a key component of a sustainable community is diversity, providing a range of quality social infrastructure can help attract/retain a diverse population. The NHS London Healthy Urban Development Unit (2008) suggest that "People want to live in areas that are served by good schools, good health services, high quality open spaces and recreational activities, all in accessible and convenient locations".

Opportunities to Participate in Sporting & Recreation Activities

This indicator is a measure of participation in the wider community. Participation builds social cohesion and connectedness, thereby reducing isolation. By building a collective identity, event and cultural facilities also build community strength. Community and cultural events provide a range of socially inclusive activities that contribute to overall community well-being. Both culture and leisure activities assist in developing national identity and forming community networks and bonds crucial to social cohesion. Industries associated with culture and leisure are growth industries and are thus important to Australia's economic wellbeing. The culture and leisure sector also contribute to economic development through facilitating creativity, innovation, and self-reflection (ABS, 2001).

Major Services Presence

These indicators includes the availability of services as a function of distance and accessibility for groups most likely to have a high need for services. Included services are: health, childcare, respite care, complementary medicines, mental health and outreach services. When measuring accessibility, limited transport options for community members such as parents of young children, young people, older people and people with a disability are also sometimes included.

Access to Primary Education Services

Though the provision of education may be widespread and diverse throughout Australia, equitable access to this education is constrained and limited by factors associated with distance and with population density. These make access to education provisions both more difficult and more expensive.

Access to Secondary Education Services

Though the provision of education may be widespread and diverse throughout Australia, equitable access to this education is constrained and limited by factors associated with distance and with population density. These make access to education provisions both more difficult and more expensive.

Journeys to Work

Living within close proximity to employment and a mix of destinations is associated with higher levels of active transport across all age groups. Living within close proximity to destinations, such as shops and parks, are positively associated with transportation walking in adults and older adults.

Employment Rate

Employment for all is an important social goal. People out of a job may have a sense of less than full membership of the community. Improving employment options for young people, people with disabilities, indigenous people and older residents is important for a community that values people. Local employment options for residents will make the municipality a desirable place to live and reduce economic leakage and greenhouse gas emissions due to reduced travel demands. One of the key outcomes of local industry is local employment provision.

Adequate employment levels are an important social goal (Freebairn, 2005). Employment gives people the opportunity to make lifestyle choices and is associated with levels of personal satisfaction (Freebairn, 2005). Insufficient employment opportunities may lead to a decline in health and skill levels of unemployed people, family breakdowns and increasing crime rates (Austin et al., 2001).

Perceptions of Access to Services & Facilities	
Measure	**Data Sources**
• People who feel the area has good or very good facilities and services like shops, childcare, schools and libraries.	Catalyse (2016) Community Services and Wellbeing Scorecard
Key Findings	
What the Community Said: • The community highly value the local library's and Recquatic Centre located at the heart of the City. • 47% of respondents had accessed the Darius Wells Library and Recourse Centre in the last 12 months.	
Future Impacts and Opportunities:	
• Neighbourhoods with a mix of co-located destinations (for example at a neighbourhood or town centre) when supported and surrounded by a network of connected streets, paths and cycle ways, provide opportunities for active transport. Good public transport access creates environments that are also more conducive for walking and cycling as they provide local focal points for people to meaningfully and conveniently commute to within their neighbourhood. • **Ensuring neighbourhoods have access to a mix of shops, services and transport connections has positive implications beyond physical activity.** The provision of a mix of destinations and community facilities within the neighbourhood helps to attract a range of people of all ages and provides opportunities for casual and chance interactions with other members of the community as well as providing places and spaces for people of all ages to gather, meet friends and family and engage in social activities (Heart Foundation, 2017).	

Access to Services	
Measure	**Data Sources**
• Community perceptions of access to services	Catalyse (2016) Community Services and Wellbeing Scorecard
Key Findings	
What the Community Said: • Economic development is seen as lacking within the City. • Respondents want greater access to shops, cafes, restaurants, and telecommunication services in their local areas.	
Future Impacts and Opportunities:	
• The location of different land uses relative to one another has a strong impact on how people travel between, to and from them. • **The provision of mixed-use neighbourhood and town centres within walking distance from homes also makes alternative forms of transport such as walking, cycling or public transport use more viable and provides people with the option not to use the car** (Heart Foundation, 2017).	

Major Service Presence	
Measure	**Data Sources**
• Presence of major infrastructure such as university, TAFE, hospitals and other major facilities.	(RAI, 2016)
Key Findings	
Current State:	
• Currently the City has one major service provider being the local TAFE.	
Future Impacts and Opportunities:	
• **The location of key destinations such as employment, education, retail and recreation land uses close to homes is a key design feature of 'walkable' and sustainable neighbourhood design to encourage active transport.** • People living in walkable, mixed-use neighbourhoods have been shown to have higher social capital than those in car-oriented neighbourhoods (Heart Foundation, 2017).	

Perceived Opportunities to Participate in Sporting & Recreation Activities	
Measure	**Data Sources**
▪ Percentage of people who feel they have opportunities to participate in local sporting and recreational activities: expressed as a % of the adult population that are satisfied with parks, reserves and sporting grounds	Catalyse (2016) Community Services and Wellbeing Scorecard
Key Findings	
What the Community Said:	
• 39% of respondents had accessed the Recquatic Centre in the last 12 months.	
Future Impacts and Opportunities:	
• Integrated community facilities play a vital role in creating healthy communities, enhancing wellbeing, and building social networks. • **Shared use of sport and recreation facilities helps to increase community access to these services, as well as providing open spaces of a sufficient size to accommodate sporting spaces and infrastructure.** These are important places for regular physical activity, social interaction and the development of a sense of community (Heart Foundation, 2017).	

