

# JARRAHDALÉ BRIDLE TRAIL DEVELOPMENT TRAIL CONCEPT PLAN AND REPORT



Department of Biodiversity,  
Conservation and Attractions



## Acknowledgement of Country

Tredwell Management, the Department of Biodiversity, Conservation and Attractions and the Shire of Serpentine Jarrahdale acknowledge the traditional custodians of the region, the Noongar people. We pay our respects to elders past, present, and future.

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## Document Control

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# Executive Summary



## 00 Executive Summary

The Jarrahdale Bridle Trail Concept Plan has been developed by Tredwell Management for the Department of Biodiversity, Conservation and Attractions (DBCA) and the Shire of Serpentine Jarrahdale (SJ).

The Project Area is located approximately 1km north of the historical town of Jarrahdale, within the Shire of SJ in the outer south-eastern metropolitan area of Perth. The Shire of SJ is the fastest growing local government within Western Australia, and is renowned for its extensive equine industry that supports trail riding, tourism and attracts people to the region for events.

Jarrahdale has been identified as a development zone and a nationally significant location for an equine trails network. The Shire of SJ is advocating and demonstrating the case for Jarrahdale to become an accredited Trail Town, building on Jarrahdale's strengths of current trail offerings, community led development and a unique positioning that offers a trail destination less than a one hour drive from central Perth.

The existing Jarrahdale Bridle Trail is not fit for purpose, and the current alignment is no longer suitable due to land tenure implications associated with a recently established mining lease. There is demonstrated need and opportunity to create a new, more sustainable and best-practice, bridle trail, supporting the region's existing equine industry and contributing to the region's potential as a nationally significant equestrian location.

Development of the trail concept plan has been in line with the 8 Stage Trail Development Process and guidelines which apply to sustainable trail development. The trail system design is based on the findings of the background document review, site assessment, and stakeholder consultation.

The concept presents the opportunity to develop a stacked loop trail system with the primary trailhead located at the Jarrahdale Oval. This site is controlled by the Shire of SJ and has been strategically identified in various planning documents for its potential as a regional trailhead.

The proposed trail network will attract local and regional users, appealing to those seeking family and leisure focused recreation in a natural setting. The key trails within the network are Trail 1 (5km 'easy' loop trail) and Trail 2 (20km 'intermediate' loop trail with an optional 3.8km loop extension).

The trail corridors have been selected to capitalise on areas of attractive bushland and scenic views, and to minimise road crossings; impacts on natural and cultural values, trail user conflict and long term maintenance requirements.

The concept highlights the opportunities for strategic trail linkages to the north (to the Admiral Road South Float Parking Area), the south (to Jarrahdale township, RV Park and Heritage Mill Site) and west (along the proposed Mundijong to Jarrahdale Rail Trail). Connectivity to the east is constrained due to restrictions which apply to Public Drinking Water Source Areas (PDWSA).

The trails will be suitable for horse trail riding and trail running, with potential to attract events in these disciplines. The primary target markets are the 'leisure' and 'enthusiast' segments, while secondary target markets are the 'sport' and 'independent' trail users.

The Order of Probable Costs has estimated construction of the concept plan to cost \$2.117M. This includes the key and optional components specified for:

