



# TRAMWAY TRAIL DEVELOPMENT PLAN

South West Corridor Development Foundation Inc.

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Tramway Trail Development Plan  
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# 1.0 INTRODUCTION

## 1.1 PROJECT BACKGROUND

In the early 1920's, a tramway was constructed extending south from the Jandakot Railway Station to Karnup to facilitate the development of the Group Settlement Scheme in the Peel Estate. Timber harvested in the Peel Estate region was transported out, and materials to support the Group Settlement Scheme transported in. However by late 1925, the need for the tramway had passed and the rails were pulled up. An enduring legacy of the tramway is a long, narrow reserve running approximately parallel to, and to the west of the Kwinana Freeway, that remains largely intact to this day. This approximately 32km long reserve transects the Cities of Cockburn, Kwinana and Rockingham and was identified by these Local Government Areas (LGA's) to have great potential as the home for a multi-use trail. Such a trail would run past a variety of natural features including the lakes, wetlands and bushland of the Beeliar Regional Park which features regionally significant lakes such as Yangebup, Kogalup and Thomsons Lakes. A trail following the route of the former tramway would also intersect or have the capacity to readily link with a variety of existing trails along its route, significantly expanding the options for and experiences available to users.

The Tramway Trail project was identified as a priority project by the South West Group's Regional Natural Resource Management (NRM) Strategy (2013). The potential for such a trail was also identified in each of the Cities of Cockburn, Kwinana and Rockingham's Trails Master Plans.

With the assistance of the South West Group, the Cities of Cockburn, Kwinana and Rockingham successfully sought Lotterywest funding to contribute to the cost of a Tramway Trail Development Plan to guide future investment in the Tramway Trail. These three LGA's and the South West Corridor Development Foundation Inc contributed the balance of the funds required, and the South West Group project managed the preparation of the Development Plan. Ecoscape was engaged to prepare the Development Plan.

The following terms listed below are used throughout this report and maps; meanings are provided for clarification:

- Tramway Reserve - tenured land
- Tramway Reserve estimated original route – this term is used where the exact location of the route is uncertain in some areas
- Tramway Trail alignment - specific location of the trail
- Proposed Trail - future planned trail
- The Trail – general term for the Tramway Trail, which can include the Tramway Reserve tenured land, the Tramway Reserve estimated original route and the Tramway Trail alignment.

### Current initiatives

The Cities of Cockburn, Kwinana and Rockingham have agreed to work collaboratively to create a contiguous, regionally significant trail on the Tramway Reserve and to commonly brand and promote the trail. These LGA's have collectively installed multiple coastal and inland trails and have plans to strategically extend their trails network in the future.

The three LGA's have existing Trails Master Plans:

- *Baldivis Tramway Master Plan*, June 2014 by City of Rockingham (this supersedes the *City of Rockingham Trails Master Plan Volume 1 Final Report*, May 2010 by Transplan Pty Ltd)
- *City of Rockingham Trails Master Plan Volume 2 Background and Technical Material Final Report*, May 2010 by Transplan Pty Ltd

- *City of Cockburn Trails Master Plan, 2013* by Transplan Pty Ltd
- *Town of Kwinana Trails Master Plan, June 2006* by Transplan Pty Ltd.
- In addition, the City of Rockingham recently undertook a strategic review of the Trail which aims to apply the City's environmental and social objectives in the development and management of the Trail. The outputs of that review were used to inform this Tramway Trail Development Plan.

The linking of existing sections of trail to form a contiguous Tramway Trail will be a staged process over a number of years recognising the significant cost of construction and/or upgrade and other factors which may influence construction such as multiple land use vesting and tenure (including land in private ownership), possible outcomes of the Environment Protection and Biodiversity Conservation Act Perth-Peel Strategic Assessment which is currently in progress and evolving State Government plans for major transport routes in the corridor.

## 1.2 PROJECT SCOPE

The South West Group required a Development Plan for the Trail that built upon the existing Trails Master Plans for the City of Cockburn, City of Kwinana and City of Rockingham. The purpose of the Development Plan is to guide the establishment of a regionally significant trail and future investment in the Trail.

### Key issues

The South West Group identified a number of issues which needed to be considered and resolved in planning and constructing the remaining sectors of the trail including:

- resolving the routing of the trail through or around private land (including existing extractive industries) and areas of particular conservation value
- facilitating the involvement of agencies and utilities where they border or have management responsibility or ownership of the Tramway Reserve or land through which the trail must link
- identifying those responsible, and gaining agreement for ongoing maintenance of trail infrastructure and surrounds
- planning for the trail to cross major roads, some of which will become more significant in the future
- integrating the trail with planned development on adjacent lands
- identifying opportunities to use development offsets in the construction of the trail
- preventing inappropriate access and use (e.g. motorbikes)
- determining and agreeing on appropriate signage and branding.

## 1.3 STUDY AREA

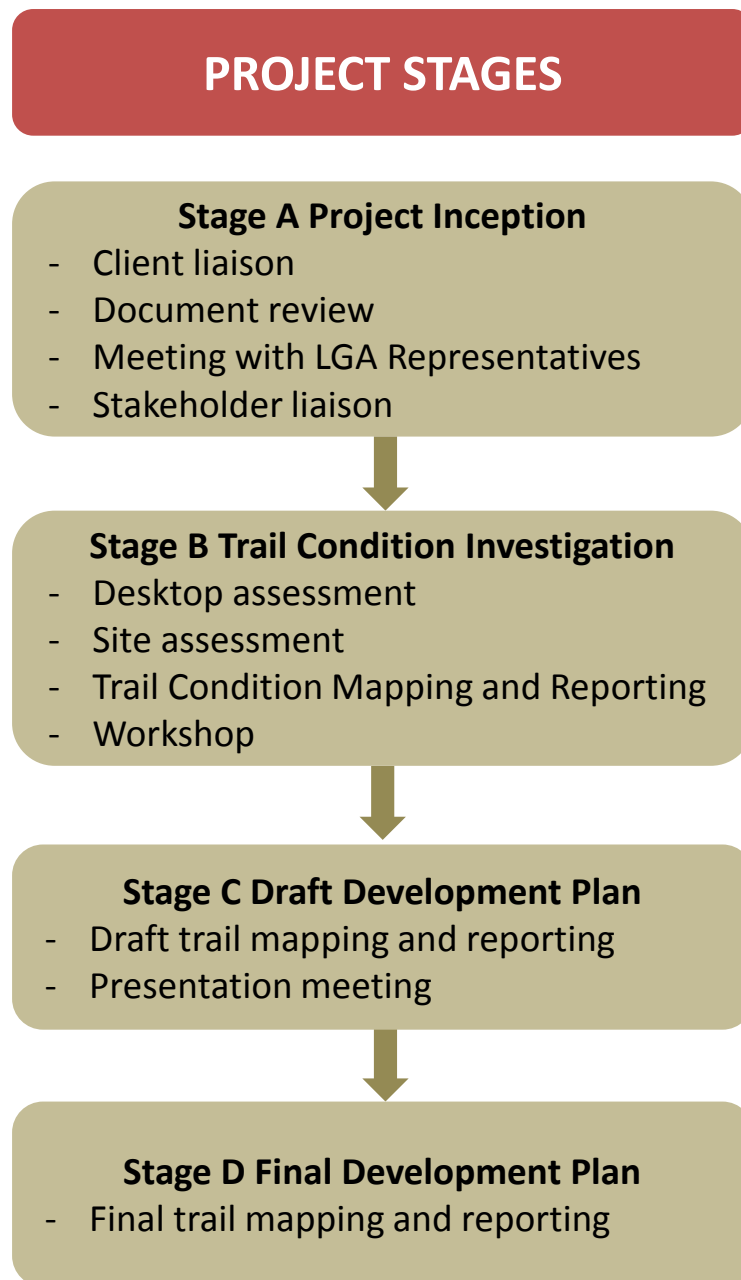
The Trail traverses the City of Cockburn, City of Kwinana and City of Rockingham. It is located about 6-12 kilometres from the coast, roughly following the north-south linear chain of wetlands along the Swan Coastal Plain (**Map 1 in Appendix A**).

The northern head of the Trail starts at Yangebup Lake south of North Lake Road, and then continues past Kogolup Lake and Thomsons Lake. These lakes are part of the Beeliar Regional Park within the City of Cockburn. About six kilometres south of Thomsons Lake the Trail runs past The Spectacles Wetlands which is also part of the Beeliar Regional Park in the City of Kwinana. A further three kilometres south the Trail reaches Bollard Bulrush Swamp, where it runs adjacent to Wellard Road, then crosses Millar Road West and into the City of Rockingham where it runs on the eastern side of Baldivis Road for approximately 13 kilometres until it reaches the southern end at Stakehill Road.



## 1.4 PROJECT STAGES

The project was undertaken according to the stages shown in **Figure 1**.



**Figure 1: Project stages**

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# 2.0 SITE ASSESSMENT

## 2.1 DESKTOP ASSESSMENT

Spatial data was collated in Geographic Information Systems (GIS) and compiled into base maps prior to the site visit to facilitate the assessment of the Tramway Trail; these layers are described below and shown on **Maps 1 – 12** in **Appendix A (Page 51)** and **Appendix B (Page 59)**, plus noted in **Table 1** where the environmental features are intersected by the trail.

### Environment

A description of each of the layers is provided below; these layers are also related to various planning and legislation:

- *RAMSAR sites* (Department of Parks and Wildlife, DPaW 2014) – these wetlands are sites containing representative, rare or unique wetland types or those that are important for conserving biological diversity (The Ramsar Convention on Wetlands 2009).
- *Directory of Important Wetlands* (Department of Sustainability, Environment, Water, Population and Communities, DSEWPac 2008) – wetlands that are included in this directory are those which satisfy one of the six criteria set by the ANZECC (Australian and New Zealand Environment Conservation Council) Wetlands Network (Australian Government 2013).
- *Environmental Protection (Swan Coastal Plain Lakes) Policy* (EPA 2010) - The EPA (1993) identified lakes on the Swan Coastal Plain (SCP) for inclusion into the Environmental Protection (Swan Coastal Plain Lakes) Policy (Environmental Protection Policy, EPP Lakes) 1992 on the basis of having at least 1000 m<sup>2</sup> of standing water in the first week of December 1991. This policy was developed to prevent further loss and degradation of wetlands.
- *Conservation Category Swan Coastal Plain Geomorphic Wetlands* (DPaW 2014) – the wetlands of the SCP have been mapped by Hill et al (1996) and are a defining feature of the SCP. The wetlands have been classified into the following management categories; Conservation, Resource Enhancement or Multiple Use. Conservation wetlands are those which have a high degree of naturalness with a management priority directed towards protecting and enhancing the natural features of the wetland.
- *Bush Forever* (Department of Planning and Infrastructure, DPI 2004) - Bush Forever (BF) sites are regionally significant areas of natural vegetation within the Perth Metropolitan Region. The Western Australian Government, the Western Australian Planning Commission (WAPC), the EPA and other key environmental agencies have endorsed BF and the sites are set aside for protection (WAPC 2000).
- *Environmentally Sensitive Areas (ESA)* (DER 2014) - An ESA defines those areas where priority flora and fauna species, wetlands or Threatened Ecological Communities (TECs) are likely to occur and are therefore subject to strict land clearing regulations.
- *Contaminated Sites Register* (Department of Environmental Regulation, DER 2014) – a contaminated site is one that contains a substance in land or water that is a current or potential risk to human health and/or the environment (DER 2014).

**Table 1** below indicates where the Tramway Reserve estimated original route intersects with the environmental layers which are also shown on **Maps 3 – 7** in **Appendix A**.

**Table 1: Environmental features that intersect with the Trail**

LAYER	SITE	LGA	APPROX. TRAIL LENGTH	LOCATION
RAMSAR	Forrestdale and Thomson Lakes	Cockburn	1.8km	North of Russell Road
Directory of Important Wetlands	Spectacles Swamp	Kwinana	3km	Between Anketell and Thomas Roads
Environmental Protection Policy (EPP) Lakes	Yangebup Lake	Cockburn	375m	Between Osprey and Beeliar Drives
Conservation Category Wetlands (CCW)	Yangebup Lake	Cockburn	145m	South of North Lake Road
	Kogolup Lake	Cockburn	400m	South of Beeliar Drive
	Sumpland	Cockburn	200m	South of Gadd Street
	Spectacles North	Kwinana	154m	South of Anketell Road
Bush Forever (BF) sites	Site 256	Cockburn	115m	Yangebup Lake
	Site 391	Cockburn	5km	Thomsons Lake
	Site 392	Cockburn	1.4km	South of Russell Road
	Site 268	Kwinana	1.3km	North of Anketell Road
	Site 269	Kwinana	8.2km	The Spectacles
	Site 272	Kwinana	4km	South of Thomas Road
	Site 349	Kwinana	570m	North of Millar Road
Site 376	Rockingham	2.7km	East of Baldivis Road between Sixty Eight and Stakehill Roads	
Environmentally Sensitive Areas (ESAs)	Beeliar Regional Park	Cockburn	7.7km	Between North Lake and Wattelup Roads
	BF site 268	Kwinana	1.3km	North of Anketell Road
	Spectacles Swamp & BF site 269	Kwinana	8km	Between Anketell and Thomas Roads
	BF site 272	Kwinana	3.8km	South of Thomas Road
	BF site 349 Site 376	Kwinana Rockingham	600m 2.7km	North of Millar Road East of Baldivis Road between Sixty Eight and Stakehill Roads
Contaminated Sites	Yangebup Lake	Cockburn	840m	Between North Lake and Yangebup Roads

### Landform and vegetation

Churchward and McArthur (1980) have mapped soil landscape systems for the Swan Coastal Plain which are based on soil, landform and vegetation characteristics. Within the vicinity of the study area the systems that occur from the coastline in order eastward are:

- the *Quindalup South System* which is characterised by a series of low relief, shore parallel dune ridges and swales with coastal dune vegetation. Elevation ranges from 5-20 metres above sea level (ASL).
- the *Spearwood System* – characterised by aeolian sand and limestone over sedimentary rocks with Tuart and Marri woodlands. The landscape transitions to more variable and undulating relief with elevation ranging from 5-75 metres ASL
- the *Bassendean System* – characterised by deep sands with semi-wet and wet soils with Banksia and Melaleuca woodlands and mixed heaths. Elevation ranges from 10-25 metres ASL.

- the *Pinjarra* and *Vasse Systems* occur between the Spearwood and Bassendean where there are low lying wetland areas, vegetation includes fringing sedges and variable woodlands of Jarrah, Marri, Flooded Gum, Wandoo, Melaleuca and Banksia. Elevation ranges from 5-20 metres ASL.

The Tramway Reserve estimated original route generally runs along the border of the Spearwood and Bassendean Systems and curves around the low lying areas of the Pinjarra and Vasse Systems. Elevation along the Trail ranges from 10-35 metres ASL, however it is generally between 10-20m ASL (**Map 1 in Appendix A**).

The vegetation of the Swan Coastal Plain has been mapped into broad areas based on soil and landform units (Hedde et al 1980) which enables the description of vegetation types. The Tramway Trail traverses the following vegetation types (**Map 2 in Appendix A**):

- Herdsmen* – this complex is associated with wetland areas and is characterised by sedges and fringing woodlands of Flooded Gum and Melaleuca species
- Bassendean Central and South* – this complex occurs generally inland of the Herdsmen complex and is characterised by Jarrah and Banksia woodlands and in low lying damp areas Melaleuca and sedges
- Karrakatta Central and South* – this complex occurs to the west of the Herdsmen complex and is a narrow strip that is characterised by Tuart, Jarrah, Marri and Banksia woodlands
- Serpentine River* – the trail runs along the western extent of this complex south of Baldivis Road. This complex is characterised by open woodland of Marri, Jarrah and Banksia species with fringing woodland of Flooded Gum and Paperbarks along creek lines.

## Tenure

**Maps 8 – 12 in Appendix B** indicate tenure that most of the Trail traverses ie Freehold/Lease/Other cadastre except within the City of Rockingham where most of the trail aligns with the Baldivis Road reserve (shown as Public Road). Within the City of Cockburn the Trail runs adjacent to the Beeliar Regional Park which is DPaW and City of Cockburn tenure. **Table 2** below lists the approximate length of trail within each type of tenure.

The Trail also traverses a number of Bush Forever Sites. Bush Forever was adopted in 2000 with the aim of retaining regionally significant bushland on the Swan Coastal Plain; these sites amount to 18% of the original vegetation on the SCP. Nearly two thirds of Bush Forever land is under some form of protection, which may include where the sites:

- occur within DPaW reserves
- contain protected wetlands such as EPP Lakes and Conservation Category Wetlands
- contain protected vegetation such as Threatened Ecological Communities (TECs).

The remainder of the sites are unprotected and under various ownership such as government agencies or private owners (Urban Bushland Council WA 2015).

**Table 2: Tenure types that intersect with the Trail**

TENURE	APPROXIMATE TRAIL LENGTH	LGA
DPaW managed land	3.8km 18.5km	Cockburn Kwinana
Bush Forever	5.4km 7.3km 2.5km	Cockburn Kwinana Rockingham
Reserve	5km 2km	Cockburn Kwinana



TENURE	APPROXIMATE TRAIL LENGTH	LGA
Drain Reserve	40m	Kwinana
Unallocated Crown Land (UCL)	45m 3.5km	Cockburn Kwinana
Freehold / Leases / Other	3km 11.5km 16m	Cockburn Kwinana Rockingham
Public Road	200m 4.5km 13km	Cockburn Kwinana Rockingham

## 2.2 ENVIRONMENTAL IMPACT MANAGEMENT

To ensure minimal environmental and cultural impacts the Trail should be designed, managed and maintained in a sustainable manner. Potential environmental impacts may arise from both the construction and ongoing use of the Trail. Impacts from use will also depend on the visitation rates and the activities undertaken on the Trail.

### Trail sustainability

Factors associated with trail sustainability include:

- trail classification
- trail management
- trail stewardship/maintenance
- anticipating how trails change over time
- fire management
- protection and maintenance of environmentally sensitive areas
- provision of safe traffic conditions when trails intersect urban zones
- maintaining a high level of personal safety in both urban and bush locales
- protection of cultural, natural and historical features from vandalism
- establishing defined roles for the community organisations wanting to be involved
- high temperatures during summer and spring
- low heath vegetation and cleared urban areas providing very little shade
- risk of spreading dieback
- very little relief to provide viewing vantage points
- providing guidelines for horse owners and trail users to promote sustainable use eg check horse hooves for seeds and weeds.

The following identifies some of the main environmental impacts that may arise from the construction and use of the trails.

### Trail construction impacts

Some of the major potential impacts on the construction of trails include the following:

- loss of vegetation in forging new alignments
- introduction of dieback (*Phytophthora cinnamomi*) and other diseases through the spread of infected material
- introduction of weeds
- ignition of fires by construction equipment
- destruction of vegetation adjacent to trail alignment
- spillage of contaminants eg hydrocarbons into wetland and waterways

- disturbance and destruction of special fauna habitat areas and threatened flora
- increased erosion.

### Trail use impacts

Some of the environmental impacts that may arise from trail use include:

- introduction of disease via foot, tyre or hoof
- trampling and loss of vegetation adjacent to trails
- introduction of weed species alongside trails
- disturbance to wildlife
- increase potential of fire through arson events
- compaction of tracks especially through horse use
- trenching and incision and potential erosion through pressure from shod horses and mountain bikes
- changes to nutrient system through manure deposition
- track proliferation as a result of unpassable conditions, eg boggy ground or tree falls.

### Ecological linkages

A major impact of land clearing for roads, trails and firebreaks is that remnant vegetation often becomes fragmented, becoming 'islands' of habitat. Movement of flora and fauna is virtually stopped, leading to a gradual decline in sustainability and biodiversity of the remnant vegetation fragments. Ecological corridors, also known as wildlife corridors and greenways, can help limit the effects of fragmentation, by linking nearby areas of remnant vegetation.

Maintenance and preservation of indigenous vegetation along the trail corridor protects an important ecological link in a unique landscape. It is vital that private landowners, local and state governments cooperate to conserve and develop links between remnant areas. There needs to be co-ordination to ensure that any further clearing of land does not degrade or remove existing corridors, and that current corridors along the trail are preserved or enhanced. The development and ongoing maintenance of the Tramway Trail corridor will significantly contribute to preserving critical ecological links.

## 2.3 DISEASE CONTROL

### Dieback management

The construction of a major trail increases the risk of the introduction and spread of dieback during construction and through visitor use. There is a risk that vehicles and pedestrians may contribute to the spread of the disease unless appropriate hygiene practices are introduced as part of the walk trail experience through bushland areas. It is unlikely that any introductions would be deliberate; therefore, education about dieback and appropriate hygiene practices will be essential for visitors unfamiliar with the potential impacts of the disease.

Management initiatives to control the introduction and spread of dieback include:

- dieback information signs at key locations along the trail including signage to notify users of infected areas
- 'Phyto Fighter' boot scrubbing units also at strategic locations along the walk trail, eg, at boundaries of known dieback infested areas where walkers pass from infested to uninfested areas. Initiatives to monitor the use of these uses may include interviews / questionnaire or remote camera monitoring
- use of spray bottles of methylated spirits for cleaning equipment and footwear
- brushing down equipment and footwear
- possible closure of trail during wet conditions.

Knowledge of best practice construction methods to control the spread of dieback must be applied to the construction of the walk Trail, in particular though bushland areas. Consideration of hygiene measures during construction include:

- only working in dry conditions
- ensuring all machinery, vehicles, equipment and footwear entering disease free remnant vegetation is free of soil and mud by wash-down or brushing
- minimising movement of vehicles, machinery, equipment and footwear between disease free and disease infected sites
- not sourcing road making materials (eg. gravel) from infected sites
- working in mini-catchments and not moving material from one catchment to another
- sourcing materials used in revegetation from certified dieback free suppliers
- sealing tracks or installing limestone tracks to limit soil transfer in dieback risk areas.

## 2.4 SITE APPRAISAL AND ANALYSIS

In order to develop a trail concept, the current biophysical, social, economic and cultural context of the site needs to be understood. This helps minimise potential impacts of trail construction on the environmental and cultural values of an area and helps identify interpretive features and narratives. The site condition mapping layers are described below and shown on **Maps 14 - 18** in **Appendix D**.

The successful integration, design and management of trail networks is dependent on the assessment of the following:

- landform including high points and views
- recreation and public access including parks and bushland
- landscape and visual amenity
- indigenous and other cultural heritage
- hazards including major road crossings; identifying safe pedestrian crossing points
- land capability
- form of existing sections of trail including surface materials eg asphalt, concrete, limestone, mulch and sand
- proposed development areas including schools and parks
- vehicle access including minor, secondary and primary roads; parking areas
- railway lines, some of which align with the original Tramway Reserve within the City of Kwinana
- existing trail heads and signage.

Two Ecoscape staff members traversed the Trail from north to south to confirm the findings of the desktop assessment and establish a baseline standard for the Trail to adequately satisfy the intended use. Site condition maps were produced which illustrate the site reconnaissance findings.

To assist in assessing the trail types and site conditions, the Tramway Trail study area was divided into Site Character Types; these are detailed in the section below.

### 2.4.1 Site character types

The Site Character Types of the study area are described to help identify and highlight the particular unique aspects of the landscape the trail passes through and ensure that the broadest experience possible is offered to the user through the conceptual design of the trail. This can also assist in developing interpretation themes, branding and signage, drawing upon the local character types and ensuring visitors get a range of experiences throughout the trail. Refer **Map 13 Site Character Map in Appendix C**.

### 2.4.1.1 Wetlands

This low lying Site Character Type is characterised by open bodies of water fringed with rushes, sedges and fringing woodland of *Eucalyptus rudis* and *Melaleuca* species. Openings in *Banksia* and *Melaleuca* woodlands offer views through to the open water from locations along existing paths and trails.

This character type occurs in two areas along the Tramway Trail; the northern portion is generally from North Lake Road, Yangebup to Rowley Road, Hammond Park, and is part of the Beeliar Regional Park which contains the following sites:

- Bush Forever sites part of the Beeliar Regional Park
- Yangebup Lake, Yangebup: Conservation Category Wetland (CCW)
- Kogolup Lake, Beeliar: CCW
- Thomsons Lake, Beeliar: CCW and RAMSAR Site
- Banganup Lake, Wattleup: CCW.

The southern portion of the Wetland Site Character Type is found from Anketell Road, Mandogalup to Thomas Road, The Spectacles and includes:

- Bush Forever sites within the Beeliar Regional Park
- The Spectacles Wetlands: CCW.



Plate 1 Southern side of Kogolup Lake, Beeliar Regional Park; view from Wedge Road trail





**Plate 2 Northern portion of Kogolup Lake, Beeliar Regional Park; view from Branch Circus**



**Plate 3 View from Wildflower Reserve lookout across Spectacles Wetlands, Beeliar Regional Park**

#### **2.4.1.2 Transitional**

This area is a transitional space, where high intensity agriculture is being developed into a highly urbanised environment. The adjacent vegetation is predominantly *Banksia woodlands*. The northern section occurs from Russell Road, Hammond Park to Rowley Road, Mandogalup.