Distance to Primary Education Services	
Measure	**Data Sources**
▪ Average distance for residents to a primary school	(Regional Australia Institute, 2012) (Australian Curriculum Assessment & Reporting Authority, 2015)
Key Findings	
Current State:	

- The average distance for residents to travel to primary schools in Kwinana is 0.6km.
- (National ranking = 69 out of 563 LGAs)

Future Impacts and Opportunities:

- Access to primary, secondary, technical and further education and tertiary education services indicates the accessibility of essential education services. Children within close proximity to their school are more likely to walk or cycle, increasing their levels of daily activity and promoting a healthy lifestyle.
- Schools are an important daily destination to which children and adolescents may walk. Active commuting to school can contribute to children achieving recommended physical activity levels
- **Promoting active modes of travel to and from school can assist in developing a perception of safety in the area. If more children have the desire to walk/cycle to school greater initiatives can be implemented to promote walkability in the area with safe crossing and sidewalks** (Heart Foundation, 2017).

Distance to Secondary Education Services	
Measure	**Data Sources**
▪ Average distance for residents to a secondary school	(Regional Australia Institute, 2012) (Australian Curriculum Assessment & Reporting Authority, 2015)

Key Findings

Current State:

- The average distance for residents to travel to secondary schools in Kwinana is 2km.

Future Impacts and Opportunities:

- Children in close proximity to their school and much more likely to walk or cycle increasing their levels of independent mobility and promoting a healthy lifestyle, this is likely to occur in Kwinana.
- **An increase in infrastructure quality can offset competitive disadvantage and should be a focus for policy. However, bridging the basic access gap requires engagement in innovative use of technology and other resources that alleviate the tyranny of distance.**

Journeys to Work	
Measure	**Data Sources**
▪ % of local residents living and working in the area	ABS (2011) Community Profile

Key Findings

Current State:

- 20.4% of local residents live and work in the area.
- (79.6% work in the area, but live outside)

Future Impacts and Opportunities:

- Evidence from Austria confirms the importance of connected cycle lanes to commuter cyclists, whereas traffic safety and lack of bike storage and end-of-trip shower facilities appear to be barriers to cycling to work

- A number of infrastructure, programs and policies have been shown to increase cycling, these include the use on-street markings and/or the painting bike lanes onto the road surface or signage to visually reinforce the separation of areas for bicyclists and motorists.
- **Where conditions warrant, for example of busier roads, separate bikeways and vehicular traffic lanes with physical demarcations or adding a buffer between bicyclists and cars increases riders' confidence for cycling.**
- **When designing sites that include parking, consider how the provision, location and design of parking may affect the use of more active modes of travel such as walking, bicycling, and public transport.** Abundant car parking discourages active and transit mode use. Research from California indicates that increased supply of parking may result in reduced active transportation and public transit use, suggesting that when (cheap) parking is available, people use it. Designing car parking so as to reduce unnecessary car travel, particularly when walking, bicycling, and public transit are convenient alternatives are therefore important (Heart Foundation, 2017).

Employment Rate	
Measure	**Data Sources**
▪ % of labour force unemployed.	ABS (2011) Community Profile RAI, (2016) Insight Australia's Regional Competitiveness Index
Key Findings	
<u>Current State:</u> • 11.5% rate of unemployment in 2016 (as compared to 6% for Greater Perth) • (National ranking 501 out of 563 LGAs)	
Future Impacts and Opportunities:	
• Sense of community is defined as "a feeling that members have of belonging and being important to each other and a shared faith that members' needs will be met by the commitment to be together". Social capital is defined as "the social networks and interactions that inspire trust and reciprocity among citizens." • **Ensuring neighbourhoods have access to employment, shops, services and transport connections have implications beyond physical activity alone. Neighbourhoods that promote interaction between people tend to have higher stocks of social capital and sense of community.** For example, people living in walkable, mixed-use neighbourhoods have been shown to have higher social capital than those in car-oriented neighbourhoods. (Heart Foundation, 2017).	
Evidence	
• Freebairn, J. (2005). Opinion. Melbourne Institute News. September 2005. Melbourne Institute of Applied Economic and Social Research. Issue 9. • Austin, T., Shoemark, S., Stokes, S., Stone, S., and Terril, A. (2001). Part 1-Developing A Draft Set of Sustainability Indicators for the Shire of Cardinia. Graduate School of Environmental Science, Monash University November 2001.	

4.6 Housing Diversity

Theme	Domain	Indicators
Housing Diversity	Housing Choice	Housing affordability
		Dwelling structure
		Household structure

DOMAIN INDICATORS

Housing Affordability

Housing satisfies the essential needs of people for shelter, security and privacy. Shelter is recognised throughout the world as a basic human right. The adequacy or otherwise of housing is an important component of individual wellbeing. Housing also has great significance in the national economy, with its influence on investment levels, interest rates, building activity and employment. Affordability of housing will affect choice of location, access to employment, education, essential services and proximity to social and family networks (Onkaparinga, 2000).

The cost of housing is particularly significant to people on lower incomes. When costs are high, people have less residual income to spend on other essential household items. There is no accepted definition of housing affordability. It is a relative term that is about the capacity to enter the housing market; that is, cost and availability. The cost of housing relates to the prosperity of the community, the functioning of the economy, location choices relating to employment opportunities, and transportation issues.

Dwelling Structure

Dwelling Type is an important determinant of the City of Kwinana's residential role and function. A greater concentration of higher density dwellings is likely to attract more young adults and smaller households, often renting. Larger, detached or separate dwellings are more likely to attract families and prospective families. The residential built form often reflects market opportunities or planning policy, such as building denser forms of housing around public transport nodes or employment centres.

Household Structure

The City of Kwinana's household and family structure is one of the most important demographic indicators. It reveals the area's residential role and function, era of settlement and provides key insights into the level of demand for services and facilities as most are related to age and household types.