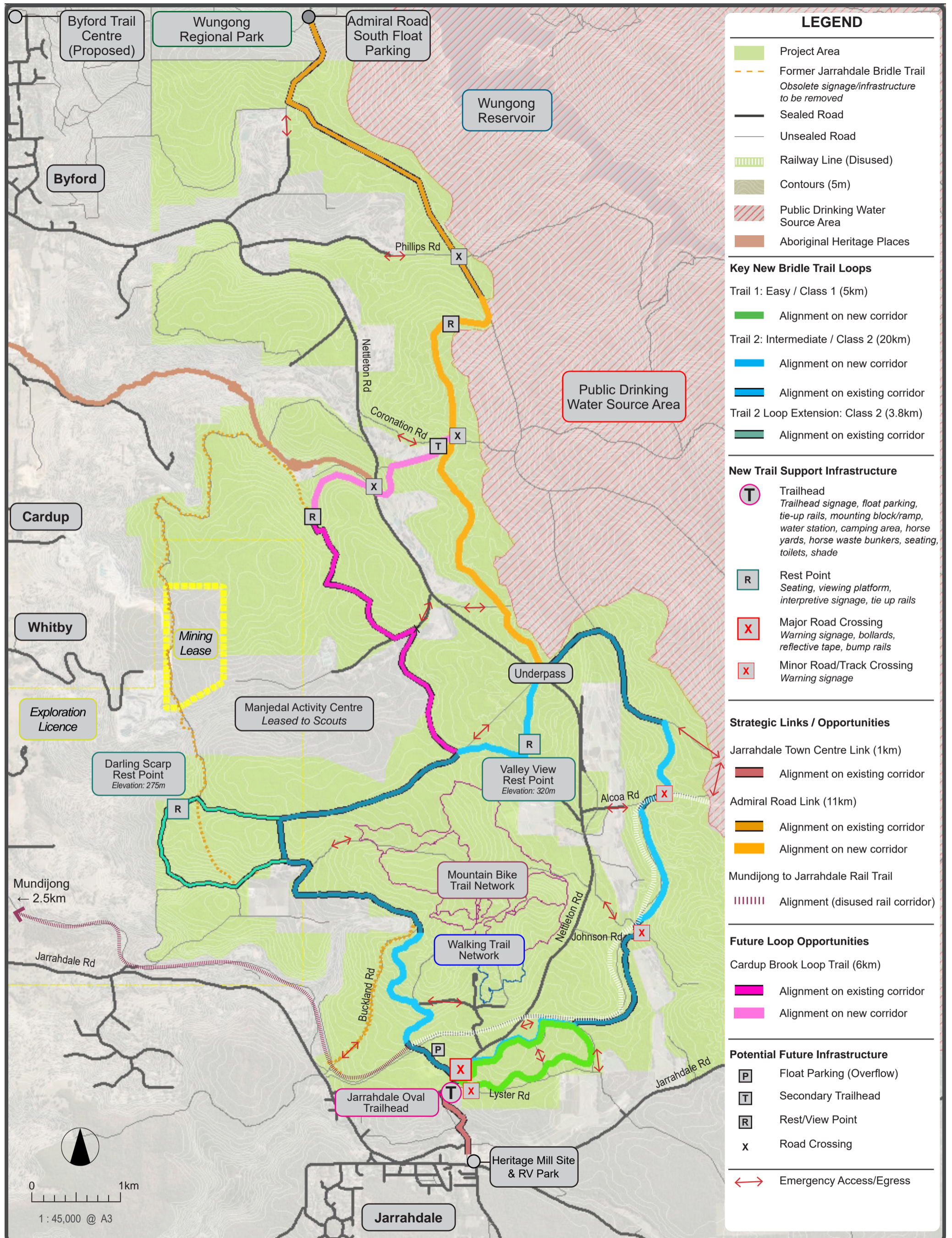
- Jarrahdale Oval Primary Trailhead (\$763,728),
- Trail 1/Easy Loop (\$526,579),
- Trail 2/Intermediate Loop (\$813,125), and
- Removal of obsolete signage associated with the former Jarrahdale Bridle Trail (\$13,568).

To guide progress in line with the 8 Stage Trail Development Process, recommended next steps are outlined under the following categories:

- Planning and Design;
- Construction;
- Management and Activation;
- Monitoring and Evaluation.

The annual estimated usage of the Jarrahdale Bridle Trail has been calculated to be approximately 31,200 based on participation and visitation data, and potential event registrations.

## Concept Plan



### LEGEND

- Project Area
- Former Jarrahdale Bridle Trail  
*Obsolete signage/infrastructure to be removed*
- Sealed Road
- Unsealed Road
- Railway Line (Disused)
- Contours (5m)
- Public Drinking Water Source Area
- Aboriginal Heritage Places

### Key New Bridle Trail Loops

Trail 1: Easy / Class 1 (5km)

Alignment on new corridor

Trail 2: Intermediate / Class 2 (20km)

Alignment on new corridor

Alignment on existing corridor

Trail 2 Loop Extension: Class 2 (3.8km)

Alignment on existing corridor

### New Trail Support Infrastructure

**T** Trailhead  
*Trailhead signage, float parking, tie-up rails, mounting block/ramp, water station, camping area, horse yards, horse waste bunkers, seating, toilets, shade*

**R** Rest Point  
*Seating, viewing platform, interpretive signage, tie up rails*

**X** Major Road Crossing  
*Warning signage, bollards, reflective tape, bump rails*

**x** Minor Road/Track Crossing  
*Warning signage*

### Strategic Links / Opportunities

Jarrahdale Town Centre Link (1km)

Alignment on existing corridor

Admiral Road Link (11km)

Alignment on existing corridor

Alignment on new corridor

Mundijong to Jarrahdale Rail Trail

Alignment (disused rail corridor)

### Future Loop Opportunities

Cardup Brook Loop Trail (6km)

Alignment on existing corridor

Alignment on new corridor

### Potential Future Infrastructure

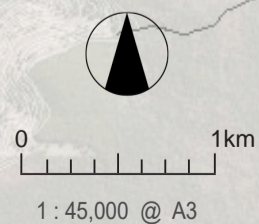
**P** Float Parking (Overflow)

**T** Secondary Trailhead

**R** Rest/View Point

**x** Road Crossing

Emergency Access/Egress



01

# Introduction and Context



# 01 Introduction and Context

## Project Background

The *Peel Regional Trails Strategy* (2019) has identified Jarrahdale for its potential as a nationally significant location for equine trails. Jarrahdale is within close proximity to a growing population and contains high scenic quality, which gives this location significant potential for equine trails.