### 2.4.1.3 Quarries

The Quarries Site Character Type is typically disturbed, open, sandy areas with minimal or no vegetation, although some remnant Tuart and Marri woodlands can be found surrounding the quarries. This area covers Rowley Road, Hammond Park to Norkett Road, Mandogalup and includes:

- Alcoa Sand Quarry, Mandogalup
- Alcoa Tailing Ponds, Mandogalup.

### 2.4.1.4 Farmlands

This character type is characterised by the seasonal bright green, regular planting lines of the small farms located on Norkett Road, Mandogalup to Anketell Road, Mandogalup. Remnant *Tuart* and *Marri* woodlands can be found in road verges.



Plate 4 Remnant vegetation with farm in background on Mandogalup Road

### 2.4.1.5 Urban wetlands

The Urban Wetlands Site Character Type is characterised by *Tuart* and *Marri*, *Banksia* and *Melaleuca* woodlands and mixed heaths. It occurs from Thomas Road, Orelia to Millar Road West, Wellard and includes:

- Bush Forever sites
- Wildflower Reserve, Orelia
- Bollard Bulrush Swamp, Wellard: CCW.





**Plate 5: Water Corporation Peel Main Drain in the Bollard Bulrush Swamp**



**Plate 6: Tramway Reserve between fence lines, adjacent to Wellard Road**

#### **2.4.1.6 Rural / residential**

This area is characterised by low lying flat open spaces and wetland areas fringed with woodland, interspersed with residential development. Vegetation includes fringing sedges and variable woodlands of *Jarrah*, *Marri*, *Flooded Gum*, *Wandoo*, *Melaleuca*, *Tuart* and *Banksia*. The northern section occurs from Millar Road West, Wellard to Safety Bay Road, Baldvis. The southern portion occurs from Furioso Approach, Baldvis to Stakehill Road, Baldvis and includes:

- Karnup Nature Reserve, Baldvis



- Beenyup Pool, Baldivis.



**Plate 7: Baldivis Road**



**Plate 8: Baldivis Road**

#### **2.4.1.7 Completed section**



This area is characterised by suburban development intersected by the Tramway Trails Reserve corridor, which runs parallel to Baldvis Road. Remnant *Tuart*, *Banksia*, *Jarraah*, *Sheoak* and *Marri* woodlands shade the Dual Use Pathway (DUP) and Bridle Trails within the Tramway Reserve. This Site Character Type can be found from Safety Bay Road to Furioso Approach, Baldvis.



**Plate 9: Tramway Reserve Dual Use Path, Baldvis**



**Plate 10: Tramway Reserve Bridle Trail, Baldvis**

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## 3.0 TRAIL CONCEPT

The Trail is envisaged as a central spine running between the north south chain of Swan Coastal Plain wetlands, and the boundary between soil landscape systems and vegetation complexes; refer **Map 2** which indicates the Tramway Reserve aligning with the boundaries between the following Heddlé et al. (1980) vegetation complexes:

- Herdsman and Bassendean in the City of Cockburn
- Karrakatta and Bassendean with pockets of Herdsman in the City of Kwinana
- Karrakatta and Serpentine River in the City of Rockingham.

The Trail will provide recreational and ecological connection between the three LGA's and the various trails within, although confusion for users may arise due to the varied trail surfaces along the Tramway Trail. In order for the trail network to be perceived as a unified whole, and not as a disparate chain of various trails, signage and markers will need to be clear about the Trail alignment. If interpretive material is added to trail heads and signage, there is an opportunity for the unique qualities of different sections of the Trail to be highlighted and expressed, adding to the trail user's experience.

Trail users will experience a variety of environments whilst traversing the Trail, including:

- open, winding, concrete surfaced sections of trail through or adjacent to urban development
- shaded, secluded, limestone surfaced trails through bushland areas
- low lying trails adjacent to wetlands
- asphalt surfaced trails predominantly in the Beeliam Regional Park section, passing lakes and wetlands
- trail to Wildflower Reserve lookout, the highest point on the Tramway Reserve with expansive views to the Spectacles wetlands.

### Trail objectives

The objectives for design of the Trail are to:

- provide a range of experiences for trail users
- create or identify discrete sections of trail that are suitable for end-to-end or out-and-back use by visitors
- connect places of cultural and natural interest
- connect to existing trails, recreation sites and schools
- use existing trails where possible to minimise vegetation clearing and lower construction costs.

The sections of existing and soon to be developed Tramway Trail in the City of Rockingham should set the standard for the future trail corridor development. Particular elements should be replicated where possible including vegetation screening from road, revegetation along the trail, and provision of natural shade.

### 3.1 EXISTING TRAIL INTEGRATION




Approximately 12km of trail has already been constructed in the Tramway Reserve, predominantly in the City of Cockburn and to a lesser extent in the Cities of Kwinana and Rockingham. The trail surface has been dictated by land use and varies from dual-use asphalt or concrete pathway along road reserves, to stabilised limestone paths and firebreaks through bushland. The existing sections of trail have been constructed near areas of special interest or to complement adjacent development, but do not form a continuous trail from north to south.




Wherever possible, the Tramways Trail will be located within bushland, but for significant portions, this is impractical or impossible. The Tramway Trail will link in and connect with a number of other existing and planned trails that branch off or intersect the Tramway Reserve.




The Trail concept is described below in **Table 3** and shown on **Maps 19 – 22** in **Appendix E**.




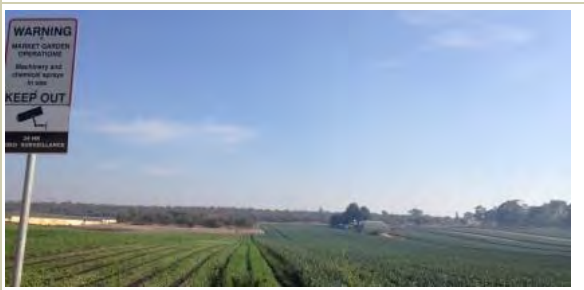
**Table 3: Tramway Trail description**




TRAIL LOCATION	DESCRIPTION	USER EXPERIENCE	EXISTING SURFACE	PROPOSED SURFACE	TRAIL SECTION –REFER MAPS SK05-SK08	IMAGE
<b>City of Cockburn (COC)</b>						
Parkes Street, Yangebup	Existing trail head with Beeliar Regional Park signage, parking area, and links to Yangebup Trail loop Refer Map SK05	Parking for possibly 8+ cars, needs further investigation	Grey asphalt	No change	Section A – Located between parking areas and trail heads with mostly similar trail surface, and includes a trail loop around Yangebup Lake.  Section A begins at Parkes Street trail head, and ends at Emmanuel Catholic College trail head, south of Beeliar Road.	
	Trail leading south to Yangebup Lake	Open, winding trail in low lying wetland areas fringed with <i>Eucalyptus rudis</i> and <i>Melaleuca</i> species woodlands, around large water body	Grey asphalt	No change	Section A	
Tamara Drive, Yangebup	Trails aligns with existing road side concrete path, views to Yangebup Lake	Open, partially shaded, linear trail between natural bush of <i>Banksia</i> and <i>Melaleuca</i> trees and road subdivision edge	Concrete	No change	Section A	



TRAIL LOCATION	DESCRIPTION	USER EXPERIENCE	EXISTING SURFACE	PROPOSED SURFACE	TRAIL SECTION –REFER MAPS SK05-SK08	IMAGE
Tamara Drive, Yangebup	Views to Yangebup Lake along Tamara Drive	Open, linear trail between low lying wetland area and road subdivision edge with views through Banksia and Melaleuca woodlands to open water body	Concrete	No change	Section A	
Emmanuel Catholic College	Proposed trail head Trail proposed west of school oval Refer Map SK05	Trail not yet constructed. Proposed secluded, bush experience through Jarrah, Sheoak and Banksia woodland	Sand	Limestone	End of Section A and beginning of Section B  Section B – Located between major roads (Beeliar Rd and Russel Rd) and between parking areas and trail heads. Offers similar experience to Section A being adjacent to bushland and lakes, with links to many trail loops around lakes. Trail link to Cockburn train station and Cockburn Central with shops and amenities  Section B begins and ends between proposed trail heads with parking areas; one near Emmanuel Catholic College, the other on Mariposa Gardens at Copulup Lake	
Branch Circus	Beeliar Regional Park trails with existing DPaW signage – Proposed car parks and trails head	Secluded, partially shaded trail in bush environment of Banksia and Melaleuca woodlands	Sand	Limestone	Section B	



TRAIL LOCATION	DESCRIPTION	USER EXPERIENCE	EXISTING SURFACE	PROPOSED SURFACE	TRAIL SECTION —REFER MAPS SK05-SK08	IMAGE
Wedge Road trail	Kogolup Lake trail and signage. Tramway Trail to use sand track east of Kogalup Lake, parallel to Branch Circus. Interpretive signage in place.	Winding trail through secluded, partially shaded natural bush environment with sedgelands and fringing woodland of <i>Eucalyptus rudis</i> and <i>Melaleuca</i> species	Sand	Limestone	Section B	
Existing Beelias Park trail	Existing Beelias Park trail east of Thomsons Lake, where it meets Jacksons Promenade	Secluded, partially shaded trail in bush environment	Red asphalt	No change	Section B	
Existing Jacksonia Promenade trail	<p>Proposed trail to align with existing sand track west of Jacksonia Promenade</p> <p>A sealed path exists through the subdivision that broadly follows the desired alignment</p> <p>Includes Copolup Lake Trail head</p> <p>Refer Map SK05</p>	Secluded, partially shaded trail in bush environment	Sand	Limestone	<p>Section B</p> <p>End of Section B at Copolup Lake trail head on Mariposa Gardens. Amenities include public open space with shelters and picnic tables</p>	






TRAIL LOCATION	DESCRIPTION	USER EXPERIENCE	EXISTING SURFACE	PROPOSED SURFACE	TRAIL SECTION –REFER MAPS SK05-SK08	IMAGE
Frankland Avenue	<p>Sandy track west side of Frankland Avenue.</p> <p>Proposed trail to run east of Harry Waring Reserve vermin-proof fence. Shade trees proposed adjacent to trail</p> <p>Refer Map SK05</p>	<p>Open, linear trail with proposed shade trees.</p> <p>Vegetation ranges from woodland of Jarrah, Sheoak, Banksia species to low woodland of Melaleuca species</p>	Sand	Red asphalt	<p>Section C – Located between a major road, Russel Road and the Cockburn/Kwinana Local Government boundary; the trail runs predominantly through or adjacent bushland.</p> <p>Section C begins at Roper Boulevard and ends north of Rowley Road at proposed Frankland Reserve trail head</p>	
Frankland Avenue	<p>Existing market gardens.</p> <p>The extension of Frankland Avenue southward through the market gardens is proposed when development of this area occurs.</p>	Proposed open, linear trail through future urban development	No current trail	<p>To Be Determined (TBD)</p> <p>Surface to be identified in landscape plan following subdivision approval. Recommend Red asphalt surface in keeping with northern sections of the trail.</p>	Section C	




TRAIL LOCATION	DESCRIPTION	USER EXPERIENCE	EXISTING SURFACE	PROPOSED SURFACE	TRAIL SECTION –REFER MAPS SK05-SK08	IMAGE
Wattleup Road, Frankland Reserve	Trail through existing Frankland Reserve	Secluded, shaded trail through Jarrah, Sheoak, Banksia woodland to low woodland of Melaleuca species	Sand	Limestone	Section C	
Rowley Road, Frankland Reserve	Trail through existing Frankland Reserve Includes Frankland Reserve trail head Refer Maps SK05 and SK06	Secluded, shaded trail through Jarrah, Sheoak, Banksia woodland to low woodland of Melaleuca species	Sand	Limestone	End of Section C and beginning of Section D.  Section D trail – located between proposed parking area and trail head, and major road, (Anketell Rd)  Section D begins at proposed parking area and trail head in southeast corner of Frankland Reserve, at Rowley Road	
<b>City of Kwinana (COK)</b>						
Norkett Road, Mandoglaup	Tramway Reserve alignment.  Future limestone trail through Mandoglaup. Tramway alignment within future residential areas will be developed as part of the POS and pathways. Temporary trail proposed east of WA Limestone Sand Quarry; connects with Norkett Road	Proposed trail through residential development; ideally to be vegetated corridor with winding, shaded trail, similar to the City of Rockingham (CoR) Tramway Reserve Trail corridor	Sand	Limestone	Section D	

TRAIL LOCATION	DESCRIPTION	USER EXPERIENCE	EXISTING SURFACE	PROPOSED SURFACE	TRAIL SECTION –REFER MAPS SK05-SK08	IMAGE
Clementi Road	<p>Proposed trail to be located on west side of Clementi Road</p> <p>Includes Clementi Road trail head</p> <p>Refer Map SK06</p>	<p>Linear trail through partially shaded woodland of Jarrah, Sheoak and Banksia species to low woodland of Melaleuca species</p>	Sand	Limestone	End of Section D at proposed Clementi Road trail head near Anketell Road intersection	
The Spectacles Wetlands	<p>Existing limestone trail runs west of wetland.</p> <p>Includes McLaughlin Road trail head and parking</p> <p>Refer Map SK06</p> <p>Image shows view of Spectacles Wetlands from Wildflower Reserve lookout tower</p>	<p>Secluded, shaded, native bush experience alongside low lying wetland areas fringed with <i>Eucalyptus rudis</i> and Melaleuca woodlands. Trails through western area of Spectacles and wind through predominantly low open forest of Tuart, Jarrah, Marri and woodland of Jarrah and Banksia species</p>	Limestone / sand	<p>Sand tracks proposed to be limestone</p>	<p>Section E – Located between existing trail head and parking area, and proposed trail head at Nottingham Parkway, south of Thomas Road; includes loop trails around Spectacles Wetlands.</p> <p>An alternative exists to end Section E at Kwinana Train Station trail head and parking area. The train station is about 800 metres east of Nottingham Parkway.</p>	




TRAIL LOCATION	DESCRIPTION	USER EXPERIENCE	EXISTING SURFACE	PROPOSED SURFACE	TRAIL SECTION –REFER MAPS SK05-SK08	IMAGE
Wildflower Reserve	Trail leads up to lookout tower with view of Spectacles Wetlands	Partially shaded, secluded bushland experience.  Vegetation ranges from Jarrah, Sheoak and Banksia woodland to low woodland of Melaleuca species on lower sites	Concrete / red asphalt	No change	Section F - Located between major roads (Thomas and Bertram Roads), through small areas of bushland in urban environment, includes Kwinana Loop Trail. Trail link to Principal Shared Path (PSP) along freeway  Trail links to Kwinana Train Station and Calico Trail, total distance 350metres.	
Wildflower Reserve lookout tower		Open, expansive views west, north and east from top of tower	Red asphalt	No change	Section F	









TRAIL LOCATION	DESCRIPTION	USER EXPERIENCE	EXISTING SURFACE	PROPOSED SURFACE	TRAIL SECTION –REFER MAPS SK05-SK08	IMAGE
Sicklemore Road	Kwinana Loop Trail signage and markers	Hilly, secluded bush trail experience with some views to the east at high points through Jarrah, Sheoak and Banksia woodland	Limestone	No change	Section F	
Bertram Road	Tramway Reserve runs west of the Bollard Bulrush Swamp  Includes Bertam Rd trail head  Refer Map SK07	Trail to be constructed.  Future, partially shaded, open 'woodland' trail, similar to southern CoR constructed section adjacent to Baldivis Road and residential development	Sand	Concrete	End of Section F and beginning of Section G  Section G – Located between major road (Bertram Road) and existing parking area and proposed trail head, and includes proposed loop trails though and around Bollard Bulrush Swamp  Shaded bush and wetland trail experience  Trail link to Wellard Train Station which is about 1 km from Wellard Road and Homestead Drive intersection.	
Wellard Road	Tramway Reserve runs west of the Bollard Bulrush Swamp.	Trail to be constructed.  Future vegetated, shaded, open trail, similar to southern CoR constructed section adjacent to Baldivis Road and residential development	Sand	Concrete	Trail link to Wellard Train Station. From the start of the trail link the train station is about 900 m to the south west.	

TRAIL LOCATION	DESCRIPTION	USER EXPERIENCE	EXISTING SURFACE	PROPOSED SURFACE	TRAIL SECTION –REFER MAPS SK05-SK08	IMAGE
Cavendish Boulevard	Trail aligns with residential development concrete paths  Includes Cavendish Boulevard trail head  Refer Map SK07	Open, winding, partially shaded	Concrete	No change	End of Section G. Amenities include public open space with shelters, picnic tables and barbecues.	
Wellard Road	Existing sand trail within reserve east of Wellard Road, north of Millar Road West	Trail to be constructed.  Future secluded, shaded, winding pathways, similar to southern CoR constructed section	Sand	Limestone		
<b>City of Rockingham (CoR)</b>						
Millar Road West	Tramway Reserve runs from Millar Road West, angling in towards Baldivis Road  Includes Millar Road West trail head  Refer Map SK07	Trail to be constructed.  Future secluded, shaded, winding pathways, similar to southern constructed section through CoR developed areas	Sand	Reinforced concrete – required by CoR as a firebreak and emergency access.	Section H  Section H – Located between major road (Millar Road West) and existing parking area and proposed trail head at Rockingham Regional Memorial Park  Includes trail loops around Baldivis Nature Reserve and Rockingham Regional Memorial Park	



TRAIL LOCATION	DESCRIPTION	USER EXPERIENCE	EXISTING SURFACE	PROPOSED SURFACE	TRAIL SECTION –REFER MAPS SK05-SK08	IMAGE
Baldivis Road	Tramway Reserve runs adjacent to Baldivis Road	Trail to be constructed.  Future secluded, shaded, winding pathways, similar to southern constructed section	Sand	Reinforced concrete	Section H	
Baldivis Road	Poorly vegetated Tramway Reserve adjacent to Baldivis Road near Zig Zag Road  Includes Baldivis Nature Reserve trail head  Refer Map SK07	Trail to be constructed.  Future secluded, shaded, winding pathways, similar to constructed section south of Safety Bay Road	Sand	Reinforced concrete	Section I – Located between two proposed public open spaces with parking areas and trail heads. Ideally shaded, winding, bushland corridor trail experience.  Includes trail loops around Baldivis Nature Reserve and Rockingham Regional Memorial Park	
Baldivis Road	Tramway Reserve adjacent to Baldivis Road near veterinary clinic north of Safety Bay Road  Includes Safety Bay Road trail head  Refer Map SK07	Trail to be constructed.  Future secluded, shaded, winding pathways, similar to southern constructed section	Sand	Reinforced concrete	Section J - Located between public open space at Baldivis Nature Reserve and major road (Safety Bay Road). Ideally shaded, winding, bushland corridor trail experience.  Includes trail loop to Tamworth Wetlands. Amenities include shops and service station nearby.	

TRAIL LOCATION	DESCRIPTION	USER EXPERIENCE	EXISTING SURFACE	PROPOSED SURFACE	TRAIL SECTION –REFER MAPS SK05-SK08	IMAGE
Stillwater Drive	Tramway Trail adjacent to residential development along Baldivis Road  Includes Stillwater Drive trail head  Refer Map SK08	Secluded, shaded, winding pathways, screened from Baldivis Road	Concrete	No change	Section K – Located between existing parking area and proposed trail head at public open space and where gas easement POS meets Tramway Trail at Baldivis Road (between Serpentine and Sixty-Eight Roads).  Includes loop trail around Stillwater Blvd and Rivergums Blvd, and future gas easement POS loop trail. Amenities include public open space with shelter, picnic tables and barbecues.	
Rivergums Boulevard	Tramway Trail adjacent to residential development along Baldivis Road	Secluded, shaded, winding pathways, screened from Baldivis Road	Concrete Dual Use Path (DUP) and limestone bridle path	No change	Section K	
South of Palomino Parade	Section of Tramway Trail between Palomino Parade and Heritage Park Drive, adjacent to residential development	Secluded, corridor-like experience with urban development on one side, bushland on the other	Concrete	No change	Section K	

TRAIL LOCATION	DESCRIPTION	USER EXPERIENCE	EXISTING SURFACE	PROPOSED SURFACE	TRAIL SECTION –REFER MAPS SK05-SK08	IMAGE
Baldivis Road near Sixty-Eight Road	Vegetated Tramway Reserve adjacent to Baldivis Road north of Sixty-Eight Road  Includes Gas easement POS trail head  Refer Map SK08	Trail to be constructed.  Future secluded, shaded, winding pathways, similar to northern constructed section	Sand	Reinforced concrete DUP plus limestone bridle path adjacent	Section L – Located between proposed gas easement, POS trail head and bushland trail head; includes loop trail though Karnup Nature Reserve. Shelter. Amenities include picnic tables and toilets.	
Baldivis Road / Lugg Road	Don Shepherd Nature Walk within Tramway Reserve, linking to adjacent Karnup Nature Reserve.	Secluded, shaded native bush experience	Mulch	Limestone	Section L	
Baldivis Road / Karnup Road	Karnup Nature Reserve.  Existing trail head with shelters, picnic tables and parking	Secluded, shaded native bush experience	Mulch	Limestone	Section M – Located between Karnup Nature Reserve bush trail head and end of Trail at proposed trail head with parking	
Baldivis Road / Stakehill Road	Vegetated Tramway Reserve adjacent to Baldivis Road near Stakehill Road.  Includes Stakehill Road trail head  Refer Map SK08	Trail to be constructed.  Future secluded, shaded, winding pathways, similar to northern constructed section	Sand	Limestone	End of Section M at proposed Stakehill Road trail head	

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## 3.2 TRAIL CLASSIFICATION

The trail can be classified according to following Australian Standards (AS):

- AS 2156.1-2001 Walking Tracks – Classification and Signage
- AS 2156.2-2001 Walking Tracks – Infrastructure Design.

AS 2156.1 provides designers with a classification system for walking tracks; guidance for the design, fabrication and use of track markers, and the relevant information required by walkers. AS 2156.2 specifies requirements for the structural design of walking track structures, to protect natural and cultural assets and for use as aids to recreation in outdoor areas where the environment is the focus of recreational activities.

It is proposed that the Trail should be based on existing tracks and paths within the general alignment of the original Tramway Reserve where possible. Track proliferation is not likely to be an issue due to the linear nature of the Tramway Reserve and most of the existing trails, but if required, a strategy to control current and further track proliferation is the installation of foot height markers at critical locations to deter the walker and to provide adequate interpretation and signage, informing visitors of the impacts of random tracks.

The proposed Trail alignment may have one or more classifications to cover situations where, between trailheads the conditions may vary, and that section of track would be classified in accordance with the higher classification. Trailheads are defined as urban centres, schools, car parking areas or trail intersections.

The Tramway Trail is predominantly Class 1 throughout its length, with a section of Class 2 through the Wildflower Reserve in City of Kwinana, where the gradient increases up to the lookout tower.

The detailed design phase of the project will require the inclusion of AS 2156.2 and AS 1428.1 as guides for the preparation of the detailed planning and design of the Tramway Trail.

**Table 4** below indicates Trail Classifications 1 and 2 (from Standards Australia).



**Table 4: Trail classification**

TRAIL CLASSIFICATION		
CLASS	1	2
Overview	<p>Opportunity for large numbers of visitors, including those with reduced mobility, to undertake walks which are provided with a high level of interpretation and facilities.</p> <p>Users can expect abundant opportunities to learn about the natural environment through interpretive signs or brochures.</p> <p>Users can expect frequent encounters with others.</p>	<p>Opportunity for large numbers of visitors to walk easily in natural environments which are provided with a moderate to high level of interpretation and facilities.</p> <p>Users can expect to learn about the natural environment with moderate to abundant opportunities to learn through interpretive signs or brochures.</p> <p>Users can expect frequent encounters with others.</p>
Track conditions*	<p>Generally a broad, hard surfaced track suitable for wheelchair use.</p> <p>Width: 1200 mm or more. Well maintained with minimal intrusions.</p>	<p>Generally a modified or hardened surface. Width: 900 mm or more.</p> <p>Well maintained with minimal intrusions.</p>
Gradient*	<p>Grades in accordance with the AS 1428 series. Steps allowed only with alternate ramp access.</p>	<p>Generally no steeper than 1:10. Minimal use of steps.</p>
Signage*	<p>Signs for management and interpretation purposes may be used frequently.</p> <p>Arrow type track markers shall be used at intersections.</p>	<p>Signs for management and interpretation purposes may be used frequently.</p> <p>Arrow type track markers shall be used at intersections.</p>
Infrastructure*	<p>Facilities along the track may include lookout platforms, seats and barrier rails.</p> <p>Camping is generally not allowed along the track.</p>	<p>Facilities along the track may include lookout platforms, seats and barrier rails.</p> <p>Camping is generally not allowed along the track.</p>
Terrain*	<p>Users need no previous experience and are expected to exercise normal care regarding their personal safety.</p>	<p>Users need no previous experience and are expected to exercise normal care regarding their personal safety.</p>
Facilities	<p>Track head facilities will generally include toilets, picnic facilities, car parking, drinking water and information shelters.</p>	<p>Track head facilities will generally include toilets, picnic facilities, car parking, drinking water and information shelters.</p>
Management intervention.	<p>High</p>	<p>Moderate to high.</p>
Risk management	<p>Tracks and adjacent natural and built elements will be inspected and maintained regularly. Inspection interval: 30 days or less.</p>	<p>Tracks and adjacent natural and built elements will be inspected and maintained regularly. Inspection interval: 90 days or less.</p>

\* It is only necessary to meet these requirements to classify a trail

### 3.3 TRAMWAY TRAIL ROAD CROSSINGS

The Tramway Trail crosses a number of roads along its length, several of which are major east-west arterial roads. All road crossings, but especially major road crossings, present a special hazard which must be carefully addressed. Along the proposed Tramway Trail corridor, road crossing treatments will be required at a number of locations.