Housing Affordability	
Measure	**Data Sources**
▪ Median house valuation.	ABS (2011) Community Profile
Key Findings	
<u>Current State:</u> • At June 2016, the City of Kwinana had a median house valuation of $381,180, $119,045 lower than the median house valuation for Western Australia.	
Future Impacts and Opportunities:	
• Housing affordability remains a concern for new entrants to the market and those with lower disposable incomes. Housing diversity can make provision for housing that is more affordable to rent and buy. • **Affordable housing should also be located close to amenities such as public transport, employment, shops, schools and services. This be particularly relevant to those who do not own a car.** • **A diversity of housing types and tenures in new and established areas can help to meet these important equity needs** (Heart Foundation, 2017).	

Dwelling Structure	
Measure	**Data Sources**
▪ Dominant dwelling structure	ABS (2011) Community Profile
Key Findings	
<u>Current State:</u> • 90.4% of household types are separate houses • (7.2% medium density and 2.2% high density)	
Future Impacts and Opportunities:	
• Housing diversity is delivered through the provision of a range of dwelling products and sizes and is usually achieved by providing a wider range of lots sizes and promoting a variety of building forms. • **The provision of a diverse range of dwelling styles and densities also provides housing choice and ensures the housing needs of residents at different stages in life and increasingly diverse household types (e.g. young families, professionals, retirees, those with disabilities) are provided and catered for.** • By providing a greater housing and lifestyle choice, a more diverse range of people are also attracted to a location. • **Population and residential densities are critical in creating mixed-use neighbourhoods - providing the customers required to support local businesses. Higher densities also generally result in the creation of more compact uses of land decreasing the distances to between homes/residential land uses and destinations.** There is consistent evidence that the combination of higher residential densities and mixed land uses are positively associated with adults and older adults walking. The viability of public transport services also increases with increased population densities. • Studies have repeatedly shown that urban sprawl, as characterised by the low densities, long, winding street networks and separated land uses, decreases local walking and increases vehicle miles travelled. The evidence highlights a strong and consistent connection between higher residential density and mixed-use planning and walking, across all life stages (Heart Foundation, 2017).	

Household Structure	
Measure	**Data Sources**
▪ Dominant family structure	ABS (2011) Community Profile
Key Findings	
<u>Current State:</u> • In the City of Kwinana, 32% of households were made up of couples with children in 2011, compared with 32% in Greater Perth. • Analysis of the household/family types in the City of Kwinana in 2011 compared to Greater Perth shows that there was a similar proportion of couple families with child(ren) as well as a higher proportion of one-parent families. Overall, 31.7% of total families were couple families with child(ren), and 13.3% were one-parent families, compared with 31.6% and 9.9% respectively for Greater Perth. • There were a lower proportion of lone person households and a lower proportion of couples without children. Overall, the proportion of lone person households was 20.7% compared to 22.4% in Greater Perth while the proportion of couples without children was 23.7% compared to 25.7% in Greater Perth.	
Future Impacts and Opportunities:	
• **A diversity of housing types helps respond to the needs of communities at different stages of the life course and provides opportunities for communities where people can move home without leaving a neighbourhood.** For example, as people age, their first preference is often to stay living in their existing neighbourhoods (i.e. ageing in place), where friends and support networks are already well established. • **For older adults, designing and locating safe, affordable, well-connected housing and higher density housing with the aim of facilitating active lifestyles, social interaction, and creating a safe living environment with amenities for daily living is critical. Smaller, diverse housing types within the development/community will offer this flexibility.** Additionally, older adults, particularly women, are more fearful and more vulnerable to crime thus the design and location of housing is important to avoid people constraining their behaviour. • Living within close proximity to a mix of destinations is associated with higher levels of active transport across all age groups. • Evidence also suggests that walkable (i.e., denser, mixed-use and more connected) environments enhance the sense of community and social capital by encouraging and facilitating social ties or community connections through opportunities for residents to meet, interact and engage in their neighbourhood (Heart Foundation, 2017).	

5.0 REVIEW SUMMARY

REVIEW SUMAMRY

5.0. Review Summary

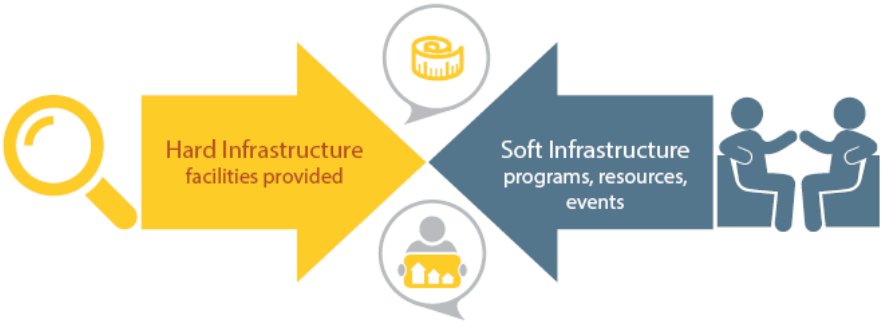
5.1 SOCIAL INFRASTRUCTURE REVIEW PROCESS

Following the review of a community's social infrastructure, it is important to understand this has both 'hard' and 'soft' elements. 'Hard' elements include health facilities and centres, education facilities, art and cultural facilities, recreational grounds and connections between. Ensuring good quality design outcomes within these elements is important for maximising their potential benefits to the community and value for money outcomes. As found within the review of major infrastructure, Kwinana has a good supply of facilities accommodating a range of activities and services. However, there is a gap in understanding of how well connected these facilities as well as their used in terms of the 'soft' programming and the quality of design to suit their purpose.

'Soft' elements may include programs, resources and services, as well as public art and cultural events that complement 'hard' elements and contribute to the formation of community. 'Hard' elements do not work successfully unless 'soft' elements accompany them. Public and private investment in social infrastructure is essential to build the social capital and fabric of the community. This enables active living, learning opportunities, social interactions and supporting programs that help people innovate, express themselves and adapt to major life events. It is social capital that makes the community liveable, inclusive, competitive and diverse (WAPC, State Planning Strategy 2050, 2014). In this regard, a detailed Social Services Review for Kwinana is a priority to understand the alignment of 'hard' and 'soft' elements, and where the future needs and provisions will be to provide for its social infrastructure.