Horse riding is a recreational activity that has strong cultural and heritage associations for many West Australians. It is a popular and enjoyable way to experience natural environments.

The *Western Australia Recreational Horse Trails Strategy "Taking the Reins"* (2015) identified the need for easily accessible trails. One of the recommended priorities for trail access was the need for linkages, loops and connections of existing trails that create a cohesive riding experience of one to four hours.

Tredwell Management has been engaged to assist the Department of Biodiversity, Conservation and Attractions (DBCA) and the Shire of Serpentine Jarrahdale (SJ) in the development of a concept plan for a new Jarrahdale Bridle Trail. The DBCA is the state government agency responsible for managing Western Australia's national parks, marine parks, state forests and other reserves, conserving wildlife and providing opportunities for enjoyment of parks. This includes management of the Jarrahdale State Forest and Langford Park, and the recreational trails located on this estate. The project area is located within the Shire of SJ and adjacent to the Jarrahdale Oval which is managed by the Shire.

The existing Jarrahdale Bridle Trail (also known as the Langford Park Bridle Trail) provides a riding experience of approximately 20-25 kilometres, along management tracks. This route is promoted online (e.g. Trails WA website), has an associated printed brochure, and trail markers exist on the ground. The existing trail and associated signage is not fit for purpose, and the current alignment is no longer suitable due to land tenure implications associated with a recently established mining lease.



Image: Existing promotional material

There is demonstrated need and opportunity to create a new, more sustainable bridle trail in the Project Area, supporting the region's existing equine industry and contributing to the region's potential as a nationally significant equestrian location.

## Aims

As outlined in the project brief, the key aims of this project are to:

- Explore opportunities for link and loop trails to cater for local and regional users.
- Develop half to full day loop options for family and leisure focused recreation.
- Identify potential alignments for trails classified as easy (green) and moderate (blue).
- Develop high quality horse trail riding experiences within the Project Area.
- Provide recommendations for high-quality trails that encounter minimal road crossings through attractive bush and potential points of interest.
- Reduce long term maintenance through the development of sustainable trails, minimising impact on natural and cultural assets.
- Develop trails that are suitable for trail running and consider using these for trail events.

Connectivity with Jarrahdale Oval is noted as an additional aim, as identified with the Steering Group. Jarrahdale Oval has been identified in numerous planning documents for its suitability as a trailhead for bridle trails within Jarrahdale State Forest, as well as an equine events space (e.g. *Shire of SJ Local Trail Plan* (2019)). The Shire of SJ has demonstrated initiative towards this with the preparation of the *Trail Development Business Case* (2020) which details this opportunity. The Shire is also progressing with plans to develop a more formal concept for enhancement of this site.



# 01 Introduction and Context

## Scope and Approach

The project scope is to:

- Develop a new bridle trail network consisting of:
  - One long loop of approximately 20 kilometres classified as blue (intermediate/class 2).
  - One short loop of approximately 5 kilometres classified as green (easy/class 1). This trail should connect to the blue trail and can potentially share green sections of the blue trail.
- Provide opportunity to pilot the new bridle trail classifications and signage as part of the implementation of the *Western Australian Recreational Horse Trail Strategy (2015)*.
- Develop the trail in line with the 8 Stage Trail Development Process, including the framework and concept plan.
- Utilise management tracks only for short links to the broader network and where they provide a positive experience, including visual and grade.
- Assess existing trails that meet the concept brief during concept planning, and include these where appropriate.
- Ensure trails are a sympathetic fit within the natural landscape with a focus on natural features.
- Protect waterways and areas of high conservation and cultural values.

- Ensure the Project Area remains outside of the water supply area and mine development areas.
- Ensure trail development fits within the environment and is not visually obtrusive by implementing best practice planning, design and construction standards.
- Locate and manage safe crossing points (trail and vehicle tracks).
- Consider areas for parking and emergency access.
- Recommend associated infrastructure by type and location.