The development of detailed recommendations and designs for road crossings was not included within the scope of this study, as it was recognised that those sections of the Trail that are yet to be constructed will be constructed in stages as funds become available. This may take many years for some sections of Trail, in which time factors such as traffic volume, road width, pedestrian treatments, sightlines etc may be significantly different to those that exist today. These road crossing will therefore need to be designed at the time of Trail construction.

Main Roads will need to be consulted regarding signage locations and types. Some of the crossings occur on road bends and exact crossing locations will need to be determined in consultation with Main Roads to ensure user safety. It is proposed that signage be installed at approaches to trail crossings, to warn that there is a trail crossing ahead and inform drivers to slow down. Signage could be solar powered flashing lights such as is used at school crossings.

**Table 5** below indicates roads the Trail crosses, plus information regarding road width, median refuges and underpasses. Most of the road crossings have existing pedestrian median refuges, which would need to be upgraded to formalise pedestrian crossings ie with pram ramps, path in the median with pram ramp barrier rail and change in surface material.

**Table 5: Major road crossings – status at June 2015**

NAME	LOCATION	NO. OF LANES	PEDESTRIAN MEDIAN REFUGE	UNDERPASS	ACTION
<b>CITY OF COCKBURN</b>					
Beeliar Drive	near west end of Yangebup Road, Success	4	yes	no	Install signage at approaches to crossing to warn/slow down traffic.
Russell Road	near Frankland Avenue, Hammond Park	4	yes, with formalised pedestrian crossing	no	Install approaches to crossing to warn/slow down traffic.
Frankland Avenue	Just south of Frankland Avenue / Russell Road intersection	2	yes	no	Upgrade median refuge to formal pedestrian crossing.
Wattleup Road	near Frankland Avenue	2	no	no	Install signage at approaches to crossing to warn/slow down traffic.
<b>CITY OF KWINANA</b>					
Rowley Road	at Frankland Avenue	Currently sand track	no	no	When development occurs, install Trail pedestrian crossing.
Mandogolup Road	at Norkett Road	2	no	no	Install signage at approaches to crossing to warn/slow down traffic.
Anketell Road	at Clementi Road intersection, Mandogolup	2	no	no	Install signage at approaches to crossing to warn/slow down traffic.
Thomas Road	approx. half way between McLaughlin and	4, with grade change	yes	no	Upgrade median refuge to formal pedestrian crossing.



NAME	LOCATION	NO. OF LANES	PEDESTRIAN MEDIAN REFUGE	UNDERPASS	ACTION
	Sulphur Roads near Sandringham Park (Nottingham Parkway)				Install signage at approaches to crossing to warn/slow down traffic.
Sulphur Road	at Sicklemore Road intersection	2	yes, with formalised pedestrian crossing	no	Install signage at approaches to crossing to inform drivers of trail crossing ahead.
Bertram Road	near Challenger Avenue intersection, Bertram	4	yes, with formalised pedestrian crossing	no	Install signage at approaches to crossing to warn/slow down traffic.
Freight Railway	at Wellard Road intersection, Wellard	2 rail lines	no	no	Formalise pedestrian crossing / install gates for pedestrian safety.
<b>CITY OF ROCKINGHAM</b>					
Millar Road West	near Wellard Road intersection	2	no	no	Install pedestrian median refuge. Install signage at approaches to crossing to warn/slow down traffic.
Kulija Road	at Baldivis Road	2	yes	no	Upgrade median refuge to formal pedestrian crossing. Install signage at approaches to crossing to warn/slow down traffic.
Safety Bay Road	East side of Baldivis Road intersection  alternate crossing at underpass 400 metre east	4	yes, with formalised pedestrian crossing	Yes, 400m east of Safety Bay Rd/Baldivis Rd intersection	Install signage at approaches to crossing to warn/slow down traffic.
Rivergums Boulevard	near Baldivis Road intersection	2	yes, with formalised pedestrian crossing	no	none
Claret Ash Boulevard	near Baldivis Road intersection	2	yes, with formalised pedestrian crossing	no	none
Palomino Parade	near Baldivis Road intersection	2	yes, with formalised pedestrian crossing	no	none
Furiosio Approach	near Baldivis Road intersection	2	yes	no	Upgrade median refuge to formal pedestrian crossing.
Serpentine Road	near Baldivis Road intersection	2	no	no	Install signage at approaches to crossing to warn/slow down traffic.
Sixty-Eight Road	near Baldivis Road intersection	2	no	no	Install signage at approaches to crossing to warn/slow down traffic.
Karnup Road	near Baldivis Road intersection	2	no	no	Upgrade median refuge to formal pedestrian crossing.  Install signage at approaches to crossing to warn/slow down traffic.

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# 4.0 TRAIL CONSTRUCTION

## 4.1 CONSTRUCTION OF NEW TRAILS

Construction methods vary depending on the trail location, however all trail design should consider material selection, grading, management and maintenance.

The best construction methods and management regimes needed to achieve these objectives are ultimately related to trail shaping techniques and the basic site-specific characteristics that occur at any given location. Creating sustainable walk trails relies on the use of what nature, the site, materials and management can offer, (Parker, 2004). Sustainable construction method and management relies on detailed site planning and design.

## 4.2 USE OF EXISTING TRACKS

The use of existing tracks has appeal to land managers because bushland is preserved and the cost of construction is reduced. Vegetation clearing and associated costs are also minimised when existing tracks are utilised. However, the existing tracks need to be evaluated to determine if their future use for walking and cycling is appropriate. The factors that influence the successful use of existing tracks are width, current use, alignment and overall experience.

### Trail width and materials

There are a number of existing sand tracks through the Tramway Reserve, which are proposed to be upgraded to limestone and/or concrete. The use of tread materials that complement existing tracks within the Tramway Reserve will reflect the local landscape character, enhance the natural experience, and reduce the visual impact of the trail. It is recommended:

- where existing adjacent trail surfaces are asphalt and concrete, the new trail sections also match the materials for consistency. Refer to **Table 3** for more details on particular sections and proposed materials
- to use locally sourced limestone to upgrade the sand track adjacent to Clementi Road, as advised by the City of Kwinana
- to install reinforced concrete paths adjacent to proposed developments for emergency and maintenance access
- change mulch paths through Bush Forever sites to locally sourced crushed limestone
- compacted limestone is used for trails in bushland.

Existing and proposed trail surface materials, and existing trails which the Tramway Trail can align with are shown in the **Trails Concept Maps SK05-08** in **Appendix E**. **Table 6** below indicates the trails which the Tramway Trail will intersect or can link to, including loop trails; these are also shown in **Maps SK05-08** in **Appendix E**.

**Table 6: Existing trails**

CITY OF COCKBURN		
	Surface and width	Use
<b>Beeliar Regional Park Trails:</b>		
Yangebup Lake Trails	2.4m wide asphalt / concrete	dual use
Kogolup Lake Trails	sand	pedestrian
Thomsons Lake Trails	sand	pedestrian
CITY OF KWINANA		
	Surface and width	Use
The Spectacles Wetlands Trails	limestone / sand	dual use mountain bikes
Wildflower Reserve Walk and Lookout Tower - includes Trail link to Kwinana Train Station	2.4m wide asphalt / concrete	pedestrian
Tramway Nature Trail (part of Kwinana Loop Trail, Sicklemore Rd)	2m wide crushed limestone	pedestrian mountain bikes
Bollard Bulrush Swamp (along Peel Main Drain)	grass / sand	pedestrian mountain bikes
Kwinana Freeway Principal Shared Path	2.4m wide asphalt	dual use
Calico Trail - includes Trail link to Wellard Train Station	2.4m wide asphalt / concrete	pedestrian
CITY OF ROCKINGHAM		
	Surface and width	Use
Tamworth Hill Swamp trail	Sand / limestone	pedestrian mountain bikes
Tramway Reserve Trails	2.4m wide concrete	dual use
Tramway Reserve Bridle Trail	2.4m wide limestone	horses
Parmelia Gas Pipeline Corridor	asphalt / concrete	dual use
Karnup Nature Reserve Trail (Don Shepherd Nature Walk)	2 - 3m wide mulch	pedestrian
Baldivis Nature Reserve Trail	2m wide limestone	dual use

### 4.3 COSTS, PRIORITY AND RESPONSIBILITIES

Broad trail construction costs have been itemised into a **Table 7**. Trail implementation priority is listed below:

- Priority 1: to be implemented as soon as possible to link disconnected sections of trail;
  - o to make large usable lengths of trail, predominantly within the City of Cockburn due to the high number of existing, constructed trails; also includes section of trail within the City of Rockingham to create a continuous link with well-development trail
  - o increase community awareness eg where the trail passes near schools, community centres etc
- Priority 2: link together large gaps in the trails eg predominantly through the City of Kwinana
- Priority 3: proposed trails constructed when development occurs eg City of Rockingham and areas within City of Kwinana.
- Priority 4: proposed trails constructed when development occurs in the City of Rockingham, and where the trail crosses major roads.

See **Appendix F** for detailed Trail construction costs.

**Table 7: Trail construction priority and cost**

<b>City of Cockburn (CoC)</b>			
<b>Trail Section</b>	<b>Priority</b>	<b>Trail alignment options</b>	<b>Cost - refer Appendix F for detailed cost breakdown</b>
A	Priority 1: - create links between well-established, numerous existing trails - construct trail heads for user orientation and safety	No options	\$71,382
B	Priority 1: - create links between well-established, numerous existing trails - construct trail heads for user orientation and safety	The southern portion of Section B can use the existing concrete path along Jacksonia Promenade whilst the sand track in the Thomson's Lake reserve is being upgraded to a limestone trail	\$188,268
Section between B and C	Priority 1: - create a completely linked trail for the northern section of Trail	No options	\$46,009
C	Priority 1: - create link between well-established, numerous existing trails north of Frankland Avenue and COK trails - construct trail heads for user orientation and safety	A temporary trail to be constructed through subdivision and Frankland Reserve until the road extension through the market gardens is completed	\$295,877
<b>City of Kwinana (CoK)</b>			
<b>Trail Section</b>	<b>Priority</b>	<b>Trail alignment options</b>	<b>Cost - refer Appendix F for detailed cost breakdown</b>
D	Priority 2: - create link between large trail gap between CoC trail to the north and The Spectacles Wetlands trails - construct trail heads for user orientation and safety	A temporary trail could be constructed east of WA Limestone Sand Quarry, linking to Norkett Road until Mandogalup West development is completed	\$343,823
Section between D and E	Priority 4: - construct trail link across Russell Road to link trail Sections D and E	No options	\$18,414
E	Priority 2: - create link and trail loops with existing Spectacle Wetlands trails. - construct trail heads for user orientation and safety	Numerous sand tracks and limestone trails around wetland.	\$93,966



F	Priority 2: - create link between Spectacles Wetlands trails and Wildflower Reserve lookout for user amenity - construct trail heads for user orientation and safety	Most of Section F utilises existing trail/path surfaces, except where proposed Trail is adjacent the railway line from near Sicklemore Road to Challenger Avenue	\$178,486
G	Priority 2: - create link and trail loops with existing Bollard Bulrush Swamp trails and link to future Wellard Road development - construct trail heads for user orientation and safety	No options	\$493,960
Section between G and H	Priority 4: - construct trail link across freight railway to link trail Sections G and H	No options	\$45,423
<b>City of Rockingham (CoR)</b>			
<b>Trail Section</b>	<b>Priority</b>	<b>Trail alignment options</b>	<b>Cost - refer Appendix F for detailed cost breakdown</b>
H	Priority 4: - trail to be constructed in Tramway Reserve corridor when adjacent development occurs	No options	\$358,421
I	Priority 4: - trail to be constructed in Tramway Reserve corridor when adjacent development occurs	No options	\$421,025
J	Priority 3: - trail to be constructed in Tramway Reserve corridor when adjacent development occurs - create trail link to Tamworth Wetlands - construct trail heads for user orientation and safety	Portions of Section J could use existing Baldivis Road concrete path, although this is not continuous	\$508,236
Section between J and K	Priority 4: - construct trail link across Safety Bay Road to link trail Sections J and K	No options	\$47,720
K	Priority 1: - most of Section K already utilises existing trails through Tramway Reserve - proposed trail head at Stillwater Drive in public open space with shelters and picnic areas - create link to existing trail through developed area - construct trail heads for user orientation and safety	No options	\$300,415

L	Priority 3: - trail link between northern completed trail section and existing parking area at Karnup Nature Reserve - create different trail user experience through bushland areas in comparison to trail through Tramway Reserve corridor in urban development	No options	\$386,775
M	Priority 4: - trail link to southern end of Trail	No options	\$81,600

## Maintenance

Monitoring the Trail condition, foreseeing maintenance issues early, and undertaking remediation measures, is important for the long term sustainability of the Trail. Maintenance includes activities such as:

- vegetation pruning
- erosion control
- monitoring of path and facility conditions; recommended monitoring frequency is six monthly for all trails.

## Future trail routes

The Trail Concept Maps show a number of 'future trail routes'. These are possible routes along a preferred alignment, but for various reasons due to current land use, or accessibility, a temporary trail is recommended to be constructed, until the preferred trail alignment can be implemented. These are located at:

- Frankland Avenue extension to Wattleup Road and Rowley Road, City of Cockburn
- Mandogalup West development, City of Kwinana
- Sulphur Road to Challenger Avenue embankment adjacent rail line, City of Kwinana.

There may be opportunities in the future for sections of the route to be used for light rail. This could use renewable energy technologies and be an easy, fast rail service taking users between train stations, recreation spaces, bushland areas and other areas of interest.

## Responsibility

The Trail alignment predominantly runs within various reserves or is contained within its own land title and therefore the implementation costs will be borne by the relevant LGA. Where the proposed Trail runs through development sites on private land, liaison with the developer will need to occur to set up trail development as part of Public Open Space (POS) development. Developers could contribute to the Trail cost, for example through the Mandogalup, Belgravia, Lot 661 Bertram Road developments, plus the various developments in the City of Rockingham. The ideal trail is one within a wide vegetated corridor, and there is opportunity to ensure such a trail is included in future developments, by including the alignment within local planning policies.

As a result of the master planning process it is recommended the Cities of Cockburn, Kwinana, and Rockingham form a management committee.

This committee will be recommended to undertake a number of key tasks in the development of the Trail, some of these include:

- implementation of the Trail Development Plan
- preparation of funding applications
- oversee the detailed design phase of the Trail Development Plan
- clarification of roles and responsibilities of each LGA
- oversee the preparation of trail management strategies and policies where appropriate including:
  - Risk Management Strategy
  - Fire and Emergency Access Management Strategy
  - Promotion, Interpretation and Signage Strategy
  - Revegetation Strategy
  - Weed and Feral Animal Management Strategy
  - Trail Monitoring and Maintenance Strategy.

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# 5.0 BRANDING, MARKETING, FUNDING & RISK

## 5.1 SIGNAGE AND BRANDING

The Trail strategies and marketing are described below and shown on **Maps 23-24** in **Appendix G** and **Appendix H**.

Information about the trail system such as interpretive brochures and maps should be available in urban areas, accommodation places, wineries, art galleries, shops and on the internet.

### Signage

Signage should be subtle and uniform throughout. It is recommended a sign strategy is developed to identify appropriate use of signage, information, style, hierarchy, materials, and maintenance requirements.

To achieve the vision of the Trail Development Plan it is important that the natural beauty of the region is not devalued by a proliferation of signage. There are three types of signage required for trails:

- directional
- regulatory
- interpretation.

Directional and safety signage is required to meet relevant Australian Standards and inform the user of trail information in accordance with AS 2156.1 Walking Tracks: Part 1 Classification and signage. Other information which may be beneficial for this trails network could include the general seasonal condition of the track and the potential for fire within the region.

### Signage design

The project team met with representatives from DPaW to ensure signage standards are adhered to. Outcomes of the meeting are shown below.

Trail heads to include:

- name of trail
- large overall map of trail
- map of local smaller section of trail
- information on what to expect on the trail:
  - distance
  - level of difficulty ie the trail classification
  - estimated time to walk the section
  - surface of trail
  - safety measures.

Standard trail head sign:

- 800wide x 600 tall or 900 wide x 1200 tall
- $\frac{1}{3}$  text:
  - no more than 250 words for interpretation sign
  - 150-180 words for trail head sign
- $\frac{1}{3}$  space
- $\frac{1}{3}$  graphic including large map and logos
- Aluminium
- 75mm letter height for walking trail (under 15kms /hour).



**Directional markers:**

- to direct users to facilities such as:
  - o toilets
  - o water
  - o food
  - o loop trails
  - o change in trail direction
- ‘Easy Drive posts’ – these are predrilled and hold the 95x95mm symbols or directional markers
- walking trails with boot symbol and cycle trails with wheel symbol
- can add logo to directional marker but not advised
- use international symbols for markers
- lighter background with darker vinyl cut lettering
- apply anti-graffiti coating
- 1.6mm marine grade aluminium
- reflective background for night time.

**Cycle trails:**

- directional markers need to be at head height.

**Logo design considerations:**

- can the logo easily convert to a line drawing
- can the logo convert to a monochrome colour scheme
- can the logo be stencil cut out easily
- the logo can go inside the directional marker ‘outline’ but not recommended.

**Interpretive signage:**

- full colour digital print onto white printable vinyl then sprayed with an anti-graffiti clear coat.

**Interpretation**

Interpretation of the biophysical and socio-cultural characteristics of the region promotes appreciation and stewardship of landscape values unique to the region. Interpretation provides an opportunity to cater to a range of audiences, through a range of media such as themed events, digital media, and education programs.

Interpretation can be developed in a number of ways eg integrated with signage, artworks, or hardscape areas such as pathways. The City of Rockingham has expressed a preference for small directional plaques along the pathways, whilst locating all interpretation signage at key feature nodes and trail heads.

The design, location and content of interpretive signage requires further investigation and planning. Engagement of a suitable consultant is recommended during or before the trail construction begins.

**Branding**

Branding the Trail will encourage recognition of the trail by visitors and trail users, making the trail instantly identifiable by consistency in brand representation.

**Branding imperatives:**

- It is important for users to recognise that this is a regional trail therefore the branding will need to reflect this.
- Branding should be inspired by the Tramways historical reference, reflecting the original use of this corridor.

- The brand should encompass and be relevant to the recreational uses of the Trail.
- The brand should be readily adaptable to not only signage, but for printed materials such as brochures and digital applications.
- Local colours and native natural bush elements are possibilities for brand inspiration.

#### Brand deliverables:

- Full suite of Trail brand logos in CMYK, RGB, Pantone & Mono colour for all necessary applications.
- Branding colour scheme, particularly for signage, but adaptable across all platforms.
- Comprehensive Trail “brand guidelines” for all future brand uses; signage, print & digital. Should also include options for sponsorship co-branding.
- *Optional:*
  - Promotional posters.
  - Trail maps.
  - Brand launch: could include opening of the trail by local government, initial promotional trail race or event, interpretive historical walking tour, and/or community involvement event such as a planting day.

Branding smaller sections of the Trail will also offer opportunities for sponsorship of specific trail alignments to assist in the implementation and maintenance of the trails network.

#### Deliverables Budget:

- Brand design & brand guidelines: approximately \$2500-\$3500.
- Promotional Posters A3, Quantity 200: approximately \$250.
- Trail Maps, Folded A3 to A6, Full Colour, Quantity 500: approximately \$500-\$700.
- Brand Launch: Price depends on scope and size of brand launch.

See also **Appendix F** for signage, interpretation and branding consultant costs.

## 5.2 MARKETING

The interpretation of the region and the trail location are inextricably linked, so is the medium by which the interpretation is delivered in order to maximise the trail user’s experience. The following are ideas for interpretation media and potential marketing.

- Applications (App):
  - *Trails WA* App; DPaW intend for all trails to be included in this App. This app is currently in development and will potentially have an online trail map, historical references, flora & fauna information & event information, specific to Western Australia.
  - *Every Trail Guide* App. A worldwide database of trail maps that allows for downloadable and interactive trail maps as well as reviews and photos contributed by users.
  - *Explore Parks WA* alerts and Facebook page. A uniquely Western Australian Parks guide that allows for comprehensive trail description, events, activities, flora & fauna information, reviews and media uploads. The Facebook page allows for current users and potential visitors to interact.
  - *Map My Walk*. Allows trail seekers and users to interact and swap information about trails, particularly focused around the physical exercise element of trails. Purports to allow users to “plan, track, study and share” their trail journeys, can be useful for organised walking groups.
- Check ‘Friends of’ groups for Apps the Tramway Trail can join eg:
  - Friends of the Spectacles Wetlands
  - Friends of the Cockburn Wetlands Education Centre.

- Create social media “contact points” for the trail in the digital realm:
  - Hashtags for Twitter (#TramwayTrail, etc.)
  - Facebook / Instagram presence for user generated content (particularly photos)
  - Google + page for user reviews/recommendations
  - Social media sites can be monitored for references to the trail.
- Trail profiles created for online directory and tourist websites (ie. TripAdvisor, What's On Perth, Google Maps). This improves web presence and searchability (Search Engine Optimisation).
- Podcast:
  - interpretation material downloaded onto MP3 (Moving Picture Experts Group) players, available via a Compact Disc (CD) or the Trails website. This may include Aboriginal and European cultural stories, environmental characteristics and survival techniques.
- Quick Response (QR) Codes on signage:
  - need App on phone to access information
  - DPaW has found that QR Codes often experience technical difficulties such as poor connections, and websites not being updated.
- Trigger Points:
  - users download an App prior to using the trail
  - trigger points are fixed to signage
  - users receive a text with trail information as they pass by the trigger point.
- Interpretation can change depending on the season through the addition of season-relevant information, for example plants that flower during certain periods, fauna movements during certain times of the year, and times when bush tucker is fruiting.
- The integration of a “welcome to country” place within each LGA for ceremonies, song, meditation and connection to country interpretation.
- In sensitive sites, mystery and/or night tours can be provided by a guide.
- Boutique industries (producing and selling), in public open space areas adjacent the Trail
  - eg bush tucker, bush cosmetics, bush medicine, books, artworks, West Australian produce.
- Trails are to be progressive so that visitors can add to their experience of the trail network over time, via many of the suggestions listed in this section.
- Discrete sections of trails are marketable products to gain corporate funding.
- The tours and trails are ranked or graded for the abilities and time allowances of a wide range of visitors.
- Bird hides and binoculars are provided in sensitive areas.
- Put counters on trails to gather data for future or continued funding:
  - monitor change in numbers before and after marketing
  - approach high schools and universities for volunteers as part of research
  - approach volunteer groups such as Rotary Clubs
  - organise counting on one weekday plus one weekend day, to get a cross section of the public eg Friday and Saturday.
- Events:
  - Due to pedestrians requiring crossing at major intersections along the Tramway Trail, organised events will require careful planning to ensure user safety. Train stations could be used as car drop-off areas and event starting points, then users would commute via train back to car parking area eg between Cockburn, Kwinana and Wellard Stations.

### Trail name

The trail name should be a strong ‘hook’. There are no trails in Western Australia which have the same trail name, although three pass through, follow or cross disused tramways, see list below.

- One Mile Jetty Trail at Tramway Bridge, Carnarvon
- 10 Mile Brook Trail follows old tramway, Margaret River
- The Cascades, a loop trail which crosses the Northcliffe tramway, Pemberton.

There is also one tramway trail in Hobart, the Lake Margaret Tramway Trail. As there are no trails in WA named 'Tramway Trail', it is recommended that the trail be named the 'Tramway Trail'.

Also, sections of the trail could be named differently ie 'sub-name' to identify a trail portion particularly relating to a certain experience eg wetlands. Refer to the **Trails Concept Maps SK05-08** in **Appendix E** for trail sections.

### 5.3 FUNDING

A number of funding opportunities are available to assist in the development of community based projects such as trail development. Funding and support is available from various levels of the Government, and community-government programs including Green Corps and community volunteer groups.

#### Funding programs

This report has sourced a number of state and federal funding programs currently available for the development of trails within Western Australia. Refer **Appendix I** for more details. They include:

- Trailswest (Department of Sport and Recreation) –Lotterywest Funding
- Interpretation of Cultural Heritage - Lotterywest
- Indigenous Heritage Program
- Perth Bicycle Network
- National Trust (Western Australia)
- Corporate sponsors
- Property developers.