No two places are the same and therefore there is no single blueprint for creating liveable, inclusive, competitive and diverse communities; it arises from an understanding of context and place. Often this is best delivered by outcome-based policy rather than by traditional planning models that focus on hard rather than soft infrastructure outcomes. An outcomes-based approach requires those designing and assessing strategies and proposals to have a holistic understanding of community wellbeing and place-making. Spaces and places are public areas which reflect the community needs, purpose and identity. Collaboration with the Kwinana community and the application of an appropriate response and design outcomes will be essential to the future prosperity of the City.

Figure 15. Social Infrastructure as both hard and soft elements



5.2 SOCIAL AND ECONOMIC INITIATIVES

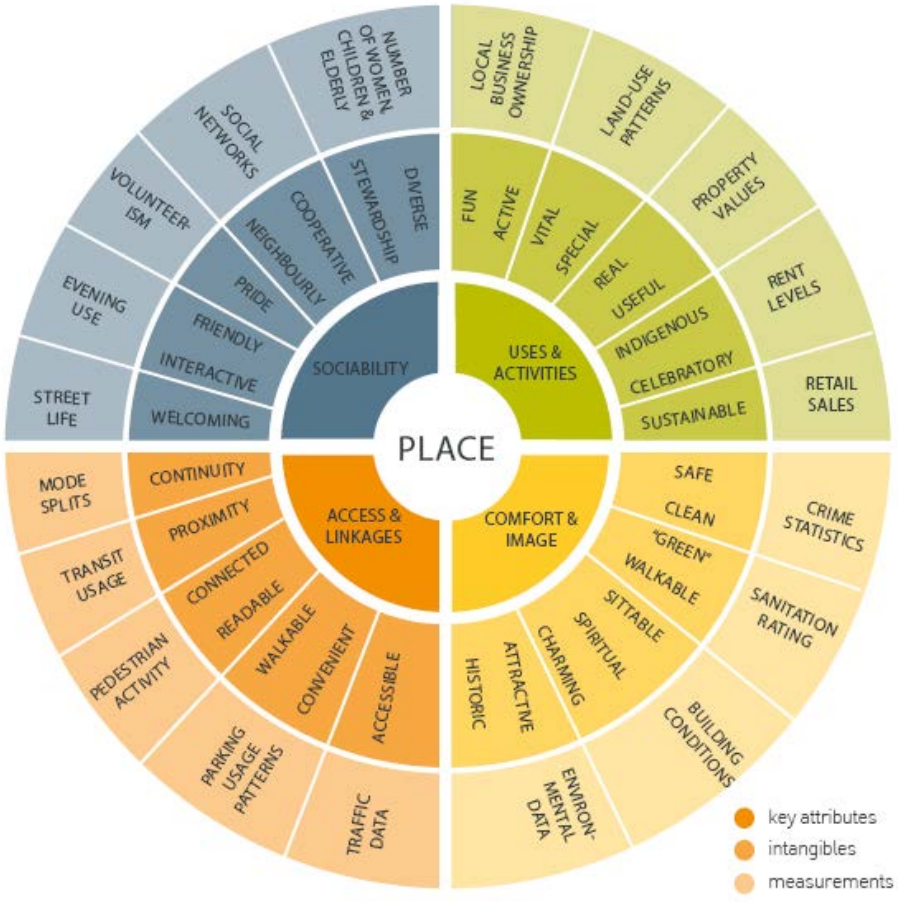
This review is an overview or spotlight on health and liveability issues in Kwinana. As such, it has been framed around liveability themes and initiatives that respond broadly to the overarching place based lens.

Measuring liveability: The Place Lens

Measuring liveability can be very challenging as people look for and value different things when searching for 'a place to call home'. Liveability is closely linked to place. It is therefore valuable to reference a place lens that considers both the intangible qualities of place and the measurable quantitative aspects to enable a more comprehensive assessment of the success of a place as a liveable community.

Capturing data for both the quantitative and qualitative aspects of liveability and place will enable the success of Kwinana as a place to live to be more clearly measured. This in turn will provide justification for future funding and service provision.

Figure 16. Place Lens



Source: Projects for Public Spaces, www.pps.org, 2016

There are many initiatives and programmes already in place across government agencies and other responsible parties that are aimed at improving liveability in Kwinana. The initiatives emerging from this review are those which came into sharper focus through both the liveability indicators and a review of recent community consultation. The 'spotlight' nature of the project and short timeframe has constrained the ability to refine, deepen and articulate implications of findings. As such, further work is recommended to confirm the initiatives proposed.

In proposing the initiatives there has been a focus on:

- **Diversity –** Linking local destinations to positively influences neighbourhood walkability and encourages residents to enjoy physical activity and social connections.
- **Access –** Ensuring a selection of destinations within walkable distance from households facilitates active transport, such as walking, cycling or use of public transport as more viable and makes it easier to reduce car use.
- **Design -** The design of the public realm is important in determining how people reach the destination, how they move and interact with it. as well as how it can enable a strong connection to the community and the environment.
- **Connectivity -** Movement can be enhanced through the provision of safe, connected, convenient, continuous, easily navigated and attractive links.
- **Infrastructure -** The inclusion of safe, functional and highly visible infrastructure encourages a range of travel options.
- **Streetscape Design -** Streets that have been designed to accommodate all transport users encourage more movement.
- **Function -** Open spaces assist in meeting the physical, recreational and social needs of a community.
- **Consultation -** Encouraging both current and future communities to participate in design and development decisions contributes to a sense of place and builds ownership and respect.
- **Composition -** The layout or position of community facilities that enable multiple uses can provide health and socio-economic and economic benefits.
- **Flexibility -** Facilities that can accommodate multiple functions may better serve the community and encourage greater use.
- **Context -** Well-designed buildings can improve health outcomes by engaging with their surrounds.
- **Local Participation -** Combination of hard and soft initiatives with a priority for low capital expenditure and optimum community participation.
- **Choice of Housing –** Ensuring a mix of dwelling types to increase density and attract a broad demographic, creating a resilient neighbourhood that caters for a diverse range of household structures, ages and tenures.

5.3 PRIORITY ACTIONS

HEALTHY CHECK

Connectivity

The way we design and build our neighbourhoods and communities' affects resident's social connections, sense of community and social capital and thus their levels of physical activity and mental health.

- Ensure parks and other areas of public open space provide attractive local destinations for people of all ages to walk and cycle to and be active in.
- Ensure continuity of access within and through adjacent neighbourhoods, and to the wider networks – particularly in less connected, older neighbourhoods of Calista-Medina, Orelia and Parmelia.
- Promote greater physical activity and community interactions by establishing good access along a defined active transport networks of footpaths and cycle ways - connecting the range of uses and destinations such as the Kwinana Recquatic Centre, train station, local schools and surrounding public open spaces.
- Review opportunities to densify neighbourhoods, particularly Wellard, Leda and Wandi, and offer a diverse mix of co-located destinations (including employment, education, retail and recreational uses) to encourage and sustain active modes of transport.

Access

A selection of destinations that are a walkable distance from home makes active transport, such as walking, cycling or use of public transport more viable.

- Ensure community and recreational facilities are well serviced by linked pedestrian and cycle routes, designated crossings, and suitable ramps to encourage regular physical activity and social interaction.
- Within developing neighbourhood areas such as Wellard and Bertram ensure a range of uses that promote physical activity and community interactions.
- Ensure all community members have access to at least one open space within a 400m - 800m walk – enhancing opportunity for walking and cycling as well as mental health benefits and greater social interaction.

SENSE OF PLACE

Personal and Community Safety

The design of the public realm and network of connections are important in determining perceptions of safety, how people reach the destination, as well as how they move and engage within spaces and places.

- Ensure open spaces and supporting infrastructure are well managed and maintained – creating attractive environments and a positive sense of place.
    - How well do nearby buildings and streets overlook the space?
    - Do public spaces provide adequate lighting and safe access after dark?
- Review key destination to ensure public spaces encourage activity and interaction across the community.
    - Does the design encourage people to linger?
    - Do destinations offer shade, seating, secure cycle storage, planting, artwork and the use of high quality materials?
- Ensure the design of spaces and connections put the pedestrian first, and are of a comfortable scale – particularly within the city centre and new local centres.

- Identify opportunities to attract night-time activation, particularly within the city centre – creating vibrant and inviting centres.
- Ensure adequate street lighting and illumination across footpaths, at key entrances to buildings and at bus stops and train stations.

Local Participation

A good sense of place can foster a positive emotional attachment to a neighbourhood and community, levels of interaction between members of the community and formal participation or involvement in neighbourhood and community organisations.

- Ensure community consultation has been employed to determine infrastructure needs, gaps and desires into the future.
- Identify opportunities for the community to be engaged and involved in the design of the public realm, civic spaces and public art.
- Ensure design choices have been informed by the cultural identity of the city and local areas - based on the social, economic, environmental and indigenous histories.
- Identify strategies to encourage a diverse mix of destinations integrated in close proximity to residential dwellings – providing greater opportunity to fulfill daily activities and needs (live, work, play) within existing and newer neighbourhoods.

PUBLIC OPEN SPACE

Function

For children and young families, public spaces and parks provide places to meet and to participate in physical and social play. The provision of public open spaces is thus a key factor in promoting active living and providing important physical, psychological and social health benefits for individuals and the community.

- Consider the roles and functions within public open spaces holistically to resolve needs to cater for a variety of users across the open space network.
- Enhance pedestrian and cycle linkages to public opens spaces – particularly new attractions such as the Adventure Playground in Calista Park.

Quality of spaces

Open space designs that respond to their surrounds can enable a strong connection to the community and the environment.

- Ensure public open spaces and linkages offer attractive environments and quality design outcomes – increasing visitation and physical activity levels.
- Ensure pedestrian and cycle connections most frequently used provide protected and comfortable environments.
- Ensure public spaces respond to existing environmental conditions such as drainage, slopes and retaining trees where appropriate.
- Ensure new development is designed to contribute to street activation and allow natural surveillance of the surrounding community and public spaces.

MOVEMENT NETWORKS

Integration

- Ensure pedestrian and cycle networks optimise access and routes to community spaces and key destinations, such as the city and local centres, railway stations and schools.
- Provide continuity and cohesion of walking, cycling and public transport movement networks across adjacent neighbourhoods – particularly for integrating older neighbourhoods of Calista, Orelia and Medina linkages to the city centre and railway station.
- Encourage greater density around key centres to increase PT number require for regular service routes.
- Ensure good access to regional cycle routes and networks – enabling greater choice of active transport.

Streetscape Design

Streets that have been designed to accommodate all transport users encourage more movement. Movement is enhanced through the provision of safe, connected, convenient, continuous, easily navigated and attractive links.

- Ensure connections to key destinations are well lit, provide clear directions or signage to encourage greater use and accommodate shade and shelter at key stops and destinations.
- Link more than one route between destinations to provide variety in active transport options and experiences.
- Identify opportunities to narrow streets near schools with footpaths becoming wider with crosswalks and pedestrian crossing points connecting movement networks.
- Ensure streets are connected and designed in response to their surrounds – reducing speeds along primary pedestrian and cycle networks, increasing perceptions of safety and comfort.

Infrastructure

The inclusion of safe, functional and highly visible infrastructure encourages a range of travel options.

- Ensure end of trip facilities such as bike racks, drinking fountains, change rooms and lockers, shade/ shelter, seating and lighting are provided within city, local centres and key destinations.
- Ensure facilities are designed for all users including the young, the elderly and those with disabilities.
- Ensure public transport stops are provided within suitable proximity to dwellings and destinations.
- Prioritise walking and cycling as the preferred means of travel within the city centre. Address wait times at traffic lights, the size of footpaths compared to roadway widths and prioritising pedestrian/cycle crossing points.
- Modes of transport will continue to evolved over time. Ensure future transport needs are accommodated in new street design.