### 5.4 RISK MANAGEMENT

Managing risk is an essential component of trail planning. Consideration needs to be given to the environment (dieback disease, erosion, fire etc), wilderness values and visitor health and safety and evacuation. Risk needs to be considered during the construction and operational phases of the trail development. A basic risk assessment process has been undertaken in accordance with AS/NZS ISO 31000:2009 Risk management - principle and guidelines. **Table 8** below indicates the Risk assessment prepared for both environmental and visitor risk.



**Table 8: Trail risk assessment**

ENVIRONMENTAL RISK							
Hazard	Likelihood	Causes	Risks	Consequence	Existing controls	Rating	Action
Introduction of dieback to the trail, new infestations or spreading previous dieback with access or trail building activities.	Possible	Moving soil, obtaining gravel or limestone from dieback infested pit, introduction from vehicles, dieback infected water used in operations.	Vegetation death, loss of habitat, ecosystem modification.	Major	Management Plans, example Hygiene Plans, Environmental Impact Assessment Checklist (process), Gravel Management guidelines, wash down and Boot stations, cleaning agents such as 'Phytoclean',	High	Environmental Management Plans, Induction Training, On-site Environment Officer.
Introduction of dieback, new infestations, beyond the baseline assessment due to ongoing usage and management of trails.	Possible	Inadequate management of subsequent visitation and recreational use	Vegetation death, loss of habitat, ecosystem modification.	Major	Management Plan, boot stations, hygiene access protocol (road closures)	High	Increase awareness of the bushland areas sensitivity to dieback through new website information, linked camping permits, public advertising promotion, tourism centres, develop new slogan.
Introduction of weeds due to road and track building activities.	Possible	Transport of weeds into the bushland areas	Unwanted infestations of exotic plants and threat to native species	Major	Existing Environmental Plans.	High	Environmental Management Plans, Induction Training and On-site Environment Officer.
Increased erosion along trail alignment after construction.	Possible	Increased hard surfaces, concentration of flows (speed and volume)	Channelling water will result in soil movement	Moderate	Road Infrastructure (culverts, spoon drains)	Low	Environmental Management Plans, proper trail design and location in durable soils.
Destruction of Conservation Significant Flora	Possible	Direct disturbance of flora by trampling or vehicle, oil spill, inadequate water management, direct displacement of Declared Rare Flora (DRF)	Without adequate surveys prior to construction Conservation Significant Flora will not be identified	Major	Known locations on DPaW database. Knowledge of DPaW and LGA Environmental Officers.	Medium	Environmental Management Plans & Flora surveys prior to works.
Impact on Aboriginal Heritage sites	Rare	Road plant or vehicle enters aboriginal site or subsequent recreational use impacts on aboriginal sites		Major	Aboriginal heritage act and on site consultation / sign off by relevant Land and Sea Council	High	Cultural Management Plans.
Weather conditions that lead to work stoppages	Unlikely	Poor weather conditions eg rain, high winds, hot days		Rare	Rain events stop machine works.	Low	Management
Wildfire in the area of works leading to work stoppages	Possible	Increased equipment usage in park causing increased fire risks, or natural causes (eg lightning strikes).		Rare	nil	High	
The project will cause fauna populations to be disrupted, injured or killed.		Increased human usage within the bushland areas from pre-construction and construction of		Fauna will be relocated, injured or killed.	Existing Environmental Management Plans. DPaW and LGA Environmental	High	Fauna Management Plans

		the road, recreation sites and walk trail.			officers' knowledge.		
VISITOR RISK							
Hazard	Likelihood	Risks	Consequence	Rating	Action		
FIRE							
Spring	Rare	injuries / burns	Moderate	Moderate	develop a risk management plan which includes prediction of extreme weather patterns, walker registration, track closure during high risk periods, evacuation plan and medical treatment plan.		
Summer	Rare	death/ severe burns/ other injuries / people trapped	Catastrophic	High	develop a risk management plan which includes prediction of extreme weather patterns, walker registration, track closure during high risk periods, evacuation plan and medical treatment plan.		
Autumn	Rare	death/ severe burns/ other injuries / people trapped	Catastrophic	Moderate	develop a risk management plan which includes prediction of extreme weather patterns, walker registration, track closure during high risk periods, evacuation plan and medical treatment plan.		
Winter	Rare	minor injuries	Minor	Low	develop a risk management plan which includes prediction of extreme weather patterns, walker registration, track closure during high risk periods, evacuation plan and medical treatment plan.		
SAFETY AND RECOVERY							
Trail users hit by vehicles at road crossings	Likely	Injury, death	Major	High	Install road median refuges at major road crossing, signage		
Lack of water	Possible	dehydration / heat stroke / death	Major	High	develop a water supply plan which includes monitoring of water availability and water security; investigate water supply options including walker registration, drop points, water collection from infrastructure.		
Getting lost	Unlikely	dehydration, panic, injury	Major	Moderate	good signage, good maintenance regime, visitor registration, high quality maps and guidebooks, gps alignment publicly available		
Injury / accident / illness	Possible	animal bites, allergies, diarrhoea, heart attack, panic attack, flu, broken limbs, severe sprains, burns, dehydration, cuts and abrasions, falls, asthma etc.	Major	High	visitor registration, make risks known to visitors, recommend appropriate safety and medical equipment, develop evacuation / recovery plan		
Extreme weather	Rare	exposure, injury, dehydration	Major	Moderate	visitor registration provide weather information to visitors, make risks known to visitors, recommend appropriate safety and medical equipment, develop evacuation / recovery plan, signage		

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Conservation Category Swan Coastal Plain Geomorphic Wetlands (DPaW 2014)

Contaminated Sites Register (DER 2014)

Directory of Important Wetlands (DSEWPaC 2008)

Environmental Protection (Swan Coastal Plain Lakes) Policy (EPA 2010)

Environmentally Sensitive Areas (DER 2014)

Hedde Vegetation (DAFWA 2009)

RAMSAR sites (DPaW 2014)

Soil Landscape systems (DAFWA 2007)



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## GLOSSARY

Tramway Reserve - tenured land

Tramway Reserve estimated original route –where the exact location of the route is uncertain in some areas

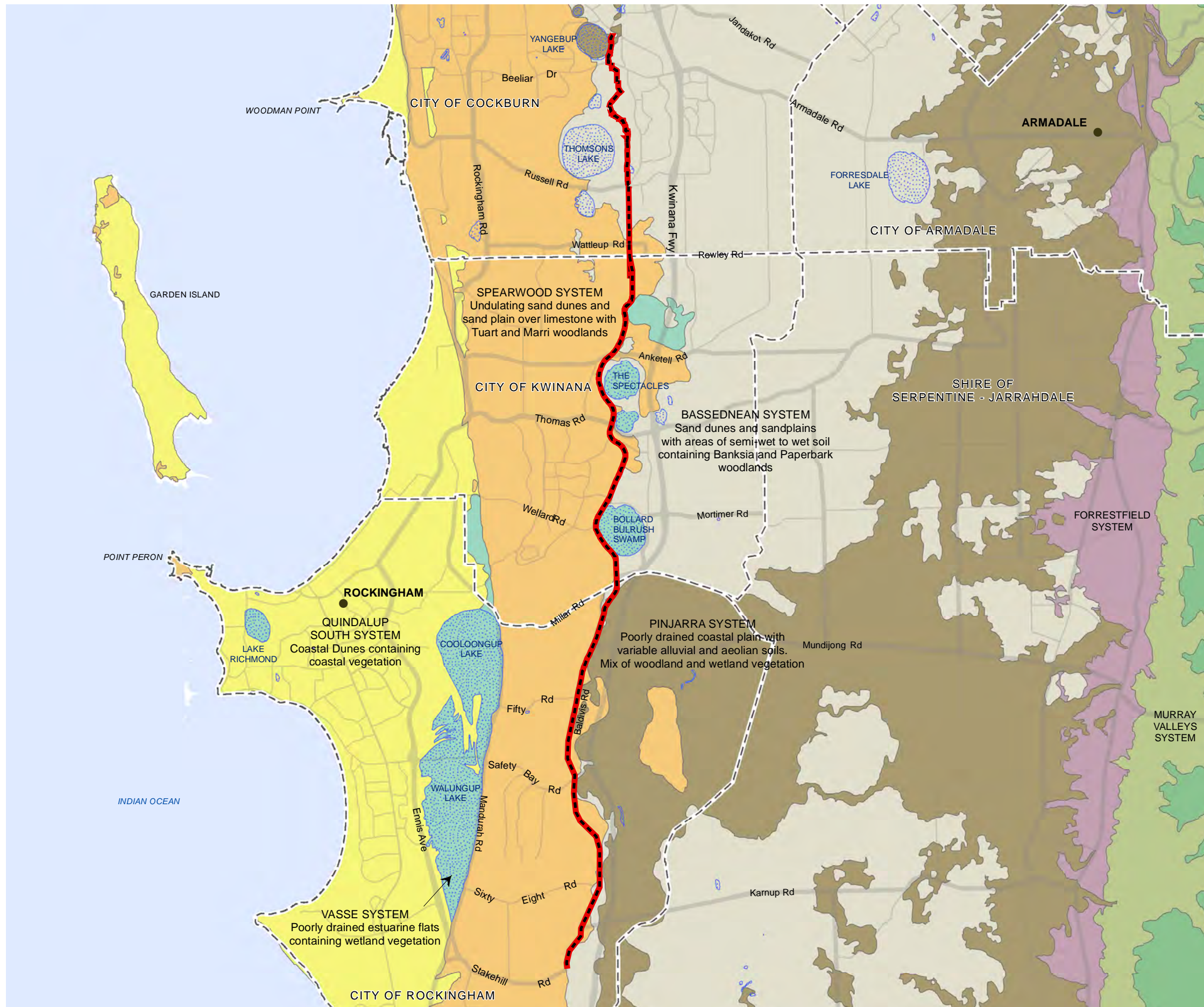
Tramway Trail alignment - specific location of the trail

Proposed Trail - future planned trail.

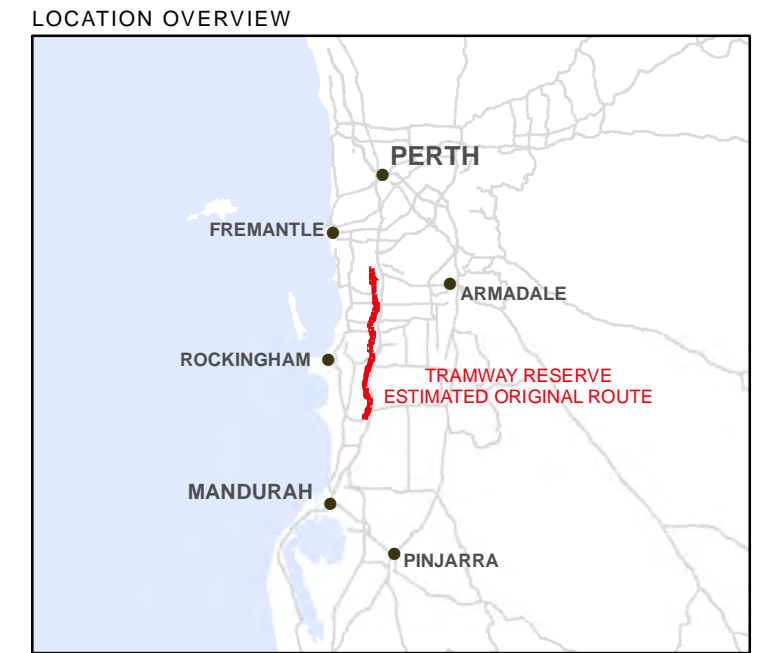
ANZECC	Australian and New Zealand Environment Conservation Council
App	Applications
AS	Australian Standard
ASL	Above Sea Level
BF	Bush Forever
CCW	Conservation Category Wetland
CD	Compact Disc
CoC	City of Cockburn
CoK	City of Kwinana
CoR	City of Rockingham
DAA	Department of Aboriginal Affairs
DAFWA	Department of Agriculture and Food Western Australia
DER	Department of Environment Regulation
DPaW	Department of Parks and Wildlife
DOP	Department of Planning
DPI	Department of Planning and Infrastructure
DRF	Declared Rare Flora
DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities
DUP	Dual Use Path
EPBC Act	Environment Protection and Biodiversity Conservation Act
ESA	Environmentally Sensitive Areas
EPA	Environmental Protection Authority
EPP	Environmental Protection Policy
GIS	Geographic Information Systems
ISO	International Organization for Standardization
LGA	Local Government Area
MP3	Moving Picture Experts Group
NRM	Natural Resource Management
NZS	New Zealand Standard
POS	Public Open Space
RAMSAR	Ramsar Convention
QR	Quick Response
SCP	Swan Coastal Plain
TBD	To Be Determined
TEC	Threatened Ecological Community
UCL	Unallocated Crown Land
WA	Western Australia
WAPC	Western Australian Planning Commission

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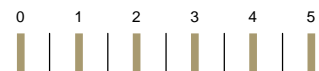
# APPENDIX A ENVIRONMENT MAPS



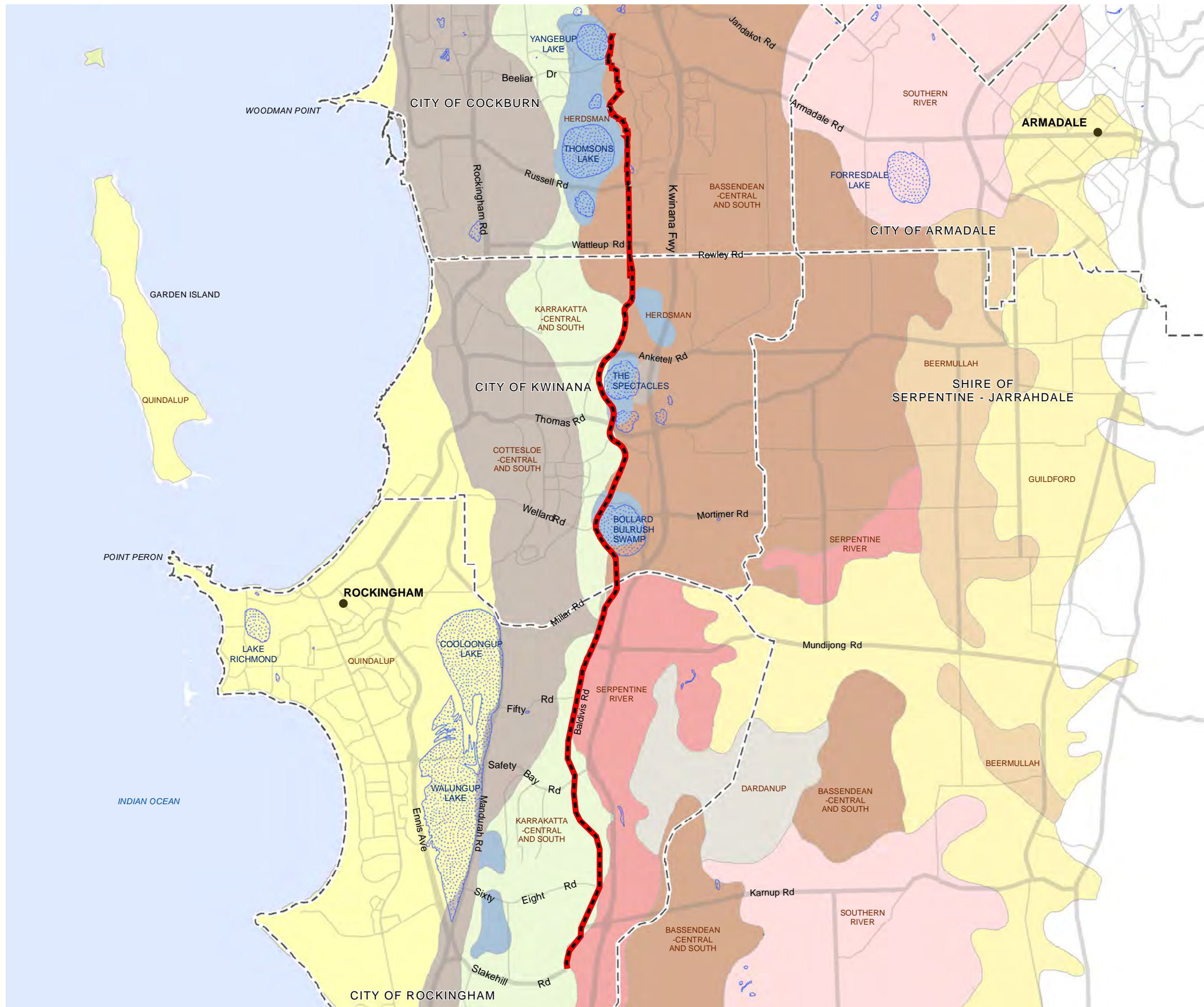
- Legend**
- Tramway Reserve estimated original route
  - Water bodies
  - Local Government Boundary
- Soil Landscape System**
- Bassendean System
  - Darling Plateau System
  - Forrestfield System
  - Murray Valleys System
  - Pinjarra System
  - Quindalup South System
  - Spearwood System
  - Vasse System



GDA 1994 MGA Zone 50







**Legend**

- Tramway Reserve estimated original route
- Water bodies
- Local Government Boundary

**Heddle Vegetation Complexes**

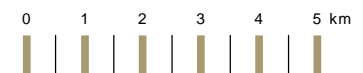
(Department of Agriculture and Food WA 2009)

- BASSENDEAN -CENTRAL AND SOUTH-TRANSITION VEGETATION:** Woodland of *E. marginata* - *C. calophylla* with well defined second storey of *Allocasuarina fraseriana* and *Banksia grandis* on the deeper soils and a closed scrub on the moister sites. The understorey species reflect simila
- BASSENDEAN -CENTRAL AND SOUTH:** Vegetation ranges from woodland of *E. marginata* - *C. fraseriana* - *Banksia* spp. to low woodland of *Melaleuca* spp. and sedgelands on the moister sites. This area includes the transition of *E. marginata* to *E. todiana* in the vicinity of Perth.
- BEERMULLAH:** Mixture of low open forest of *C. obesa* and open woodland of *C. calophylla* - *E. wandoo* - *E. marginata*. Minor components include closed scrub of *Melaleuca* spp. and occurrence of *Actinostrobos pyramidalis*.
- COTTESLOE -CENTRAL AND SOUTH:** Mosaic of woodland of *E. gomphocephala* and open forest of *E. gomphocephala* - *E. marginata* - *C. calophylla*; closed heath on the limestone outcrops.
- DARDANUP:** Mosaic of vegetation types characteristic of adjacent vegetation complexes such as Serpentine River, Southern River and Guildford.
- GUILDFORD:** A mixture of open forest to tall open forest of *C. calophylla* - *E. wandoo* - *E. marginata* and woodland of *E. wandoo* (with rare occurrences of *E. lane-poolie*). Minor components include *E. rudis* - *M. raphiophylla*.
- HERDSMAN:** Sedgelands and fringing woodland of *E. rudis* - *Melaleuca* spp.
- KARRAKATTA -CENTRAL AND SOUTH:** Predominantly low open forest of *E. gomphocephala* - *E. marginata* - *C. calophylla* and woodland of *E. marginata* - *Banksia* spp.
- QUINDALUP:** Coastal dune complex consisting mainly of two alliances - the strand and foredune alliance and the mobile and stable dune alliance. Local variations include the low closed forest of *M. lanceolata* - *Callitris preissii* and the closed scrub of *Acacia roste*
- SERPENTINE RIVER:** Closed scrub of *Melaleuca* spp. and fringing woodland of *E. rudis* - *M. raphiophylla* along streams.
- SOUTHERN RIVER:** Open woodland of *C. calophylla* - *E. marginata* - *Banksia* spp. with fringing woodland of *E. rudis* - *M. raphiophylla* along the creek beds.

**LOCATION OVERVIEW**












GDA 1994 MGA Zone 50

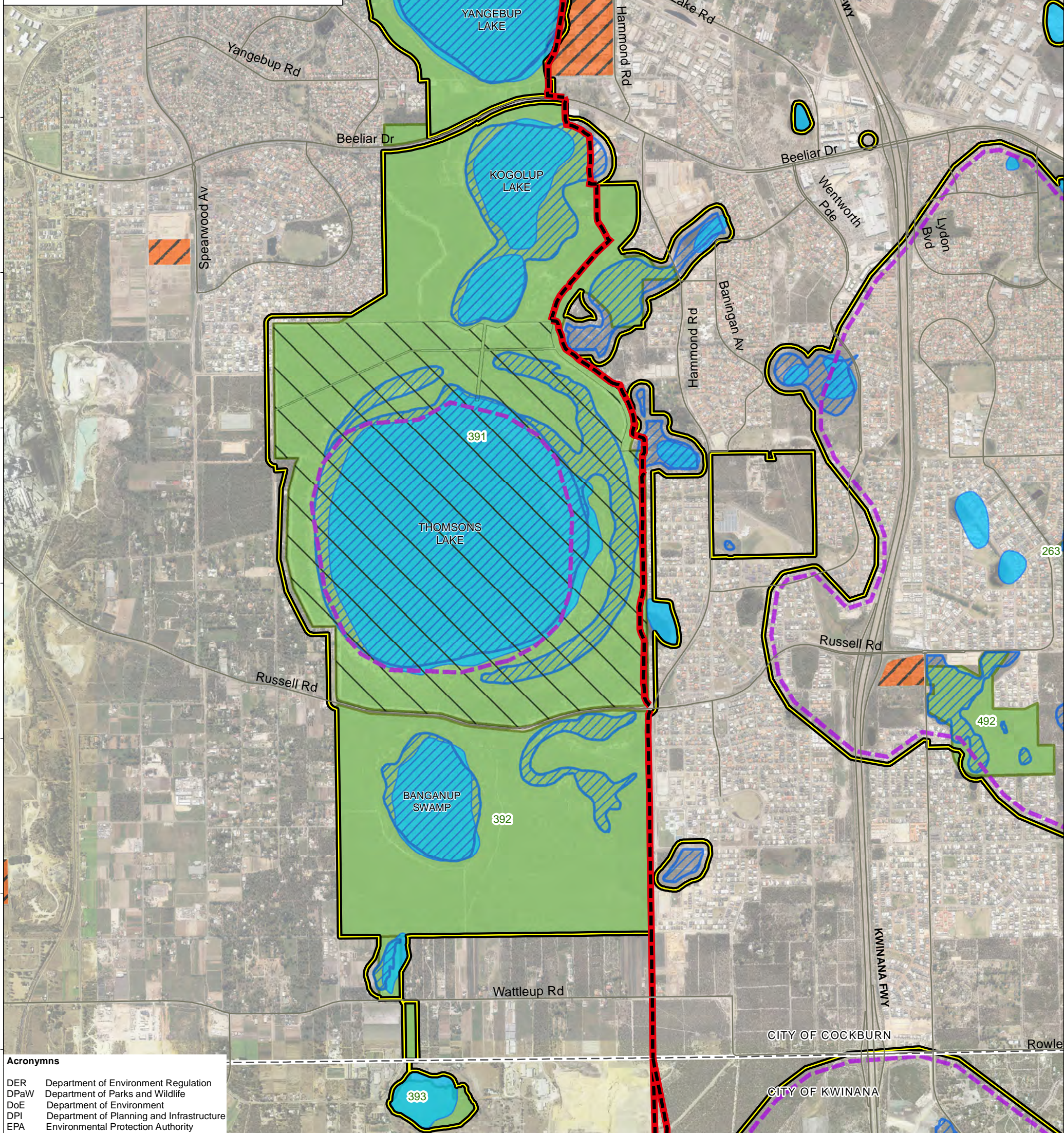




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**LEGEND**

-  Tramway Reserve estimated original route
-  Local Government Boundary
-  Environmentally Sensitive Areas (DER)
-  Contaminated Sites Register (DER 2014)
-  RAMSAR Sites (DPAW 2014)
-  Directory of Important Wetlands (DoE 2008)
-  Conservation Category Wetlands (DPaW 2014)
-  Environmental Protection Policy (EPP) Lakes (EPA 2010)
-  Bush Forever Sites (DPI 2004) Site numbers shown on map



**Acronyms**

DER	Department of Environment Regulation
DPaW	Department of Parks and Wildlife
DoE	Department of Environment
DPI	Department of Planning and Infrastructure
EPA	Environmental Protection Authority

IMAGERY SOURCE: NEARMAP



AUTHOR: SB                      CHECKED: JN  
 DATE: AUGUST 2015              PROJECT NO: 3238-15

Scale 1:25,000 @ A3

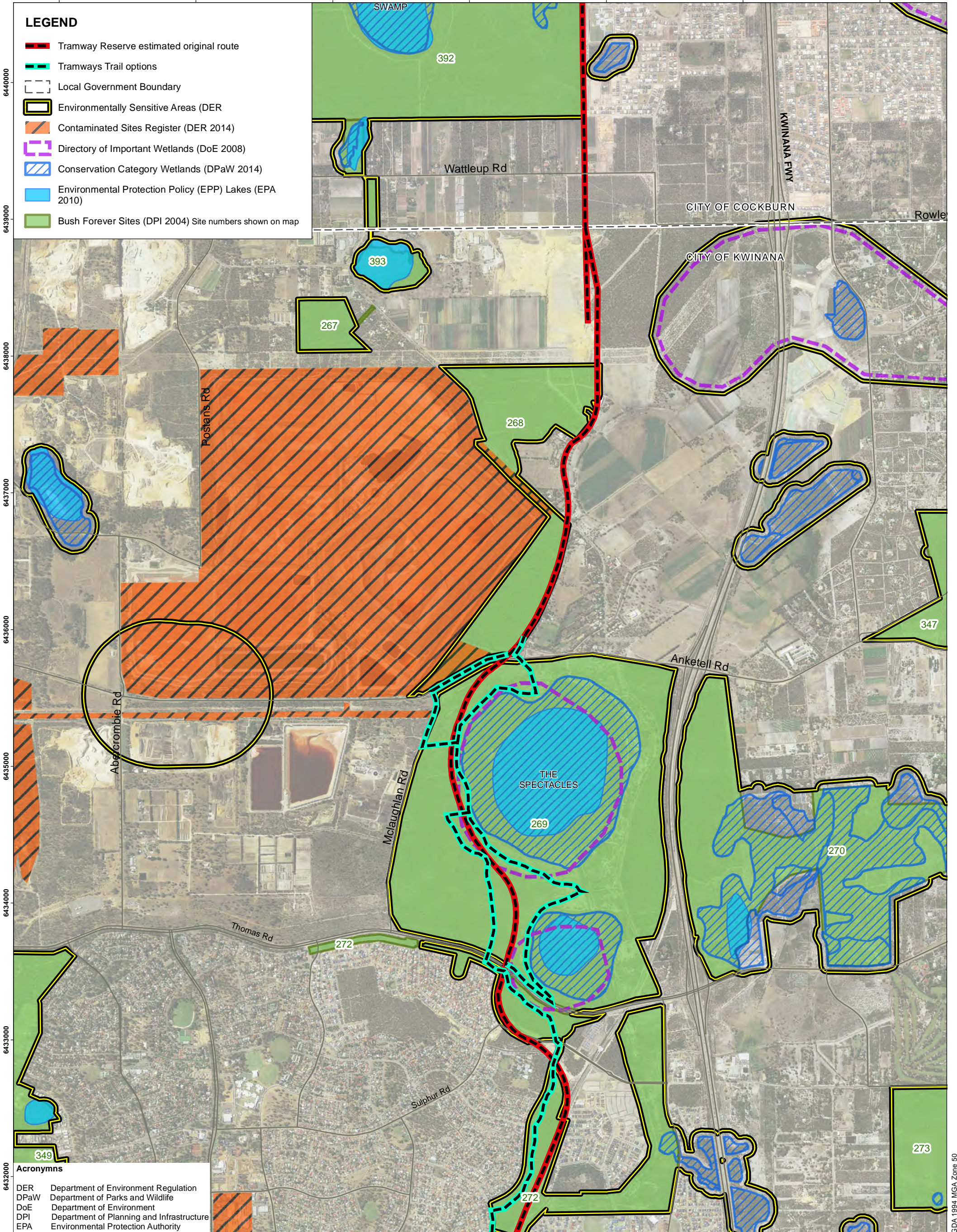


9 STIRLING HIGHWAY, NORTH FREMANTLE WA 6159  
 (08) 9430 8955 WWW.ECOSCAPE.COM.AU

TRAMWAY TRAIL DEVELOPMENT PLAN  
 CLIENT: SOUTH WEST CORRIDOR DEVELOPMENT FOUNDATION  
**ENVIRONMENTAL CONTEXT**  
**CITY OF COCKBURN**  
**MAP 3**

GDA 1994 MGA Zone 50





**LEGEND**

- Tramway Reserve estimated original route
- Tramways Trail options
- Local Government Boundary
- Environmentally Sensitive Areas (DER)
- Contaminated Sites Register (DER 2014)
- Directory of Important Wetlands (DoE 2008)
- Conservation Category Wetlands (DPaW 2014)
- Environmental Protection Policy (EPP) Lakes (EPA 2010)
- Bush Forever Sites (DPI 2004) Site numbers shown on map

**Acronyms**

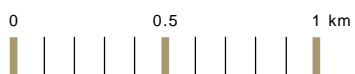
DER	Department of Environment Regulation
DPaW	Department of Parks and Wildlife
DoE	Department of Environment
DPI	Department of Planning and Infrastructure
EPA	Environmental Protection Authority

IMAGERY SOURCE: NEARMAP



AUTHOR: SB                      CHECKED: JN  
 DATE: AUGUST 2015              PROJECT NO: 3238-15

Scale 1:25,000 @ A3



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 (08) 9430 8955 WWW.ECOSCAPE.COM.AU

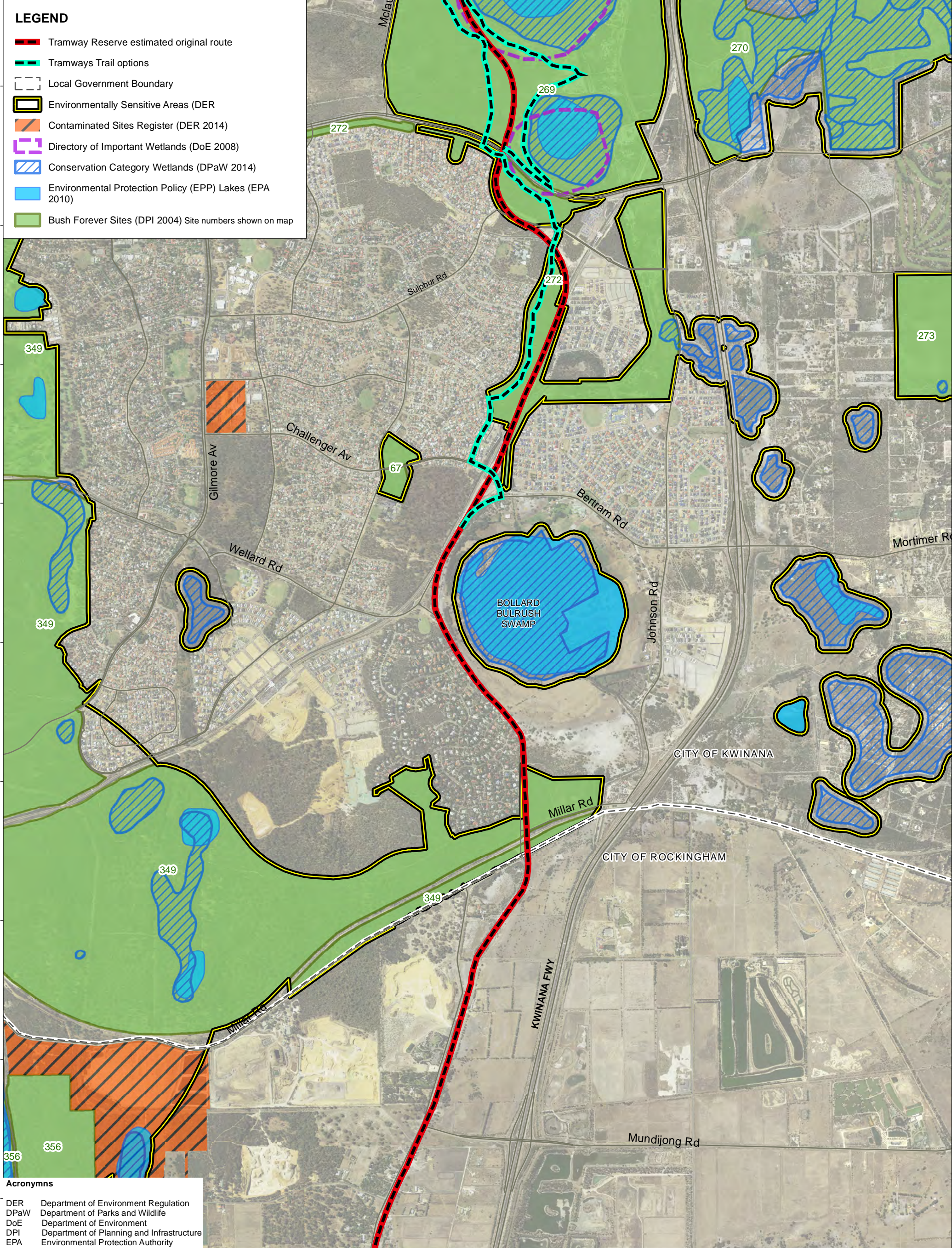
TRAMWAY TRAIL DEVELOPMENT PLAN  
 CLIENT: SOUTH WEST CORRIDOR DEVELOPMENT FOUNDATION  
**ENVIRONMENTAL CONTEXT**  
**CITY OF KWINANA**  
**MAP 4**



387000 388000 389000 390000 391000 392000 393000

**LEGEND**

-  Tramway Reserve estimated original route
-  Tramways Trail options
-  Local Government Boundary
-  Environmentally Sensitive Areas (DER)
-  Contaminated Sites Register (DER 2014)
-  Directory of Important Wetlands (DoE 2008)
-  Conservation Category Wetlands (DPaW 2014)
-  Environmental Protection Policy (EPP) Lakes (EPA 2010)
-  Bush Forever Sites (DPI 2004) Site numbers shown on map



**Acronyms**

DER	Department of Environment Regulation
DPaW	Department of Parks and Wildlife
DoE	Department of Environment
DPI	Department of Planning and Infrastructure
EPA	Environmental Protection Authority

IMAGERY SOURCE: NEARMAP



AUTHOR: SB                      CHECKED: JN  
 DATE: AUGUST 2015              PROJECT NO: 3238-15

Scale 1:25,000 @ A3



9 STIRLING HIGHWAY, NORTH FREMANTLE WA 6159  
 (08) 9430 8955 WWW.ECOSCAPE.COM.AU

TRAMWAY TRAIL DEVELOPMENT PLAN  
 CLIENT: SOUTH WEST CORRIDOR DEVELOPMENT FOUNDATION  
**ENVIRONMENTAL CONTEXT**  
**CITY OF KWINANA**  
**MAP 5**

GDA 1994 MGA Zone 50





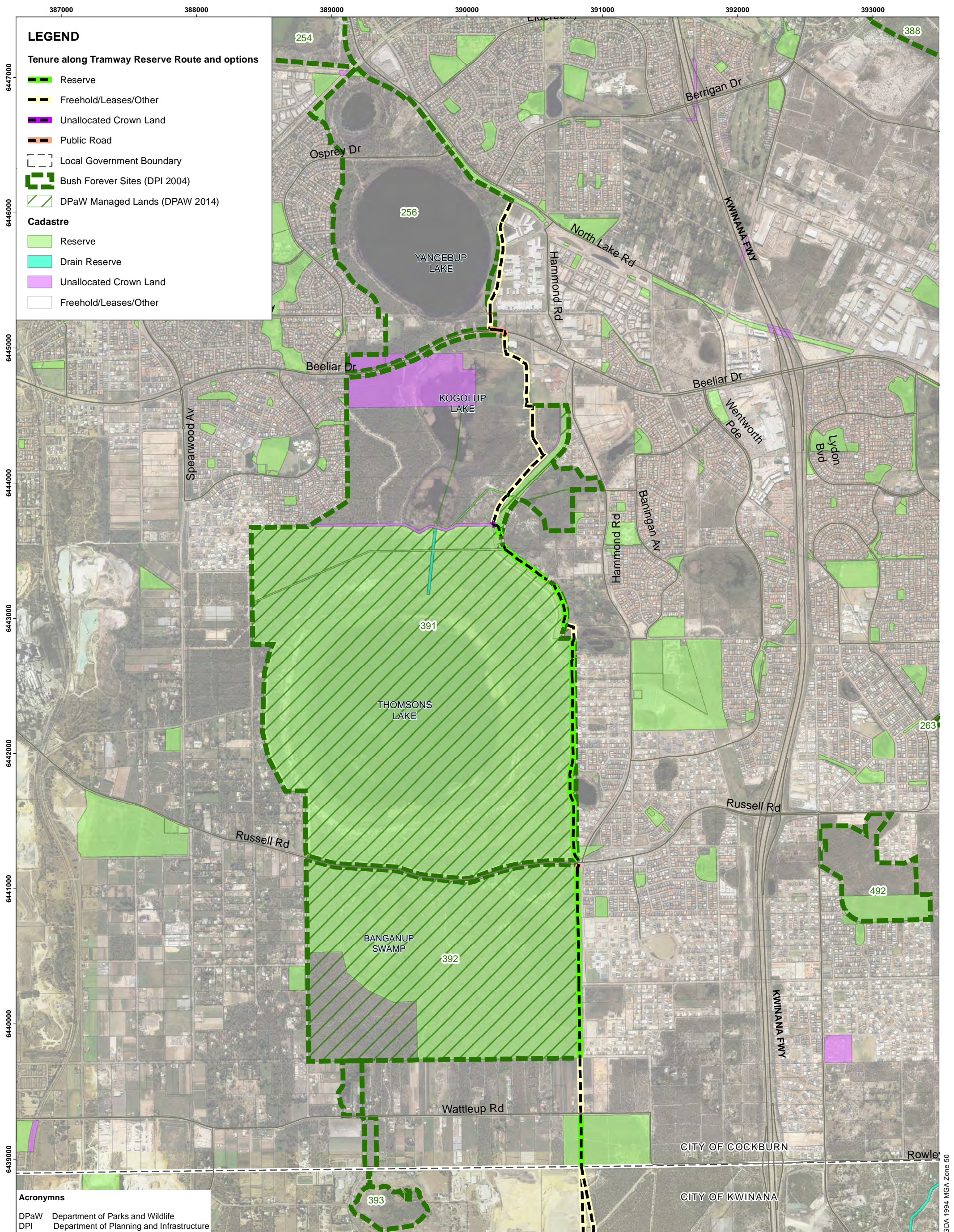






## APPENDIX B TENURE MAPS





**LEGEND**

**Tenure along Tramway Reserve Route and options**

- Reserve
- Freehold/Leases/Other
- Unallocated Crown Land
- Public Road
- Local Government Boundary
- Bush Forever Sites (DPI 2004)
- DPaW Managed Lands (DPAW 2014)

**Cadastre**

- Reserve
- Drain Reserve
- Unallocated Crown Land
- Freehold/Leases/Other

**Acronyms**  
 DPaW Department of Parks and Wildlife  
 DPI Department of Planning and Infrastructure

IMAGERY SOURCE: NEARMAP



AUTHOR: SB                      CHECKED: JN  
 DATE: AUGUST 2015              PROJECT NO: 3238-15

Scale 1:25,000 @ A3



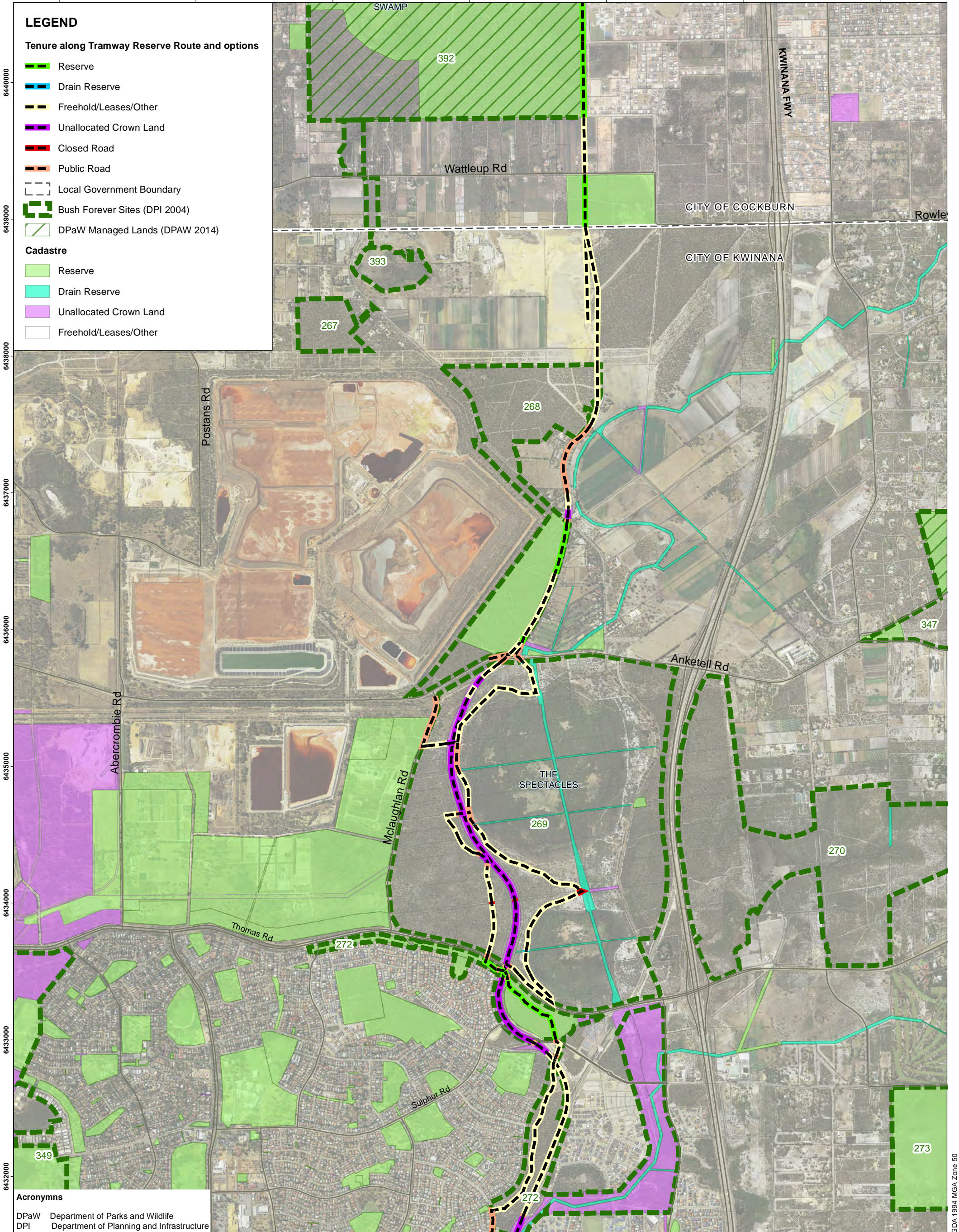
9 STIRLING HIGHWAY, NORTH FREMANTLE WA 6159  
 (08) 9430 8955 WWW.ECOSCAPE.COM.AU

TRAMWAY TRAIL DEVELOPMENT PLAN  
 CLIENT: SOUTH WEST CORRIDOR DEVELOPMENT FOUNDATION

**TENURE**  
**CITY OF COCKBURN**  
**MAP 8**

GDA 1994 MGA Zone 50





**LEGEND**

**Tenure along Tramway Reserve Route and options**

- Reserve
- Drain Reserve
- Freehold/Leases/Other
- Unallocated Crown Land
- Closed Road
- Public Road
- Local Government Boundary
- Bush Forever Sites (DPI 2004)
- DPaW Managed Lands (DPAW 2014)

**Cadastre**

- Reserve
- Drain Reserve
- Unallocated Crown Land
- Freehold/Leases/Other

**Acronyms**

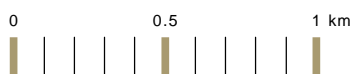
DPaW Department of Parks and Wildlife  
 DPI Department of Planning and Infrastructure

IMAGERY SOURCE: NEARMAP



AUTHOR: SB CHECKED: JN  
 DATE: AUGUST 2015 PROJECT NO: 3238-15

Scale 1:25,000 @ A3





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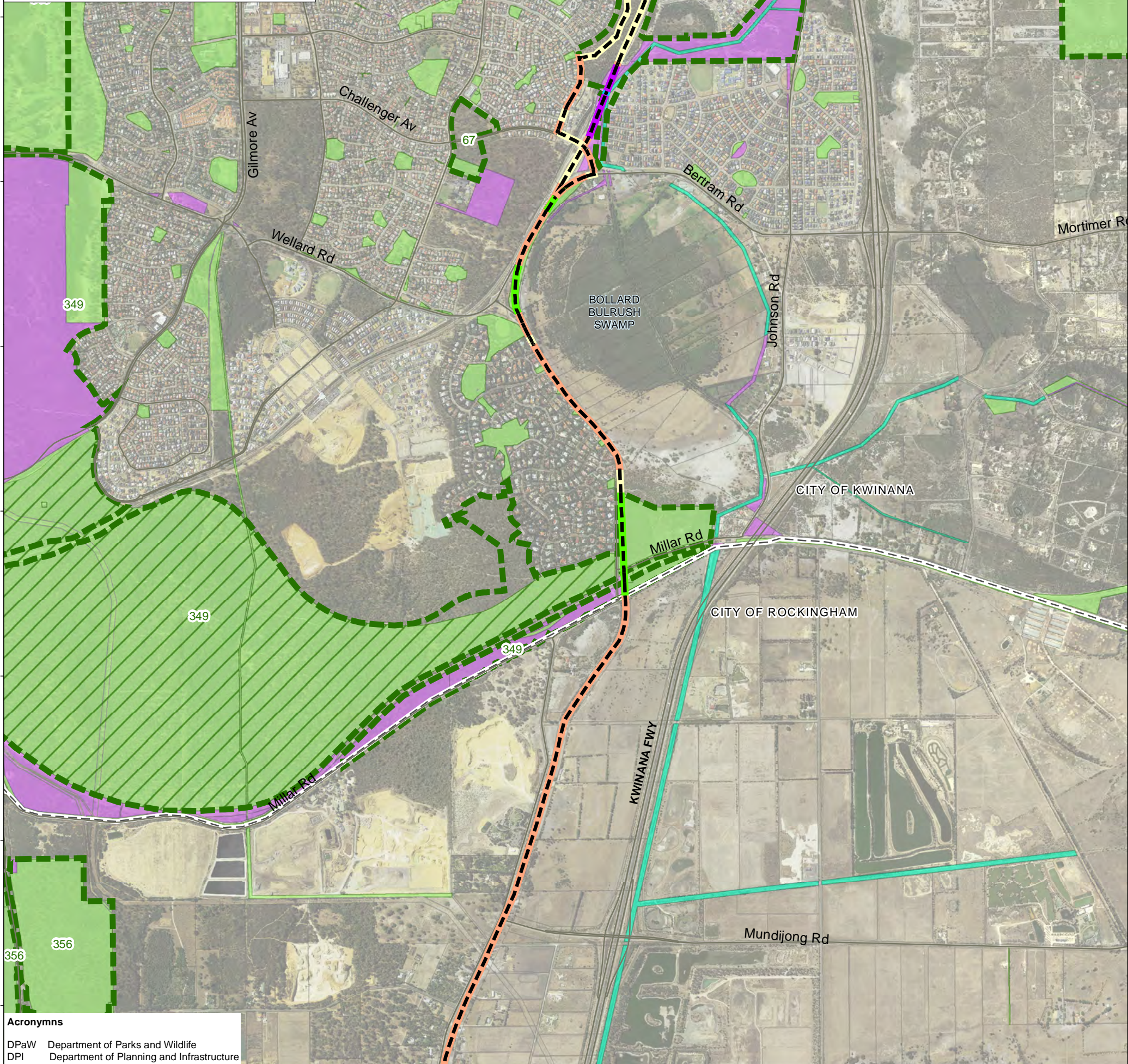
**LEGEND**

**Tenure along Tramway Reserve Route and options**

- Reserve
- Drain Reserve
- Freehold/Leases/Other
- Unallocated Crown Land
- Closed Road
- Public Road
- Local Government Boundary
- Bush Forever Sites (DPI 2004)
- DPaW Managed Lands (DPAW 2014)

**Cadastre**

- Reserve
- Drain Reserve
- Unallocated Crown Land
- Freehold/Leases/Other



**Acronyms**

DPaW Department of Parks and Wildlife  
 DPI Department of Planning and Infrastructure