COMMUNITY FACILITIES AND KEY DESTINATIONS

Flexibility

Mixed-use planning and the presence of a variety of destinations promotes greater walking and cycling which in turn increases the sense of community or social capital through the facilitation of interaction between residents.

- Within developing areas such as Wellard, ensure community facility are organised to allow for interim uses while the area is established.
- Review community and recreational facilities to ensure these provided offer a range of activities that meet the needs of the community.
- Identify the opportunity for facilities to accommodate multiple functions, better servicing the community and encouraging greater use.

Diversity of Uses

Places for social interaction are critical for creating and maintaining community cohesion and building social capital. An interesting choice of local destinations positively influences neighbourhood walkability and encourages residents to enjoy physical activity and social connections.

- Promote active modes of travel to and from schools – increasing physical levels of activity and fostering perceptions of safety in the area, particularly in Wellard (west) development of a new school on Johnson Road.
- Ensure destinations offer a mix of uses that will encourage consistent attendance and use – within walking distance to homes.
- Identify opportunities where usage can be enhanced through the provision of community and cultural facilities, open spaces or sporting activities.
- Address opportunities for creating 'walkable' and sustainable neighbourhoods by offering key destinations such as employment, education, retail and recreation land uses.
- Design car parking within the city and local centres to reduce unnecessary car travel – with a focus on linking safe, attractive and comfortable pedestrian and cycle pathways as convenient alternatives.

HOUSING DIVERSITY

Choice of housing

A mix of dwelling types can increase density and attract a broad demographic, creating a resilient neighbourhood that caters for a diverse range of household structures, ages and tenures.

- Review policy to ensure new neighbourhoods offer a range of dwelling choices that are suited to the needs and character of the area.
- Identify opportunities within existing neighbourhoods to provide for a diverse community and enable residents to remain within their community across each stage of life.
- Review the strategic locations of affordable housing in close proximity to local amenities such as public transport, employment, shops and schools.

Context

The design of a dwelling can have a positive influence on its surroundings and inhabitants, and can lead to safer and more engaged communities and healthier lifestyles.

- Ensure new dwellings are designed to engage with the street and/or adjacent open space.
- Provide guidance for dwellings to provide passive surveillance by locating active spaces such as living areas and balconies overlooking streets and open spaces.
- Identify opportunities for new dwellings sited on the lot to allow for future intensification.

6.0. Bibliography

ACARA. (2016, August 19). *My School*. Retrieved from My School: http://www.myschool.edu.au/

Australian Bureau of Statistics, A. (2016). *Australian Bureau of Statistics Census Data*. Australian Government.

Australian Centre on Quality of Life, A. (2010, October 4). *Australian Centre on Quality of Life*. Retrieved from Australian Centre on Quality of Life: http://www.acqol.com.au

Australian Curriculum Assessment & Reporting Authority, A. (2015, August). *My School*. Retrieved from My School: www.myschool.edu.au

Australian Early Development Census, A. (2015). *AEDC Community Profile Kwinana*. Australian Government.

Australian Early Development Census, A. (2015). *Data Explorer*. Australian Government.

Catalyse. (2016). *Community Servies and Wellbeing Scorecard*. City of Kwinana.

FYA. (2016, August 10). *FYA*. Retrieved from FYA: http://www.fya.org.au/wp-content/uploads/2016/05/FYA-Election-Platform-FINAL.pdf

Goldfields Land and Sea Council, G. (2016, August). Senior Consultant. (H. Sharley, Interviewer)

Headly, E., & Birrell, B. (2006). *Housing and Community in the Compact City*. AHURI.

Healthy Safe & Inclusive Communities, F. G. (2016, August 10). Review of Kalgoorlie Boulder Liveability & Social Services. (H. Sharley, Interviewer)

Heart Foundation. (2017). *Healthy Active by Design*. Retrieved from Healthy Active by Design: www.healthyactivebydesign.com.au

Multicultural, F. G. (2016, August 11). Cultural Diversity. (H. Sharley, Interviewer)

PHIDU, P. H. (2016). *Social Health Atlas of Australia, Western Australia*. Torrens University Australia.

Profile id, I. (2016). *Our Community Profile*. Profile.id.

RAI, R. A. (2016, August 4). *Insight: Australia's Regional Competative Index*. Retrieved from Australia's Regional Competative Index: http://www.regionalaustralia.org.au/home/tools-and-products/insight/

Regional Australia Institute, R. (2012). *Insight Australia's Regional Competitiveness Index*. Regional Australia Institute.

Regional Development Australia Goldfields Esperance, R. (2015). *Goldfields-Esperance Arts and Culture Framework 2015-2020*. RDAGE.

socialpinpoint. (2016, September 4). *socialpinpoint*. Retrieved from socialpinpoint: https://www.socialpinpoint.com/

Victorian Community Indicators Project, V. (2006, August 2). *Community Indicators Victoria*. Melbourne: Institute of Community Engagement and Policy Alternatives (ICEPA), Victoria University. Retrieved from Community Indicators Victoria: http://www.communityindicators.net.au/

WAPC. (2012). *Household Forecasts - Western Australia Tomorrow, Population Report No.8, 2006-2026*. Perth: WAPC.

WAPC. (2014). *State Planning Strategy 2050*. Perth: WAPC.

Western Australian Police, W. (2016). *Crime Statistics Portal*. Western Australian Police.