IMAGERY SOURCE: NEARMAP



AUTHOR: SB CHECKED: JN  
 DATE: AUGUST 2015 PROJECT NO: 3238-15

Scale 1:25,000 @ A3



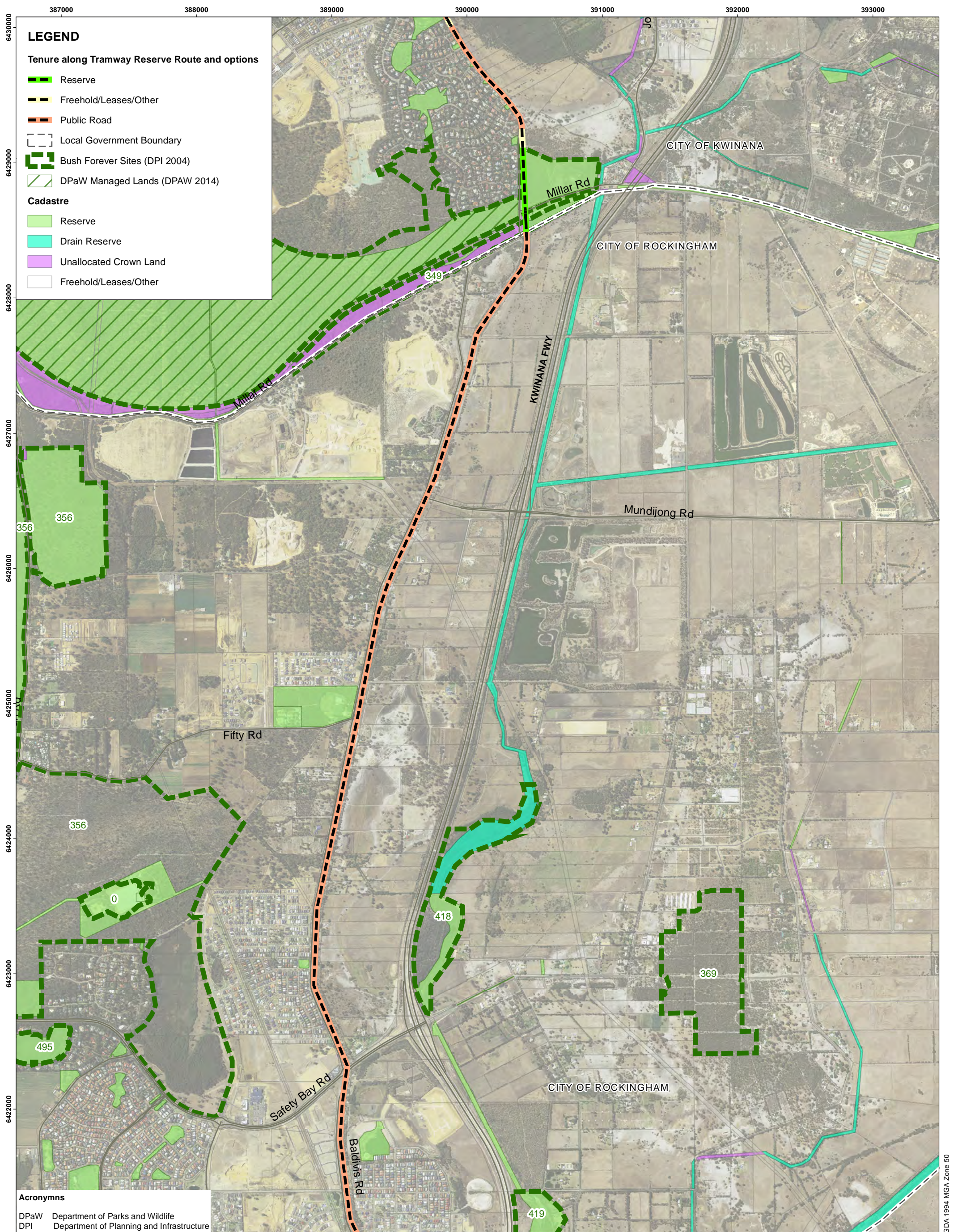
9 STIRLING HIGHWAY, NORTH FREMANTLE WA 6159  
 (08) 9430 8955 WWW.ECOSCAPE.COM.AU

TRAMWAY TRAIL DEVELOPMENT PLAN  
 CLIENT: SOUTH WEST CORRIDOR DEVELOPMENT FOUNDATION

**TENURE**  
**CITY OF KWINANA**  
**MAP 10**

GDA 1994 MGA Zone 50





**LEGEND**

**Tenure along Tramway Reserve Route and options**

- Reserve
- Freehold/Leases/Other
- Public Road
- Local Government Boundary
- Bush Forever Sites (DPI 2004)
- DPaW Managed Lands (DPAW 2014)

**Cadastre**

- Reserve
- Drain Reserve
- Unallocated Crown Land
- Freehold/Leases/Other

**Acronyms**  
 DPaW Department of Parks and Wildlife  
 DPI Department of Planning and Infrastructure

IMAGERY SOURCE: NEARMAP



9 STIRLING HIGHWAY, NORTH FREMANTLE WA 6159  
 (08) 9430 8955 WWW.ECOSCAPE.COM.AU

AUTHOR: SB                      CHECKED: JN  
 DATE: AUGUST 2015              PROJECT NO: 3238-15

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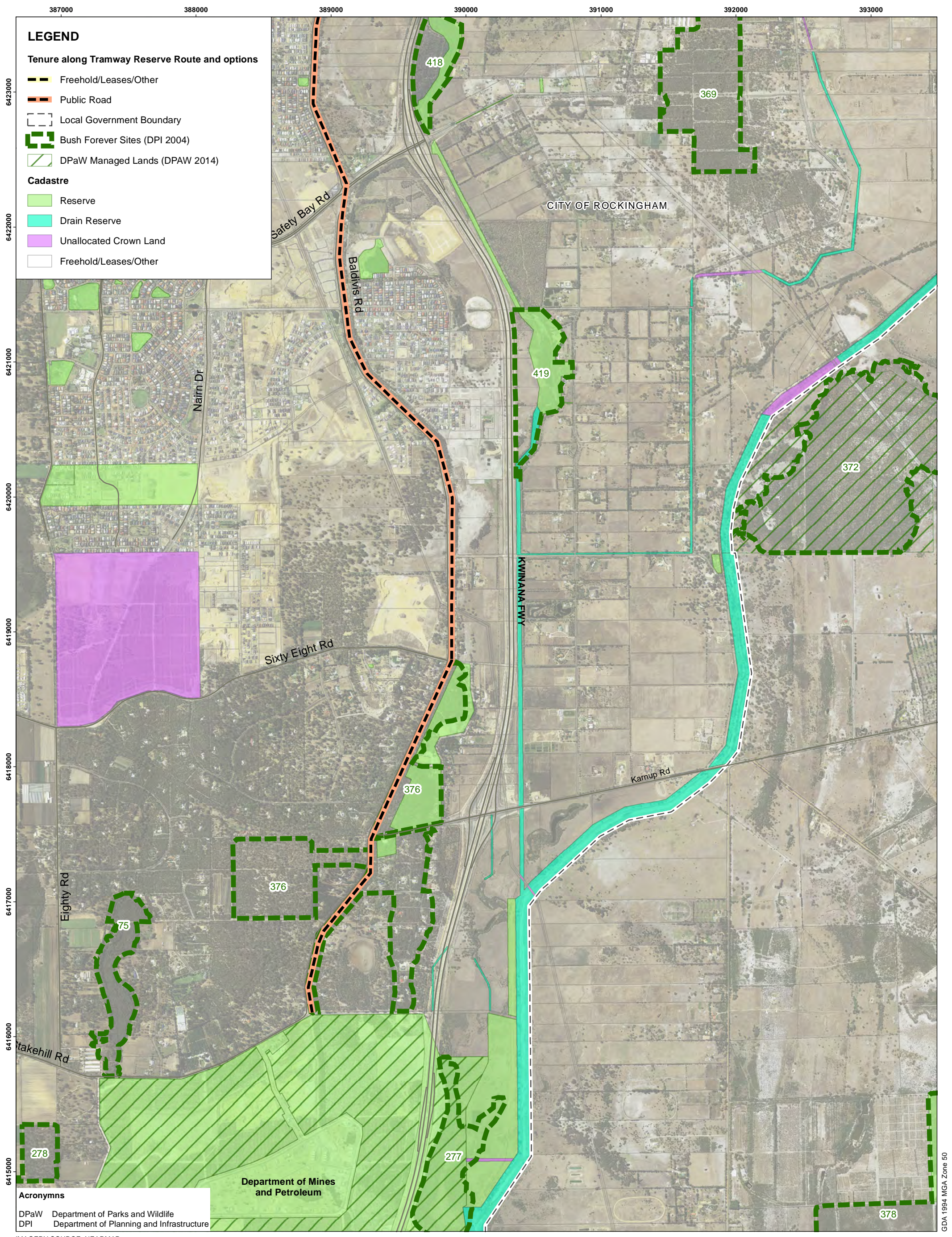


TRAMWAY TRAIL DEVELOPMENT PLAN  
 CLIENT: SOUTH WEST CORRIDOR DEVELOPMENT FOUNDATION

**TENURE**  
**CITY OF ROCKINGHAM**  
**MAP 11**

GDA 1994 MGA Zone 50





**LEGEND**

**Tenure along Tramway Reserve Route and options**

- Freehold/Leases/Other
- Public Road
- Local Government Boundary
- Bush Forever Sites (DPI 2004)
- DPaW Managed Lands (DPaW 2014)

**Cadastral**

- Reserve
- Drain Reserve
- Unallocated Crown Land
- Freehold/Leases/Other

**Acronyms**  
 DPaW Department of Parks and Wildlife  
 DPI Department of Planning and Infrastructure

IMAGERY SOURCE: NEARMAP



9 STIRLING HIGHWAY, NORTH FREMANTLE WA 6159  
 (08) 9430 8955 WWW.ECOSCAPE.COM.AU

AUTHOR: SB CHECKED: JN  
 DATE: AUGUST 2015 PROJECT NO: 3238-15

Scale 1:25,000 @ A3



TRAMWAY TRAIL DEVELOPMENT PLAN  
 CLIENT: SOUTH WEST CORRIDOR DEVELOPMENT FOUNDATION

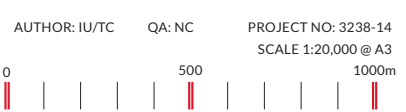
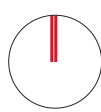
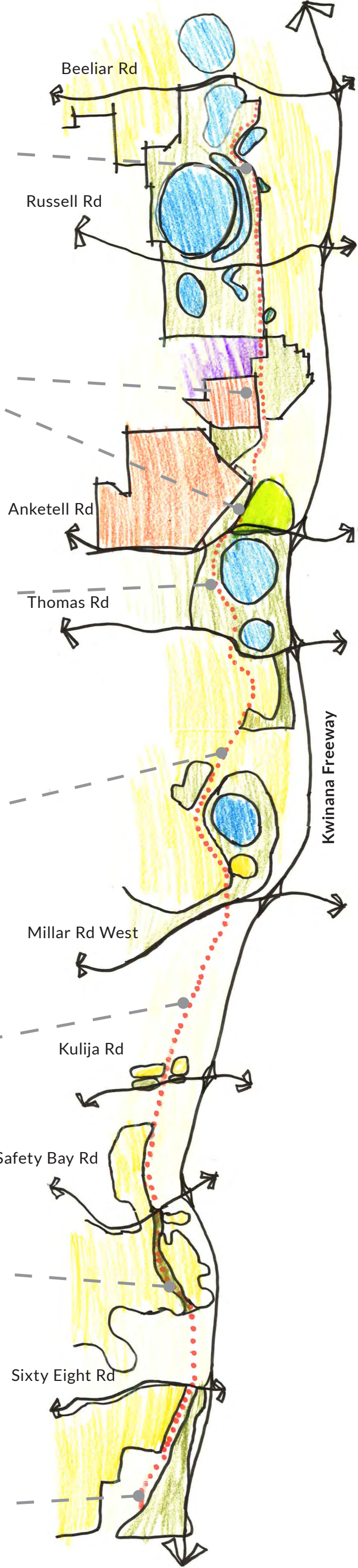
**TENURE**  
**CITY OF ROCKINGHAM**  
**MAP 12**

GDA 1994 MGA Zone 50



# APPENDIX C SITE CHARACTER MAP










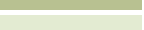




















# APPENDIX D TRAIL CONDITION MAPS






**LEGEND**

-  LGA boundary
  -  Government tenure
  -  Aboriginal Heritage Sites DAA-001
  -  CCW Wetlands DPAW-017
  -  RAMSAR Site DPAW-017
  -  Bush Forever DOP 2014
  -  Native vegetation DAFWA 2012
  -  Reserves 2005
  -  Primary roads
  -  Secondary roads
  -  Minor roads
  -  Railway line
  -  High point
  -  Views
- PROPOSED**
-  Development
  -  Public Open space
  -  School



**TRAILS - TRAMWAY TRAIL**

-  Tramway Reserve estimated original route
- EXISTING**
-  Asphalt red
  -  Asphalt grey
  -  Concrete
  -  Limestone
  -  Sand
  -  Mulch

**TRAILS - NODES, CROSSINGS**

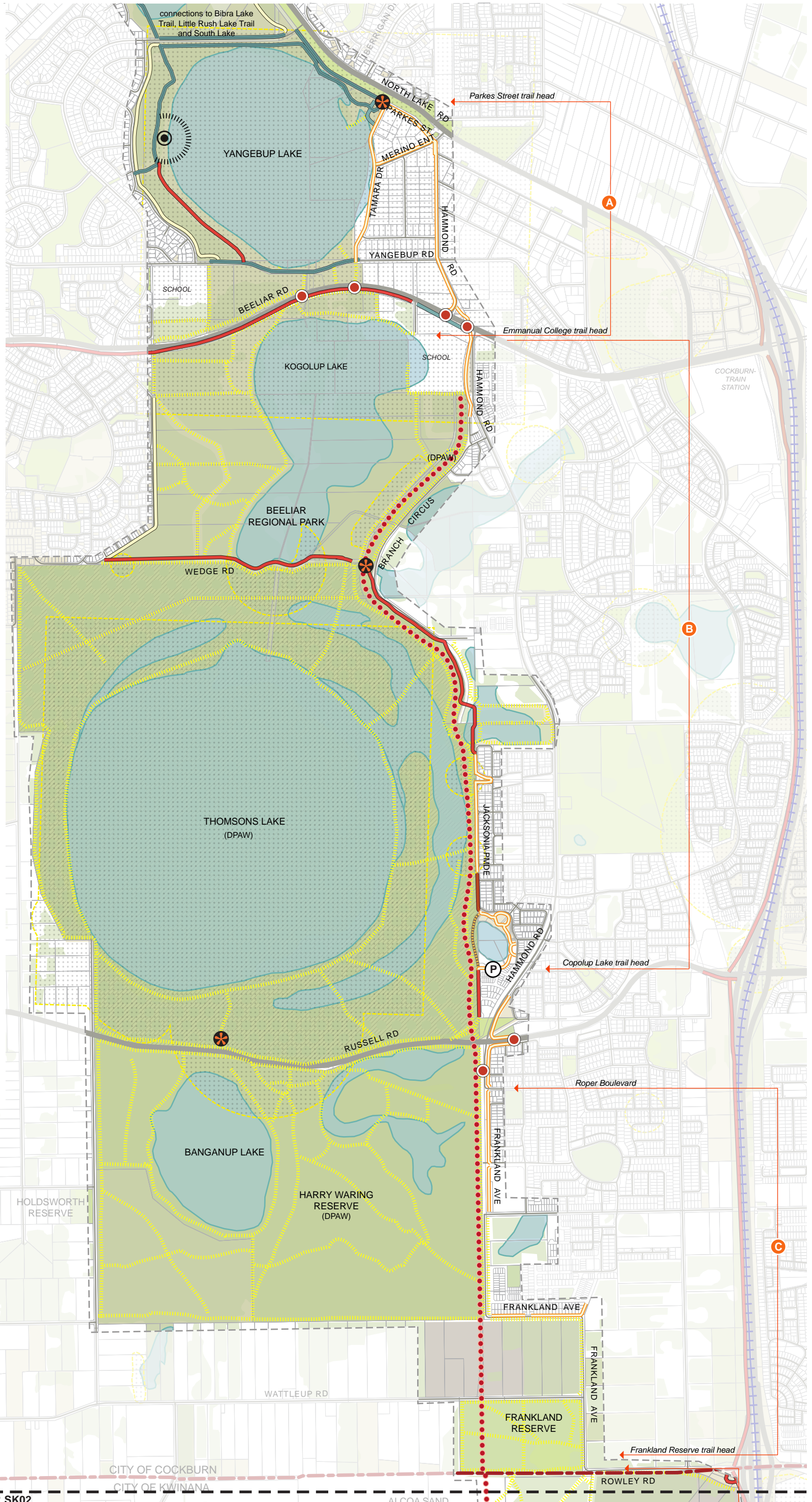
- EXISTING**
-  Trail head
  -  Road median pedestrian refuge
  -  Parking

**TRAILS - LOOP TRAILS**

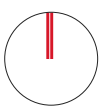
- EXISTING**
-  Major trail
  -  Minor trail

**Glossary**

- CCW Conservation Category Wetland
- DAA Department of Aboriginal Affairs
- DAFWA Department of Agriculture and Food Western Australia
- DPAW Department of Parks and Wildlife
- LGA Local Government Authority
- RAMSAR Ramsar Convention


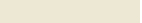







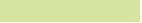






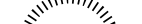


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**LEGEND**

-  LGA boundary
-  Government tenure
-  Aboriginal Heritage Sites DAA-001
-  CCW Wetlands DPAW-017
-  RAMSAR Site DPAW-017
-  Bush Forever DOP 2014
-  Native vegetation DAFWA 2012
-  Reserves 2005
-  Primary roads
-  Secondary roads
-  Minor roads
-  Railway line
-  High point
-  Views
- PROPOSED**
-  Development
-  Public Open space
-  School



**TRAILS - TRAMWAY TRAIL**

-  Tramway Reserve estimated original route
- EXISTING**
-  Asphalt red
-  Asphalt grey
-  Concrete
-  Limestone
-  Sand
-  Mulch

**TRAILS - NODES, CROSSINGS**

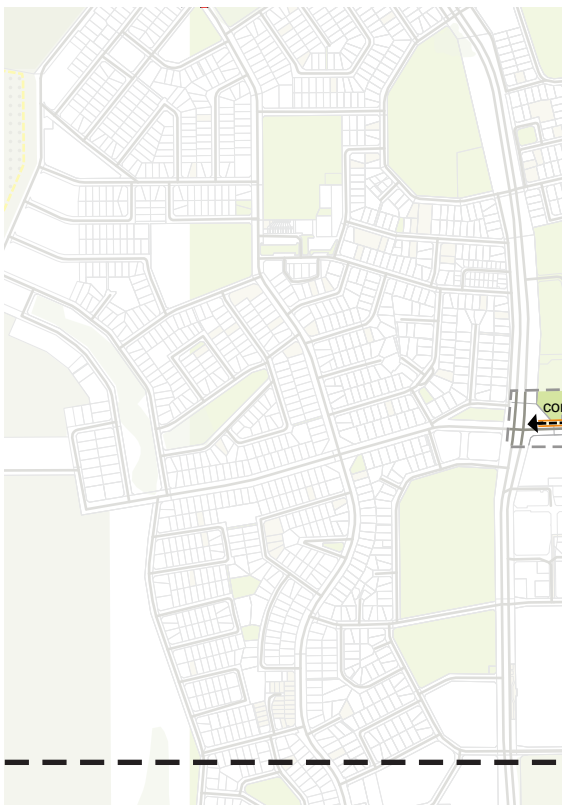
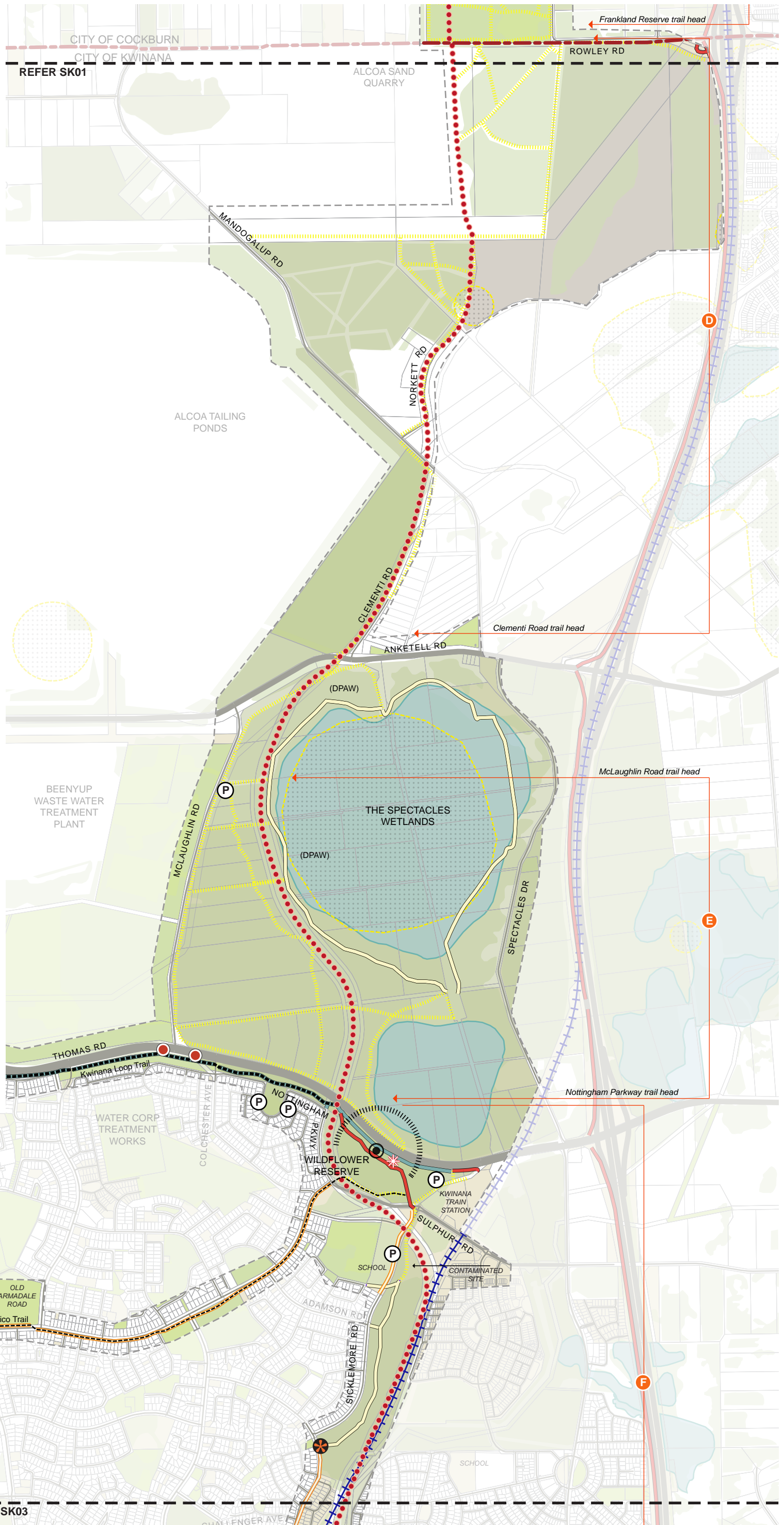
- EXISTING**
-  Trail head
-  Road median pedestrian refuge
-  Parking

**TRAILS - LOOP TRAILS**

- EXISTING**
-  Major trail
-  Minor trail


















**Glossary**

- CCW Conservation Category Wetland
- DAA Department of Aboriginal Affairs
- DAFWA Department of Agriculture and Food Western Australia
- DPAW Department of Parks and Wildlife
- LGA Local Government Authority
- RAMSAR Ramsar Convention















**LEGEND**

-  LGA boundary
  -  Government tenure
  -  Aboriginal Heritage Sites DAA-001
  -  CCW Wetlands DPAW-017
  -  RAMSAR Site DPAW-017
  -  Bush Forever DOP 2014
  -  Native vegetation DAFWA 2012
  -  Reserves 2005
  -  Primary roads
  -  Secondary roads
  -  Minor roads
  -  Railway line
  -  High point
  -  Views
- PROPOSED**
-  Development
  -  Public Open space
  -  School

**TRAILS - TRAMWAY TRAIL**

-  Tramway Reserve estimated original route
- EXISTING**
-  Asphalt red
  -  Asphalt grey
  -  Concrete
  -  Limestone
  -  Sand
  -  Mulch

**TRAILS - NODES, CROSSINGS**

- EXISTING**
-  Trail head
  -  Road median pedestrian refuge
  -  Parking

**TRAILS - LOOP TRAILS**

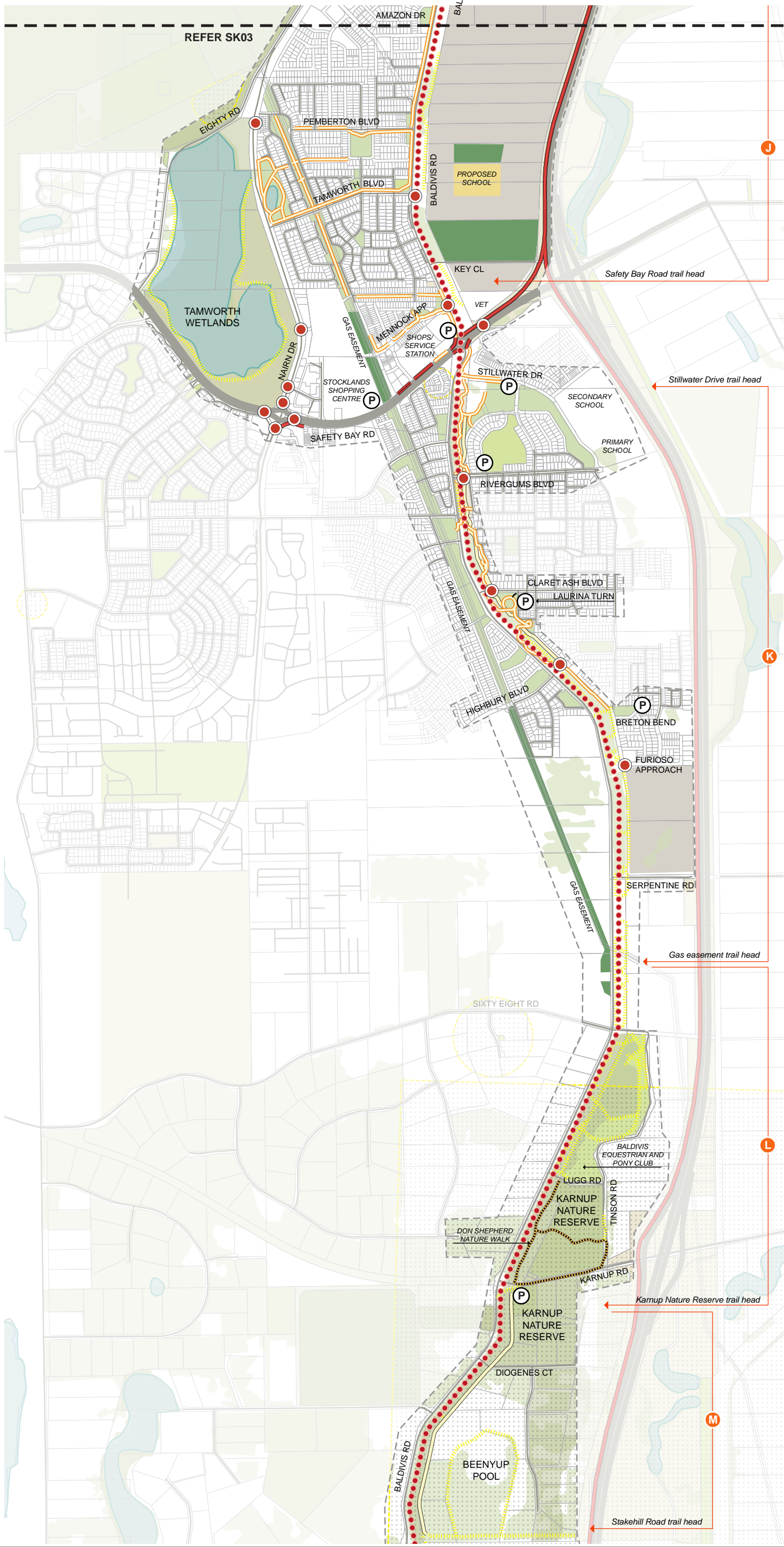
- EXISTING**
-  Major trail
  -  Minor trail

**Glossary**

- CCW Conservation Category Wetland
- DAA Department of Aboriginal Affairs
- DAFWA Department of Agriculture and Food Western Australia
- DPAW Department of Parks and Wildlife
- LGA Local Government Authority
- RAMSAR Ramsar Convention







**LEGEND**

- LGA boundary
- Government tenure
- Aboriginal Heritage Sites DAA-001
- CCW Wetlands DPAW-017
- RAMSAR Site DPAW-017
- Bush Forever DOP 2014
- Native vegetation DAFWA 2012
- Reserves 2005
- Primary roads
- Secondary roads
- Minor roads
- Railway line
- High point
- Views
- PROPOSED**
- Development
- Public Open space
- School

**TRAILS - TRAMWAY TRAIL**

- Tramway Reserve estimated original route
- EXISTING**
- Asphalt red
- Asphalt grey
- Concrete
- Limestone
- Sand
- Mulch

**TRAILS - NODES, CROSSINGS**

- EXISTING**
- Trail head
- Road median pedestrian refuge
- Parking

**TRAILS - LOOP TRAILS**

- EXISTING**
- Major trail
- Minor trail

**Glossary**

- CCW Conservation Category Wetland
- DAA Department of Aboriginal Affairs
- DAFWA Department of Agriculture and Food Western Australia
- DPAW Department of Parks and Wildlife
- LGA Local Government Authority
- RAMSAR Ramsar Convention



# APPENDIX E TRAIL CONCEPT MAPS





**LEGEND**

- LGA boundary
- Government tenure
- CCW Wetlands DPAW-017
- Bush Forever DoP 2014
- Native vegetation DAFWA 2012
- Reserves 2005
- Primary roads
- Secondary roads
- Minor roads
- Railway line
- Vermin proof fence
- High point
- Views
- PROPOSED**
- Development
- Public open space
- School

**TRAILS - TRAMWAY TRAIL**

- EXISTING**
- Asphalt red
- Asphalt grey
- Concrete
- Limestone
- Sand
- Mulch
- PROPOSED**
- Route over existing material
- Limestone path
- Concrete path
- Reinforced concrete path
- Future route

**TRAILS - NODES, CROSSINGS**

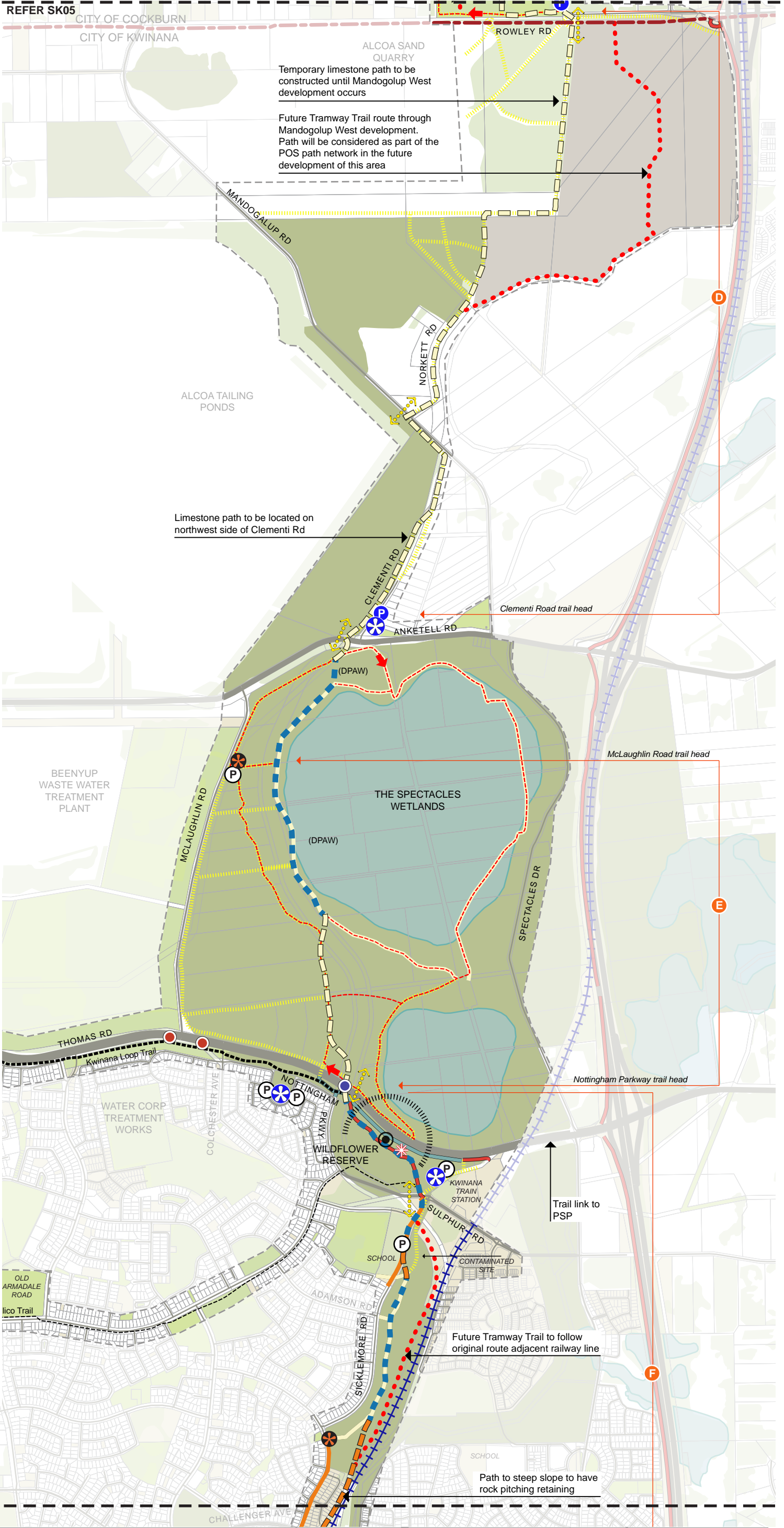
- EXISTING**
- Trail head
- Road median pedestrian refuge
- Parking
- Underpass
- PROPOSED**
- Trail head
- Road median pedestrian refuge
- Freight railway pedestrian crossing
- Parking
- Primary pedestrian access points
- Future neighbourhood connector roads
- Road intersection pedestrian access points

**TRAILS - LOOP TRAILS & SECTIONS**

- EXISTING**
- Major loop trail
- Minor loop trail
- PROPOSED**
- Trail loop
- Trail section

**Glossary**

- CCW Conservation Category Wetland
- DAA Department of Aboriginal Affairs
- DAFWA Department of Agriculture and Food Western Australia
- DPAW Department of Parks and Wildlife
- LGA Local Government Authority
- RAMSAR Ramsar Convention





**LEGEND**

- LGA boundary
  - Government tenure
  - CCW Wetlands DPAW-017
  - Bush Forever DoP 2014
  - Native vegetation DAFWA 2012
  - Reserves 2005
  - Primary roads
  - Secondary roads
  - Minor roads
  - Railway line
  - Vermin proof fence
  - High point
  - Views
- PROPOSED**
- Development
  - Public open space
  - School

**TRAILS - TRAMWAY TRAIL**

**EXISTING**

- Asphalt red
- Asphalt grey
- Concrete
- Limestone
- Sand
- Mulch

**PROPOSED**

- Route over existing material
- Limestone path
- Concrete path
- Reinforced concrete path
- Future route

**TRAILS - NODES, CROSSINGS**

**EXISTING**

- Trail head
- Road median pedestrian refuge
- Parking
- Underpass

**PROPOSED**

- Trail head
- Road median pedestrian refuge
- Freight railway pedestrian crossing
- Parking
- Primary pedestrian access points
- Future neighbourhood connector roads
- Road intersection pedestrian access points

**TRAILS - LOOP TRAILS & SECTIONS**

**EXISTING**

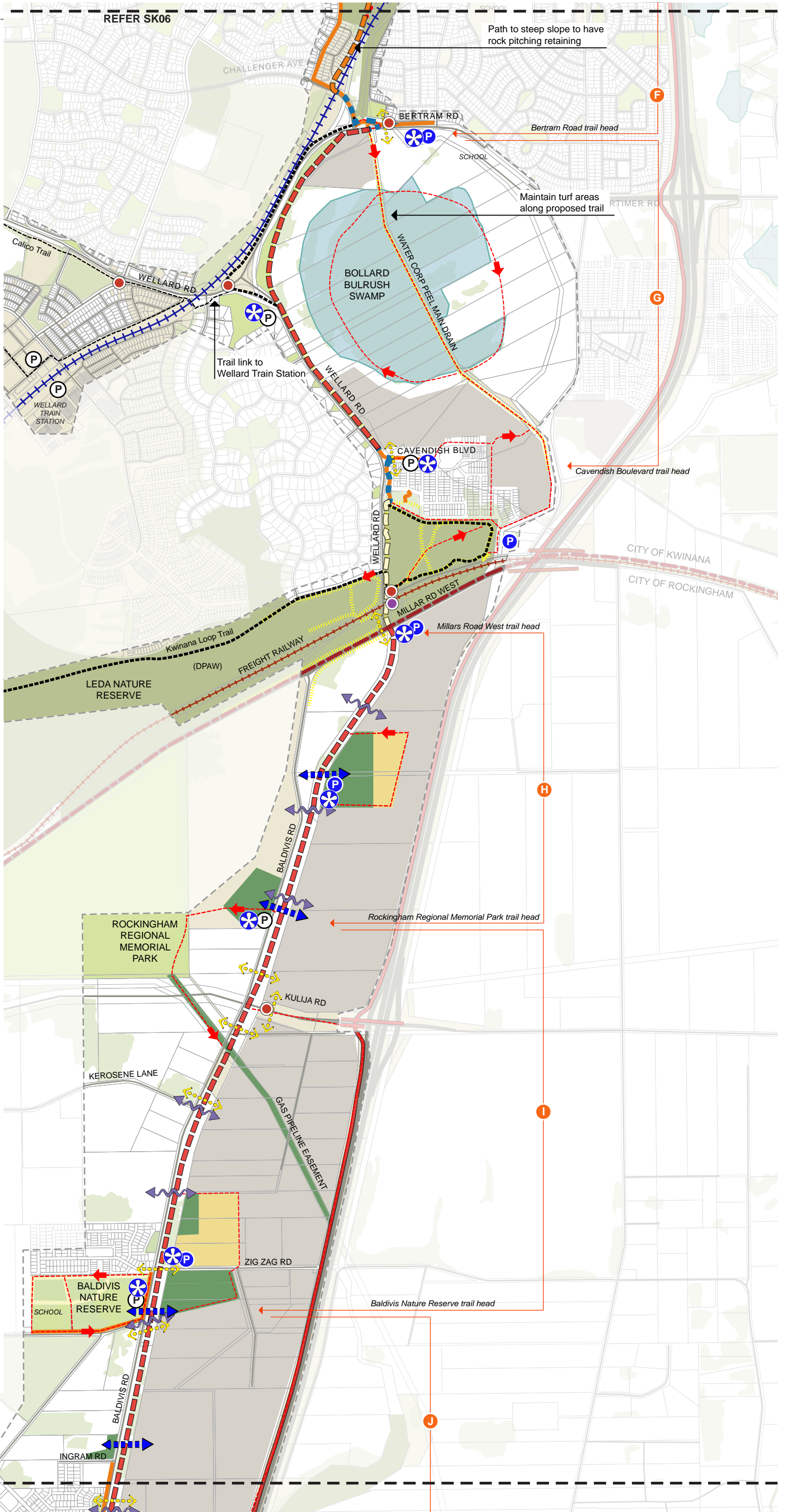
- Major loop trail
- Minor loop trail

**PROPOSED**

- Trail loop
- Trail section

**Glossary**

- CCW Conservation Category Wetland
- DAA Department of Aboriginal Affairs
- DAFWA Department of Agriculture and Food Western Australia
- DPAW Department of Parks and Wildlife
- LGA Local Government Authority
- RAMSAR Ramsar Convention





REFER SK07

**LEGEND**

- LGA boundary
- Government tenure
- CCW Wetlands DPAW-017
- Bush Forever DoP 2014
- Native vegetation DAFWA 2012
- Reserves 2005
- Primary roads
- Secondary roads
- Minor roads
- Railway line
- Vermin proof fence
- High point
- Views
- PROPOSED**
- Development
- Public open space
- School

**TRAILS - TRAMWAY TRAIL**

- EXISTING**
- Asphalt red
- Asphalt grey
- Concrete
- Limestone
- Sand
- Mulch
- PROPOSED**
- Route over existing material
- Limestone path
- Concrete path
- Reinforced concrete path
- Future route

**TRAILS - NODES, CROSSINGS**

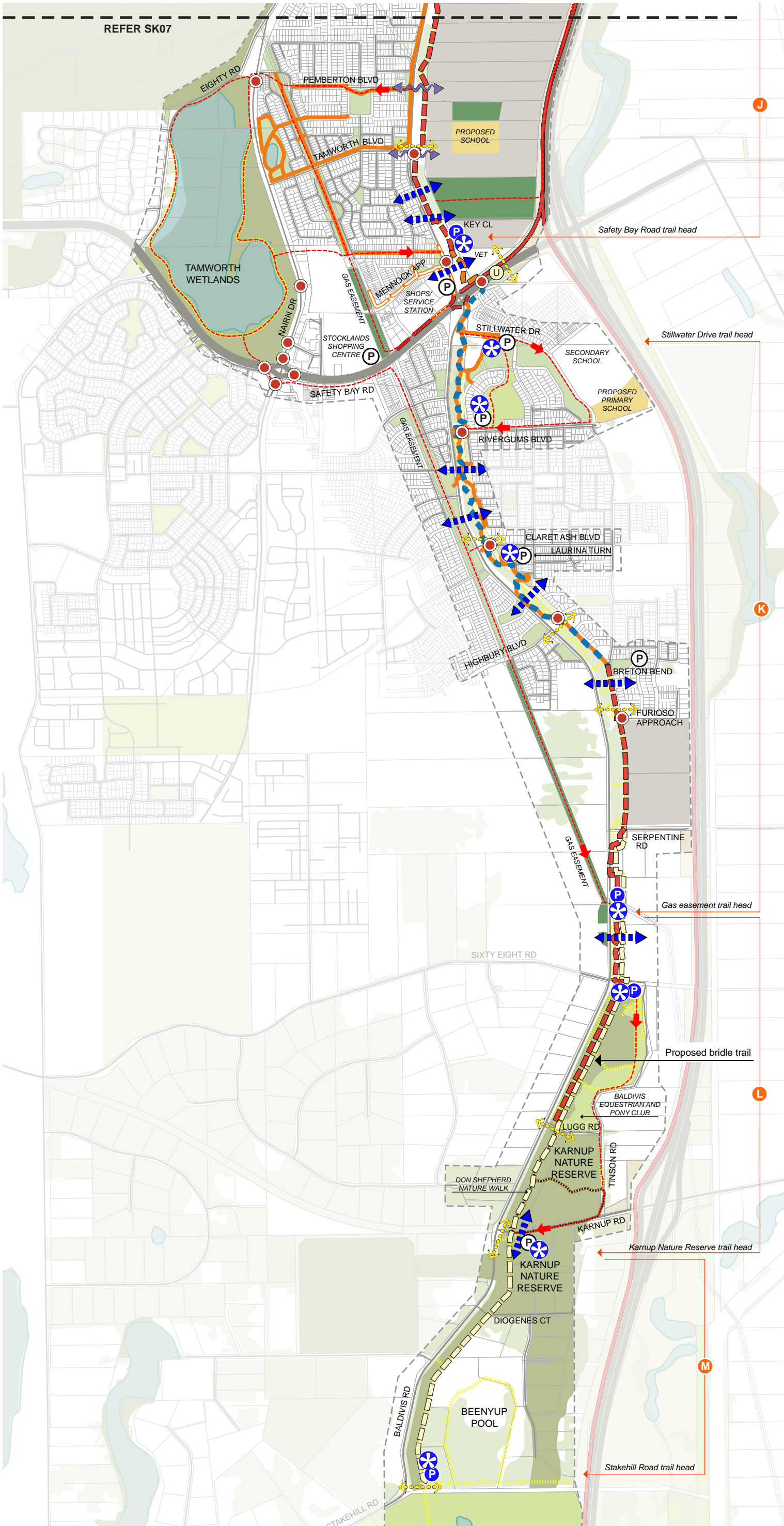
- EXISTING**
- Trail head
- Road median pedestrian refuge
- Parking
- Underpass
- PROPOSED**
- Trail head
- Road median pedestrian refuge
- Freight railway pedestrian crossing
- Parking
- Primary pedestrian access points
- Future neighbourhood connector roads
- Road intersection pedestrian access points

**TRAILS - LOOP TRAILS & SECTIONS**

- EXISTING**
- Major loop trail
- Minor loop trail
- PROPOSED**
- Trail loop
- Trail section

**Glossary**

- CCW Conservation Category Wetland
- DAA Department of Aboriginal Affairs
- DAFWA Department of Agriculture and Food Western Australia
- DPAW Department of Parks and Wildlife
- LGA Local Government Authority
- RAMSAR Ramsar Convention



# APPENDIX F TRAIL COSTS



SITE AREA (sq m): 64,317

SITE RATE (\$/sq m): \$58

PROJECT No:	3238.15
CLIENT:	South west corridor development foundation
STATUS:	Rev C
AUTHOR:	TC
CHECKED:	DK
DATE ISSUED:	30/09/2015



DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT	
<b>CONSTRUCTION - CITY OF COCKBURN</b>					
<b>1 SECTION A</b>				<b>\$71,383</b>	
1.1	Clearing and disposal off site of nominated existing weeds	sq m	1,441	\$5	\$7,203
1.2	Undertaking detailed earthworks to provide level surface for proposed hard surface	sq m	1,441	\$0.50	\$720
1.3	Upgrade sand track to crushed limestone paving (2.5m wide)	sq m	1,441	\$20	\$28,810
1.4	Supply & install Parkes Street trail head (including: information shelter, bins, signage, bike rack etc.)	ps	1	\$15,000	\$15,000
1.5	Supply & install Emmanuel College trail head (including: information shelter, bins, signage, bike rack etc.)	ps	1	\$15,000	\$15,000
1.6	Supply & install interpretation signage	ea	2	\$1,800	\$3,600
1.7	Supply & install directional markers	ea	7	\$150	\$1,050
1.8	Supply & install 10L tree including fertiliser, mulch and stakes	ea	0	\$30	\$0
1.9	Supply & install tubestock (3 plants / m2 )	sq m	0	\$12	\$0
<b>2 SECTION B</b>				<b>\$188,268</b>	
2.1	Clearing and disposal off site of nominated existing weeds	sq m	6,324	\$5	\$31,621
2.2	Undertaking detailed earthworks to provide level surface for proposed hard surface	sq m	6,324	\$0.50	\$3,162
2.3	Upgrade sand track to crushed limestone paving (2.5m wide)	sq m	6,324	\$20	\$126,485
2.4	Supply & install Copolup Lake trail head (including: information shelter, bins, signage, bike rack etc.)	ps	1	\$15,000	\$15,000
2.5	Supply & install interpretation signage	ea	2	\$1,800	\$3,600
2.6	Supply & install directional markers	ea	10	\$150	\$1,500
2.7	Supply & install 10L tree including fertiliser, mulch and stakes	ea	150	\$30	\$4,500
2.8	Supply & install tubestock (3 plants / m2 )	sq m	200	\$12	\$2,400

<b>3 SECTION between B and C across Russell Road</b>					<b>\$46,009</b>
3.1	Clearing and disposal off site of nominated existing weeds	sq m	1,098	\$5	\$5,492
3.2	Undertaking detailed earthworks to provide level surface for proposed hard surface	sq m	1,098	\$0.50	\$549
3.3	Upgrade sand track to crushed limestone paving (2.5m wide)	sq m	1,098	\$20	\$21,968
3.4	Supply & install Copolup Lake trail head (including: information shelter, bins, signage, bike rack etc.)	ps	1	\$15,000	\$15,000
3.5	Supply & install directional markers	ea	6	\$150	\$900
3.6	Supply & install 10L tree including fertiliser, mulch and stakes	ea	30	\$30	\$900
3.7	Supply & install tubestock (3 plants / m2 )	sq m	100	\$12	\$1,200
<b>4 SECTION C</b>					<b>\$280,937</b>
4.1	Clearing and disposal off site of nominated existing weeds	sq m	4,905	\$5	\$24,526
4.2	Undertaking detailed earthworks to provide level surface for proposed hard surface	sq m	4,905	\$0.50	\$2,453
4.3	Upgrade sand track to crushed limestone paving (2.5m wide)	sq m	1,670	\$20	\$33,408
4.4	Upgrade sand track to concrete paving (2.5m wide)	sq m	3,235	\$60	\$194,090
4.5	Supply & install Roper Boulevard trail head (including: information shelter, bins, signage, bike rack etc.)	ps	1	\$15,000	\$15,000
4.6	Supply & install trail head to future development (including: information shelter, bins, signage, bike rack etc.)	ps	1	\$60	\$60
4.7	Supply & install interpretation signage	ea	2	\$1,800	\$3,600
4.8	Supply & install directional markers	ea	6	\$150	\$900
4.9	Supply & install 10L tree including fertiliser, mulch and stakes	ea	150	\$30	\$4,500
4.10	Supply & install tubestock (3 plants / m2 )	sq m	200	\$12	\$2,400
<b>5 ANNUAL MAINTENANCE</b>					<b>\$20,953</b>
5.1	Annual Maintenance Trail heads (including weed control)	sq m	600	\$0.50	\$300
5.2	Annual Maintenance along Trail (including weed control)	sq m	41,305	\$0.50	\$20,653
<b>SUB-TOTAL CITY OF COCKBURN (excluding GST)</b>					<b>\$607,550</b>