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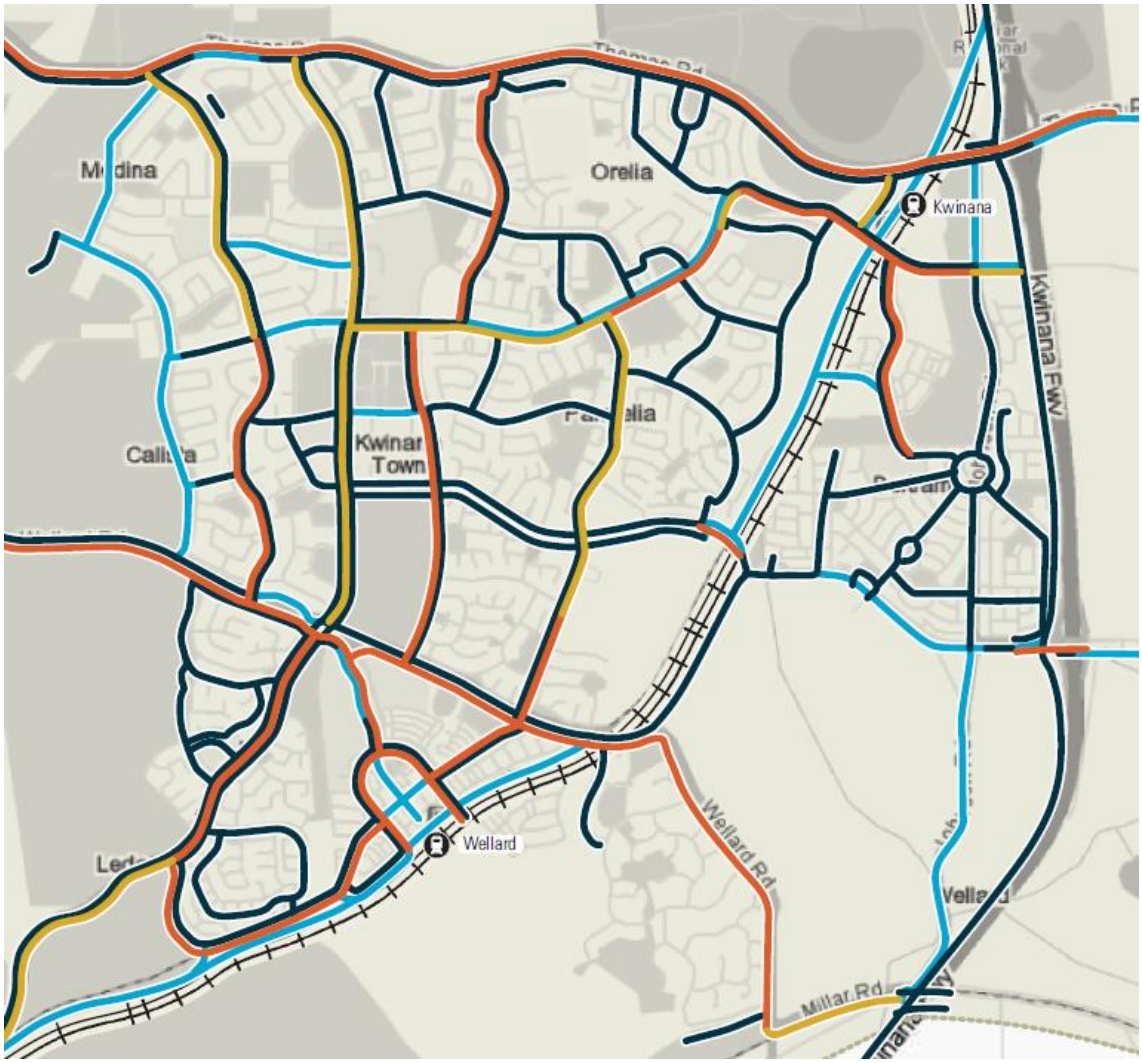
Appendix C

Complete Schedule of 2010 Bike Plan Recommended Projects & Present Status

#	Project	Status	Comment
1	Hope Valley Rd Shared Path	Complete	-
2	Burlington St / McLaren Ave Shared Path	Complete	-
3	Beard St Shared Path	Outstanding	Industrial connections not priority of 2017 plan
4	Mason Dr Shared Path	Not Proceeding	Northern section part of Local Route network
5	Rockingham Rd / Thomas Rd intersection	Under Construction	Project identified in Crowd Spot (27 times)
6	Rockingham Rd Shared Path (Thomas Rd – Mandurah Rd)	Complete	To confirm / standard not to PSP requirement of PTP Plan
7	Patterson Rd / Mandurah Rd intersection	Programmed	Future PSP alignment (ensure standards met)
8	Mandurah Rd Cycle Lanes	Not Proceeding	PSP on freight line preferred option for network
9	Office Rd Cycle Lanes	Not Proceeding	Beach & Ocean recommended route options
10	Thomas Rd Shared Path (at Bingfield Rd E)	Not Proceeding	Consider bike boulevard on Bingfield East
11	Bingfield Rd W, Tucker St, Beacham Cr, Westbrook St Shared Path	Partially Complete	Local Route network
12	Medina Ave Cycle Lanes	Outstanding	Low priority (path or cycle lanes)
13	Calista Ave Path upgrade	Not Proceeding	Focus on secondary route Coleman-Bright
14	Gilmore Ave Cycle Lanes (Thomas Rd – Wellard Rd)	Outstanding	Alternative alignment considered
15	Gilmore Avenue Cycle Lanes (Runnymede Gt - Mandurah Rd)	Complete	-
16	PSP Design Wellard Rd - Rockingham Stn	Outstanding	Continue design and progress alternative route
17	Henley Blvd Shared Path	Complete	-
18	PSP Design Thomas Rd - Freeway PSP	Not Proceeding	Current connection Thomas Rd adequate
19	Thomas Rd / Johnson Rd intersection	Programmed	PSP connection
20	PSP Design Kwinana Stn - Wellard Rd	Outstanding	Developer to construct to PSP standard
21	Bertram Rd Shared Path	Complete	-
22	Johnson Rd Shared Path (Mortimer - Millar)	Complete	-
23	Mortimer Rd Shared Path (Freeway - Barker)	Programmed	Developer to construct (check standard)
24	Parkfield Blvd Shared Path	Complete	-
25	Price Pkwy Shared Path	Complete	-
26	Johnson Rd Shared Path (Sulphur - Thomas)	Programmed	Low priority – developer to construct
27	Holden Cl Shared Path & Cycle Lanes	Not Proceeding	Bike Boulevard (quiet street)
28	Wellard Rd Shared Path (near Calista)	Complete	-
29	Sulphur Rd Cycle Lanes (Durant-Nottingham)	Outstanding	Proposed in 2017 (consider two-way cycle track)
30	Cycle Lane Design Sulphur Rd (Parmelia – Gilmore)	Outstanding	Reconsider project; signage of present treatment
31	Orelia Ave Cycle Lanes (Menli – Thomas)	Outstanding	Consider two-way cycle track
32	Parmelia Ave (Sulphur – Tunnicliffe)	Outstanding	Consider two-way cycle track
33	Wellard Rd Shared Path (Mears – Bertram)	Complete	-
34	Chisham Ave (Gilmore – Meares)	Complete	Crossing points in CrowdSpot