CONSTRUCTION - CITY OF KWINANA

6 SECTION D						\$272,750
6.1	Clearing and disposal off site of nominated existing site vegetation	sq m	9,549	\$5	\$47,745	
6.2	Undertaking detailed earthworks to provide level surface for proposed hard surface	sq m	9,549	\$0.50	\$4,775	
6.3	Upgrade sand track to crushed limestone paving (2.5m wide)	sq m	9,549	\$20	\$190,980	
6.5	Supply & install Clementi Road trail head (including: information shelter, bins, signage, bike rack etc.)	ps	1	\$15,000	\$15,000	
6.6	Supply & install interpretation signage	ea	1	\$1,800	\$1,800	
6.7	Supply & install directional markers	ea	9	\$150	\$1,350	
6.8	Supply & install 10L tree including fertiliser, mulch and stakes	ea	250	\$30	\$7,500	
6.9	Supply & install tubestock (3 plants / m2 )	sq m	300	\$12	\$3,600	
7 SECTION between D and E across Anketell Road						\$19,165
7.1	Clearing and disposal off site of nominated existing site vegetation	sq m	640	\$5	\$3,199	
7.2	Undertaking detailed earthworks to provide level surface for proposed hard surface	sq m	640	\$0.50	\$320	
7.3	Upgrade sand track to crushed limestone paving (2.5m wide)	sq m	640	\$20	\$12,796	
7.4	Supply & install directional markers	ea	5	\$150	\$750	
7.5	Supply & install 10L tree including fertiliser, mulch and stakes	ea	30	\$30	\$900	
7.6	Supply & install tubestock (3 plants / m2 )	sq m	100	\$12	\$1,200	
8 SECTION E						\$93,966
8.1	Clearing and disposal off site of nominated existing site vegetation	sq m	2,220	\$5	\$11,101	
8.2	Undertaking detailed earthworks to provide level surface for proposed hard surface	sq m	2,220	\$0.50	\$1,110	
8.3	Upgrade sand track to crushed limestone paving (2.5m wide)	sq m	2,220	\$20	\$44,405	
8.4	Supply & install McLaughlin Road trail head (including: information shelter, bins, signage, bike rack etc.)	ps	1	\$15,000	\$15,000	
8.5	Supply & install Nottingham Parkway trail head (including: information shelter, bins, signage, bike rack etc.)	ps	1	\$15,000	\$15,000	
8.6	Supply & install interpretation signage	ea	2	\$1,800	\$3,600	
8.7	Supply & install directional markers	ea	7	\$150	\$1,050	
8.8	Supply & install 10L tree including fertiliser, mulch and stakes	ea	50	\$30	\$1,500	
8.9	Supply & install tubestock (3 plants / m2 )	sq m	100	\$12	\$1,200	

<b>9 SECTION F</b>					<b>\$47,373</b>
9.1	Clearing and disposal off site of nominated existing site vegetation	sq m	311	\$5	\$1,553
9.2	Undertaking detailed earthworks to provide level surface for proposed hard surface	sq m	311	\$0.50	\$155
9.3	Upgrade sand track to crushed limestone paving (2.5m wide)	sq m	236	\$20	\$4,714
9.4	Upgrade sand track to concrete paving (2.5m wide)	sq m	75	\$60	\$4,500
9.5	Supply & install Kwinana Train Station trail head (including: information shelter, bins, signage, bike rack etc.)	ps	1	\$15,000	\$15,000
9.6	Supply & install Bertram Road trail head (including: information shelter, bins, signage, bike rack etc.)	ps	1	\$15,000	\$15,000
9.7	Supply & install interpretation signage	ea	2	\$1,800	\$3,600
9.8	Supply & install directional markers	ea	19	\$150	\$2,850
9.9	Supply & install 10L tree including fertiliser, mulch and stakes	ea	0	\$0.50	\$0
9.10	Supply & install tubestock (3 plants / m2 )	sq m	0	\$0	\$0
<b>10 SECTION G</b>					<b>\$493,960</b>
10.1	Clearing and disposal off site of nominated existing site vegetation	sq m	5,325	\$20	\$106,501
10.2	Undertaking detailed earthworks to provide level surface for proposed hard surface	sq m	5,325	\$0.50	\$2,663
10.3	Upgrade sand track to reinforced concrete paving (2.5m wide)	sq m	5,325	\$70	\$372,754
10.4	Supply & install Cavendish Boulevard trail head (including: information shelter, bins, signage, bike rack etc.)	ps	1	\$30	\$30
10.5	Supply & install interpretation signage	ea	1	\$12	\$12
10.6	Supply & install directional markers	ea	6	\$150	\$900
10.7	Supply & install 10L tree including fertiliser, mulch and stakes	ea	250	\$30	\$7,500
10.8	Supply & install tubestock (3 plants / m2 )	sq m	300	\$12	\$3,600
<b>11 SECTION between G and H across Millar Road West</b>					<b>\$45,424</b>
11.1	Clearing and disposal off site of nominated existing site vegetation	sq m	1,652	\$5	\$8,260
11.2	Undertaking detailed earthworks to provide level surface for proposed hard surface	sq m	1,652	\$0.50	\$826
11.3	Upgrade sand track to crushed limestone paving (2.5m wide)	sq m	1,652	\$20	\$33,038
11.4	Supply & install directional markers	ea	8	\$150	\$1,200
11.5	Supply & install 10L tree including fertiliser, mulch and stakes	ea	30	\$30	\$900
11.6	Supply & install tubestock (3 plants / m2 )	sq m	100	\$12	\$1,200
<b>12 ANNUAL MAINTENANCE</b>					<b>\$10,448</b>
12.1	Annual Maintenance Trail heads (including weed control)	sq m	1,200	\$0.50	\$600
12.2	Annual Maintenance along Trail (including weed control)	sq m	19,697	\$0.50	\$9,848
<b>SUB-TOTAL CITY OF KWINANA (excluding GST)</b>					<b>\$983,086</b>



**CONSTRUCTION - CITY OF ROCKINGHAM**

<b>13 SECTION H</b>						<b>\$358,422</b>
13.1	Clearing and disposal off site of nominated existing site vegetation	sq m	4,203	\$5	\$21,015	
13.2	Undertaking detailed earthworks to provide level surface for proposed hard surface	sq m	4,203	\$0.50	\$2,101	
13.3	Supply & install reinforced concrete paving (2.5m wide)	sq m	4,203	\$70	\$294,206	
13.4	Supply & install Millars Road West trail head (including: information shelter, bins, signage, bike rack etc.)	ps	1	\$15,000	\$15,000	
13.5	Supply & install Rockingham Regional Memorial Park trail head (including: information shelter, bins, signage, bike rack etc.)	ps	1	\$15,000	\$15,000	
13.6	Supply & install interpretation signage	ea	2	\$1,800	\$3,600	
13.7	Supply & install directional markers	ea	4	\$150	\$600	
13.8	Supply & install 10L tree including fertiliser, mulch and stakes	ea	150	\$30	\$4,500	
13.9	Supply & install tubestock (3 plants / m2 )	sq m	200	\$12	\$2,400	
<b>14 SECTION I</b>						<b>\$421,025</b>
14.1	Clearing and disposal off site of nominated existing site vegetation	sq m	5,249	\$5	\$26,243	
14.2	Undertaking detailed earthworks to provide level surface for proposed hard surface	sq m	5,249	\$0.50	\$2,624	
14.3	Supply & install reinforced concrete paving (2.5m wide)	sq m	5,249	\$70	\$367,407	
14.4	Supply & install Baldivis Nature Reserve trail head (including: information shelter, bins, signage, bike rack etc.)	ps	1	\$15,000	\$15,000	
14.5	Supply & install interpretation signage	ea	1	\$1,800	\$1,800	
14.6	Supply & install directional markers	ea	7	\$150	\$1,050	
14.7	Supply & install 10L tree including fertiliser, mulch and stakes	ea	150	\$30	\$4,500	
14.8	Supply & install tubestock (3 plants / m2 )	sq m	200	\$12	\$2,400	
<b>15 SECTION J</b>						<b>\$508,237</b>
15.1	Clearing and disposal off site of nominated existing site vegetation	sq m	6,404	\$5	\$32,019	
15.2	Undertaking detailed earthworks to provide level surface for proposed hard surface	sq m	6,404	\$0.50	\$3,202	
15.3	Supply & install reinforced concrete paving (2.5m wide)	sq m	6,404	\$70	\$448,266	
15.4	Supply & install Safety Bay Road trail head (including: information shelter, bins, signage, bike rack etc.)	ps	1	\$15,000	\$15,000	
15.5	Supply & install interpretation signage	ea	1	\$1,800	\$1,800	
15.6	Supply & install directional markers	ea	7	\$150	\$1,050	
15.7	Supply & install 10L tree including fertiliser, mulch and stakes	ea	150	\$30	\$4,500	
15.8	Supply & install tubestock (3 plants / m2 )	sq m	200	\$12	\$2,400	

<b>16 SECTION between J and K across Safety Bay Road</b>					<b>\$47,720</b>
16.1	Clearing and disposal off site of nominated existing site vegetation	sq m	678	\$5	\$3,391
16.2	Undertaking detailed earthworks to provide level surface for proposed hard surface	sq m	678	\$0.50	\$339
16.3	Supply & install concrete paving (2.5m wide)	sq m	678	\$60	\$40,690
16.4	Supply & install directional markers	ea	8	\$150	\$1,200
16.5	Supply & install 10L tree including fertiliser, mulch and stakes	ea	30	\$30	\$900
16.6	Supply & install tubestock (3 plants / m2 )	sq m	100	\$12	\$1,200
<b>17 SECTION K</b>					<b>\$300,415</b>
17.1	Clearing and disposal off site of nominated existing site vegetation	sq m	4,164	\$5	\$20,818
17.2	Undertaking detailed earthworks to provide level surface for proposed hard surface	sq m	4,164	\$0.50	\$2,082
17.3	Upgrade sand track to crushed limestone paving (2.5m wide)	sq m	1,080	\$20	\$21,593
17.4	Upgrade sand track to reinforced concrete paving (2.5m wide)	sq m	3,084	\$70	\$215,873
17.5	Supply & install Stillwater Drive trail head (including: information shelter, bins, signage, bike rack etc.)	ps	1	\$15,000	\$15,000
17.6	Supply & install Gas easement trail head (including: information shelter, bins, signage, bike rack etc.)	ps	1	\$15,000	\$15,000
17.7	Supply & install interpretation signage	ea	2	\$1,800	\$3,600
17.8	Supply & install directional markers	ea	7	\$150	\$1,050
17.9	Supply & install 10L tree including fertiliser, mulch and stakes	ea	100	\$30	\$3,000
17.10	Supply & install tubestock (3 plants / m2 )	sq m	200	\$12	\$2,400



18 SECTION L					\$386,776
18.1	Clearing and disposal off site of nominated existing site vegetation	sq m	7,908	\$5	\$39,538
18.2	Undertaking detailed earthworks to provide level surface for proposed hard surface	sq m	7,908	\$0.50	\$3,954
18.3	Upgrade sand track to crushed limestone paving (2.5m wide)	sq m	4,775	\$20	\$95,500
18.4	Upgrade sand track to reinforced concrete paving (2.5m wide)	sq m	3,133	\$70	\$219,284
18.5	Supply & install Karnup Nature Reserve trail head (including: information shelter, bins, signage, bike rack etc.)	ps	1	\$15,000	\$15,000
18.6	Supply & install interpretation signage	ea	1	\$1,800	\$1,800
18.7	Supply & install directional markers	ea	4	\$150	\$600
18.8	Supply & install 10L tree including fertiliser, mulch and stakes	ea	250	\$30	\$7,500
18.9	Supply & install tubestock (3 plants / m2 )	sq m	300	\$12	\$3,600
19 SECTION M					\$81,600
19.1	Clearing and disposal off site of nominated existing site vegetation	sq m	2,247	\$5	\$11,235
19.2	Undertaking detailed earthworks to provide level surface for proposed hard surface	sq m	2,247	\$0.50	\$1,124
19.3	Upgrade sand track to crushed limestone paving (2.5m wide)	sq m	2,247	\$20	\$44,941
19.4	Supply & install Stakehill Road trail head (including: information shelter, bins, signage, bike rack etc.)	ps	1	\$15,000	\$15,000
19.5	Supply & install interpretation signage	ea	1	\$1,800	\$1,800
19.6	Supply & install directional markers	ea	4	\$150	\$600
19.7	Supply & install 10L tree including fertiliser, mulch and stakes	ea	150	\$30	\$4,500
19.8	Supply & install tubestock (3 plants / m2 )	sq m	200	\$12	\$2,400
20 ANNUAL MAINTENANCE					\$16,226
20.1	Annual Maintenance Trail heads (including weed control)	sq m	1,600	\$0.50	\$800
20.2	Annual Maintenance along Trail (including weed control)	sq m	30,852	\$0.50	\$15,426
<b>SUB-TOTAL CITY OF ROCKINGHAM (excluding GST)</b>					<b>\$2,120,421</b>

<b>21 OTHER</b>					<b>\$29,450</b>
21.1	Signage Strategy including interpretive signage, trail head and signage design	ps	1	\$15,000	\$15,000
21.2	Trail brand design	ps	1	\$10,000	\$10,000
21.3	Trail branding - design and brand guidelines	ps	1	\$3,500	\$3,500
21.4	Trail branding - promotional posters A3	ea	200	\$1.25	\$250
21.5	Trail branding - Trail Maps, folded A3 to A6, full colour	ea	500	\$1.40	\$700
<b>TOTAL ALL LGA'S (Local Government Authorities) - excluding GST</b>					<b>\$3,740,507</b>
GST					\$374,051
<b>TOTAL ALL LGA'S - including GST</b>					<b>\$4,114,557</b>

NOTE: This OPC does not include for any civil works, stormwater, irrigation bore or major headworks, major structural items or consultation fees.

NOTE: Quantities and rates above are subject to change based on detailed design and documentation of the works and is an 'opinion' only.



# APPENDIX G TRAIL STRATEGIES MAP

# PATH TYPOLOGIES



Future development

- Concrete paths to be reinforced for emergency and maintenance access



Existing urban

- Tramway Trail to utilise existing concrete and asphalt paths
- More shade trees



Public open space

- Concrete and asphalt paths to complement existing



Bushland/urban fringe

- 3 metre wide limestone paths or concrete which can function as firebreak
- No asphalt which can become damaged during fire
- Screen fences



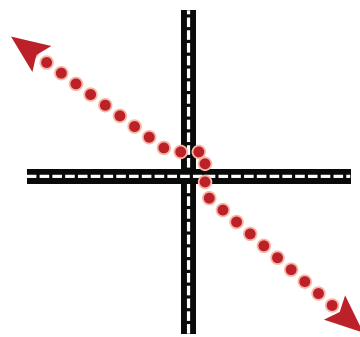
Bushland

- Natural materials eg compacted limestone
- Concrete path to complement existing sections

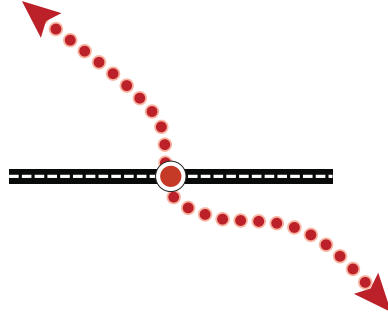


# ROAD CROSSING

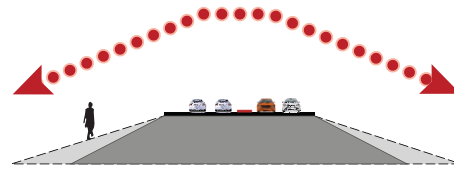
Note : Further traffic study recommended for major road crossings



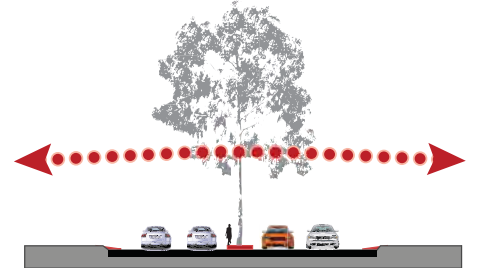
Cross at intersection



Existing pedestrian refuge



Regrade batter



Pedestrianise street



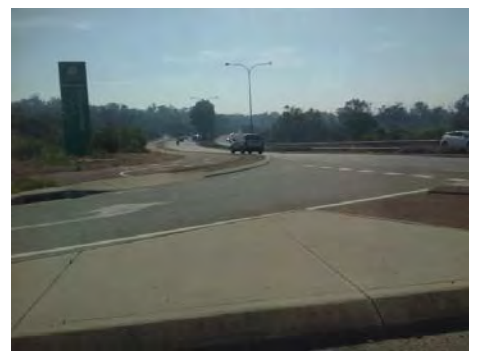
Paved surface



Pedestrian refuge



Issue - Safety bay road



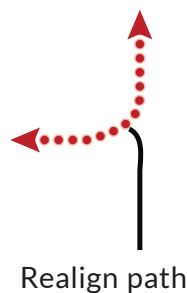
Issue - Thomas road

# WAYFINDING STRATEGIES & SIGNAGE



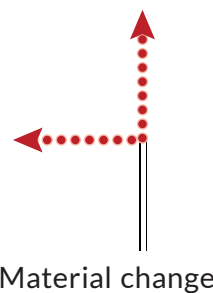
Tramways Route

Secondary Path



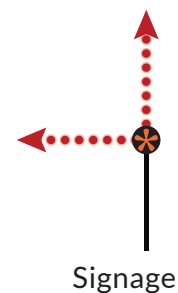
Realign path

TYPE A



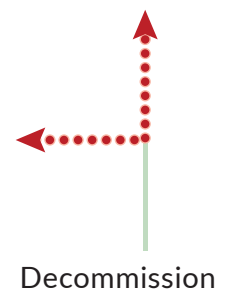
Material change

TYPE B



Signage

TYPE C



Decommission

TYPE D



# APPENDIX H TRAIL MARKETING MAP

## EVENTS

Organise events which use the tramways trail



Rockingham - Kwinana relay for life (Charity running)



City to Surf (Linking destinations)



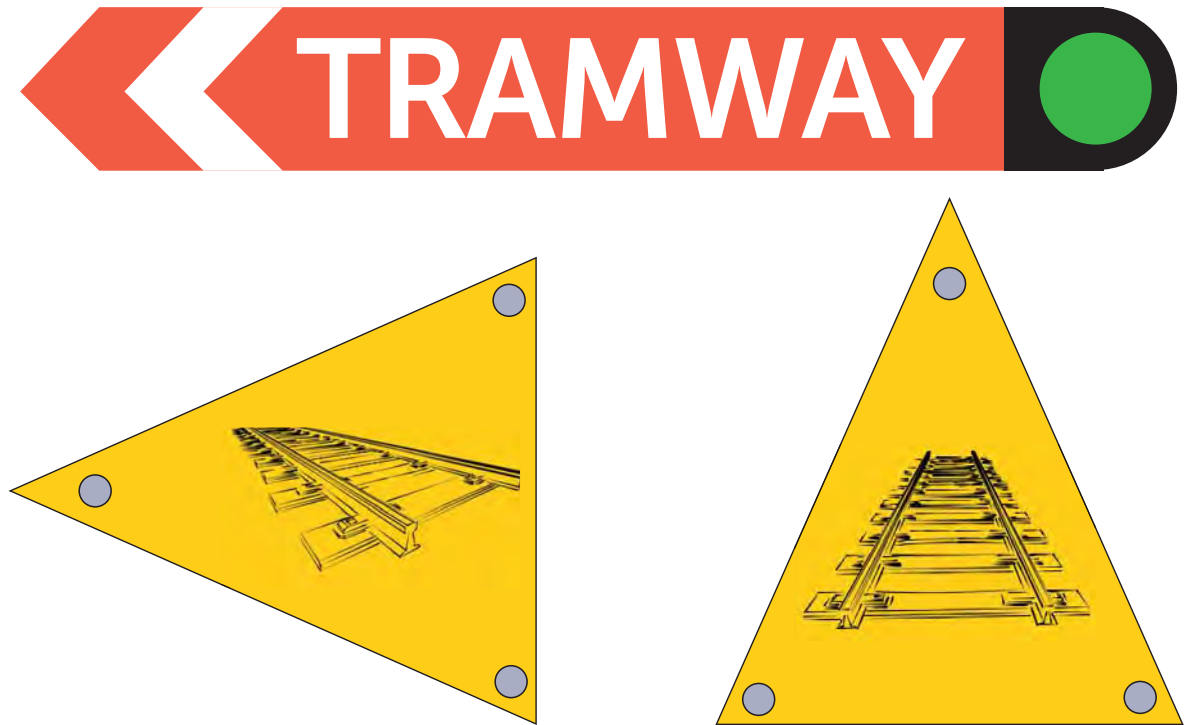
3 Great Rides (Charity cycling)

**NOTE:** Due to pedestrians requiring crossing at major intersections along the Tramways Trail, organised events will require careful planning to ensure users safety.

Train stations could be used as car drop-off areas and event starting points, then users would commute via train back to car parking area eg between

## INTERACTIVE DIGITAL AND BRANDING

Use the internet as a marketing device and create a brand identity



## LINK PLACES AND DIGITAL MEDIA

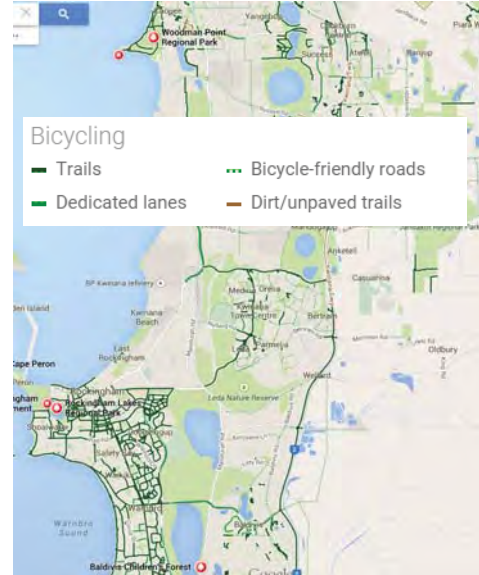
Link to existing trail loops and key nodes use the internet as a marketing device



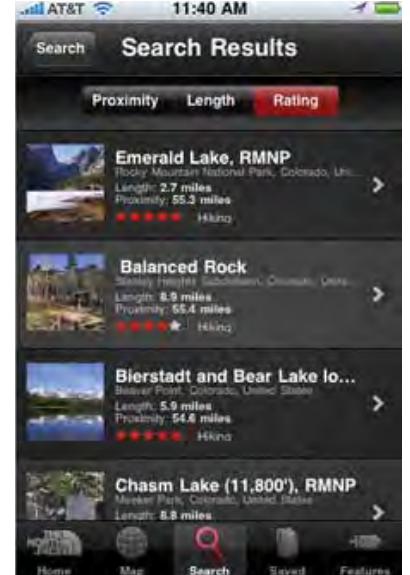
Link to schools and workplaces



Link to 'friends of' volunteers



Google maps cycle / walking network



Create an application



## APPENDIX I FUNDING

### Trailswest (Department of Sport and Recreation) - Lotterywest Funding

The Trailswest mission is to facilitate an integrated network of trails throughout WA for recreation, conservation, education and tourism, and to preserve trail/transport corridors for the future. They provide an integrated consultative link between and local government agencies and the community to develop a statewide recreational trail network.

Lotterywest provides up to \$500,000 per year in grants for trail development in Western Australia. These grants are managed through a grant round in partnership with the Department of Sport and Recreation.

The types of trails projects supported include:

- the preparation of a plan for a trail
- the conversion of disused railways into recreational trails
- the upgrading of existing trails
- the construction of a trail for non-motorised uses, such as walking, hiking, mountain biking, canoeing or horse riding
- interpretive and directional signposting along a trail
- promotion, publicity, trail guides and maps
- special trail events (trail openings etc).

All applications are assessed by Lotterywest and a Trails Grants Assessment Panel, involving the Department of Sport and Recreation.

Contact for more information:

Website: <http://www.dsr.wa.gov.au/funding/trails>

Website: <http://www.lotterywest.wa.gov.au/grants>

### Lotterywest - Interpretation of Cultural Heritage

Interpretation of Cultural Heritage Grants aim to help communities to develop an understanding of the significance of their cultural heritage places and objects, as a way of maintaining their sense of identity and heritage. The total budget available for this grant area is limited. \$15,000 is usually the maximum amount that can be granted to any one project.

Contact for more information:

Website: <http://www.lotterywest.wa.gov.au/grants>

### Indigenous Heritage Program

The Indigenous Heritage Program (IHP) is an Australian Government initiative that supports projects that identify, conserve and promote the Indigenous heritage values of places important to Aboriginal and Torres Strait Islander people.

Individual project funding for organisations will in general be available up to a maximum of \$100,000 (GST inclusive). Individual applicants will generally be eligible for funding up to \$5000. Applications for more than these amounts may be considered where the applicant demonstrates special circumstances or a genuine requirement for additional funds.

Contact for more information:

Website: <http://www.environment.gov.au/heritage/grants-funding/indigenous-heritage-programme>

### **Perth Bicycle Network**

The Perth Bicycle Network is a series of cycling routes comprising of on-road, path and end-of-trip infrastructure. The PBN is coordinated by the Department of Transport and forms part of a strategic and integrated transport network being developed for our city, during this time of incredible growth.

The majority of the network belongs to Local Government, and grant funding can be obtained for local cycling infrastructure (or network planning) through the Department of Transport's PBN Grants Program.

Contact for more information:

Website: <http://www.transport.wa.gov.au/activetransport/25722.asp>

### **National Trust (WA)**

The National Trust has the ability to establish and manage a public tax deductible appeal to raise funds.

Contact for more information:

Website: <http://www.nationaltrust.org.au/western-australia>

### **Corporate Sponsors**

Sponsorship from non-government organisations plays a big role in the development of community amenities and facilities. This type of funding can be sought locally or nationally to attract big corporate sponsorship. Potential corporate sponsors could include:

- agricultural industries
- developers
- local businesses
- mining industries.

### **Potential Resources**

There are a number of resources available to contribute to the implementation of the trails network including:

- Green Army
- Community volunteers
- Community groups and Associations
- Department of Parks and Wildlife
- Conservation Volunteers Australia.