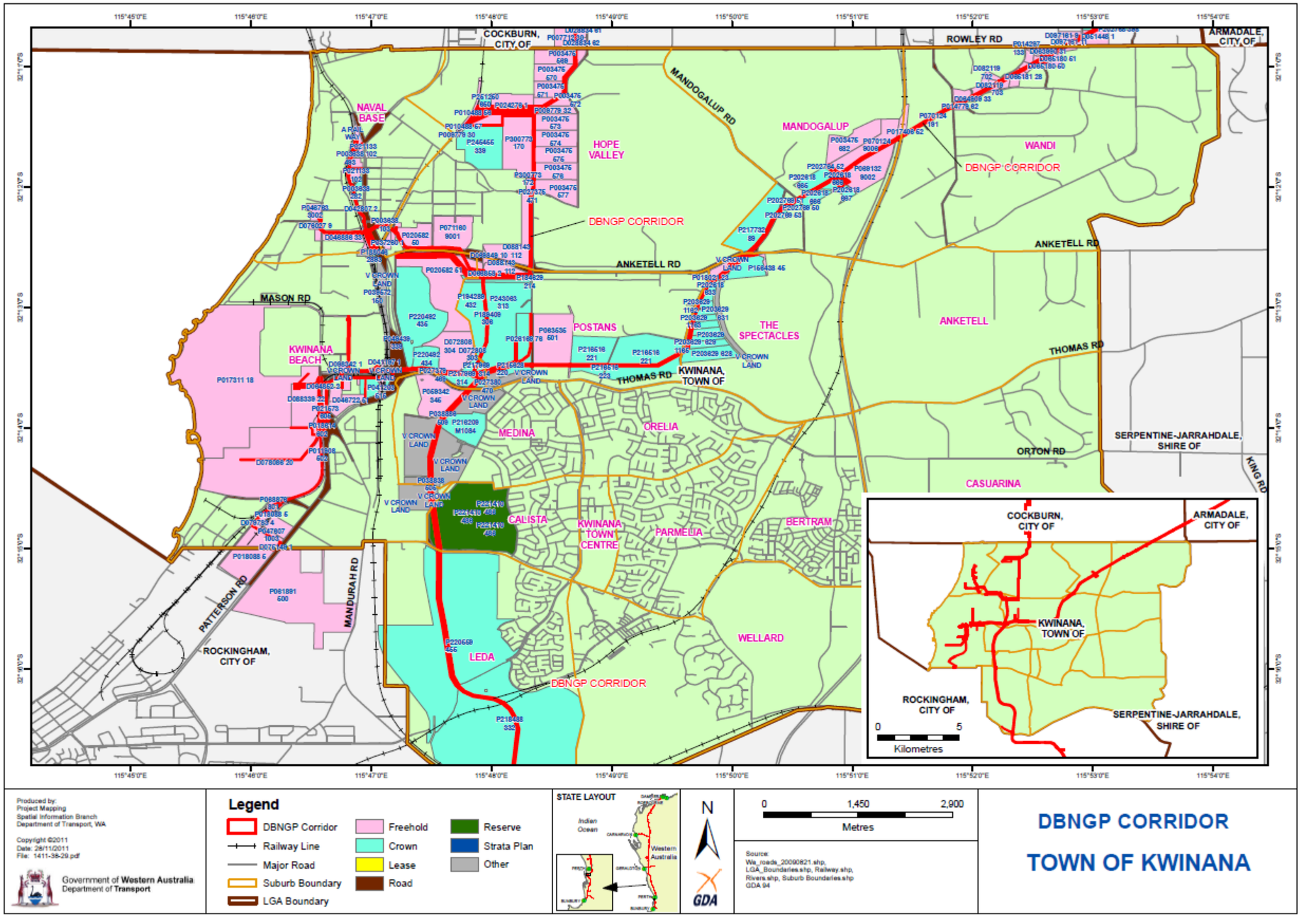
#	Project	Status	Comment
35	Pace Rd Path upgrade (Medina – Gilmore)	Outstanding	Consider bike boulevard
36	Millar Rd Cycle Lanes (Johnson – Wellard)	Complete	-
37	Rockingham Rd / Frederick St intersection	Programmed	Check status with Main Roads
38	Rockingham Rd Cycle Lanes (Cockburn – LG Boundary)	Partially complete	Check location / PSP
39	Rockingham Rd / Beard St intersection	Outstanding	Check status with Main Roads
40	Rockingham Rd / Cockburn Rd intersection	Programmed	Check status with Main Roads
41	Wellard Rd Shared Path (at railway crossing)	Not Proceeding	PSP to progress
42	Armstrong Rd Shared Path	Complete	-
43	Anketell Rd Shared Path	Outstanding	Secondary route (Naval Base to Armadale)

Map of routes proposed in 2010 Bike Plan



Appendix D

Dampier to Bunbury Natural Gas Pipeline Map



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