The project has been developed using the following four stage approach:

1. Project Start Up and Background Research
2. Site Appraisal and Consultation
3. Draft Concept Design
4. Final Concept Plan and Associated Report

## Project Steering Group

The Project Steering Group includes the following organisations:

- Department of Biodiversity, Conservation and Attractions (DBCA)
- Shire of Serpentine Jarrahdale (SJ)
- Australian Trail Horse Riders Association (ATHRA)
- Department of Local Government, Sport and Cultural Industries (DLGSC)
- Shire of SJ Equine Advisory Group
- SJ Equine Advisory Group

# 01 Introduction and Context

## Project Area

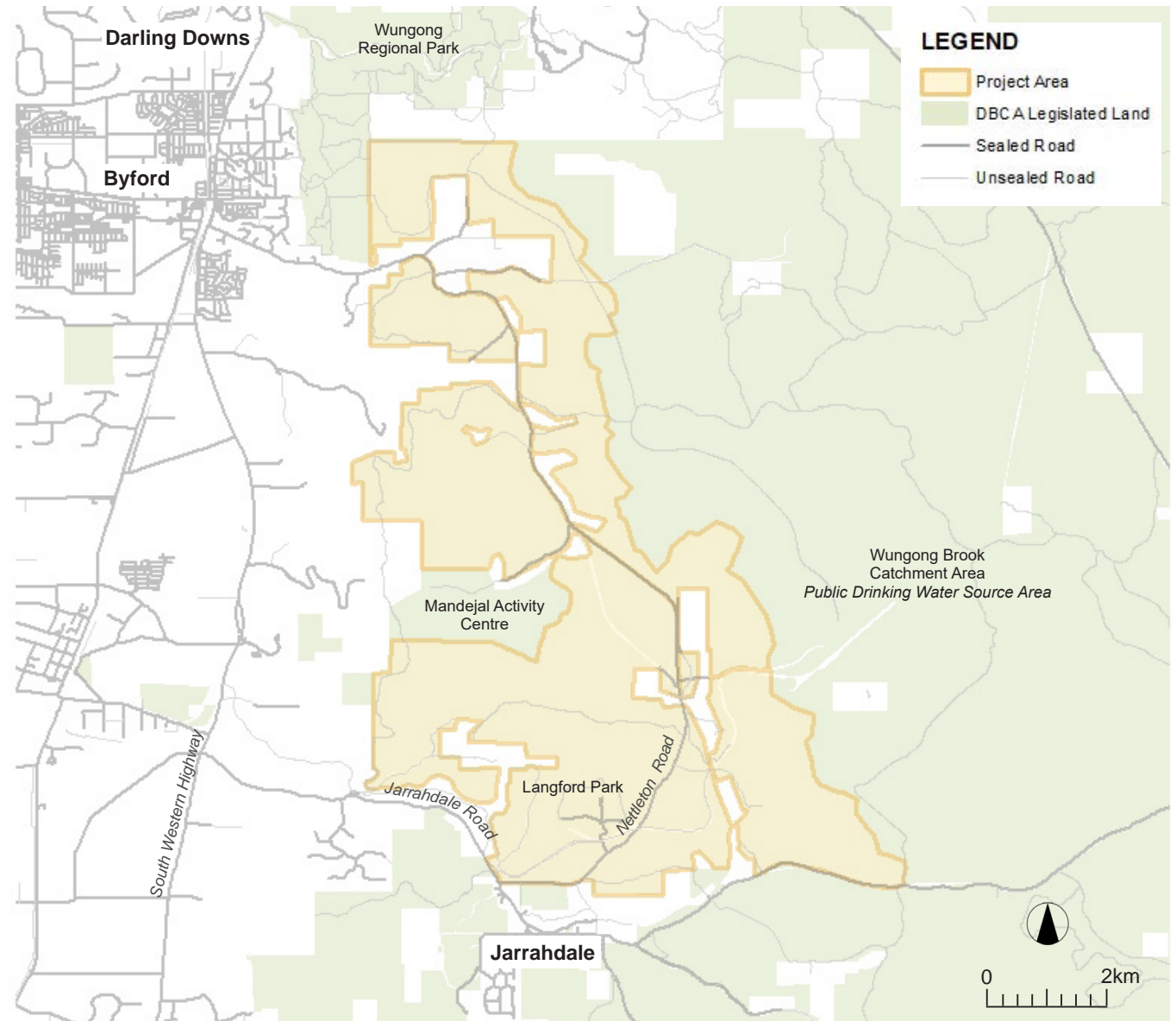
The Project Area is within Jarrahdale State Forest, located 54 kilometers from the Perth Central Business District and 1km north of Jarrahdale. It is located east of the South Western Highway, north of Jarrahdale Road, south of Wungong Regional Park and west of the Wungong Brook Catchment Area which is a public drinking water source area (PDWSA).

Nettleton Road traverses through the Project Area and is a public road linking Jarrahdale Road at its south western extent, to the South Western Highway at its north western extent.

Langford Park is within the Project Area. This area has been extensively replanted and landscaped following the closure of bauxite mining operations in the early 1970's. It is now used for public recreation including bushwalking, mountain bike riding and horse riding.

The Project Area comprises of jarrah and marri trees with an understorey of banksia, balga, casuarina and many spring flowering plants. Several small creeks seasonally flow west to where there are views across the farmlands of the coastal plain and south over the expanse of forest.

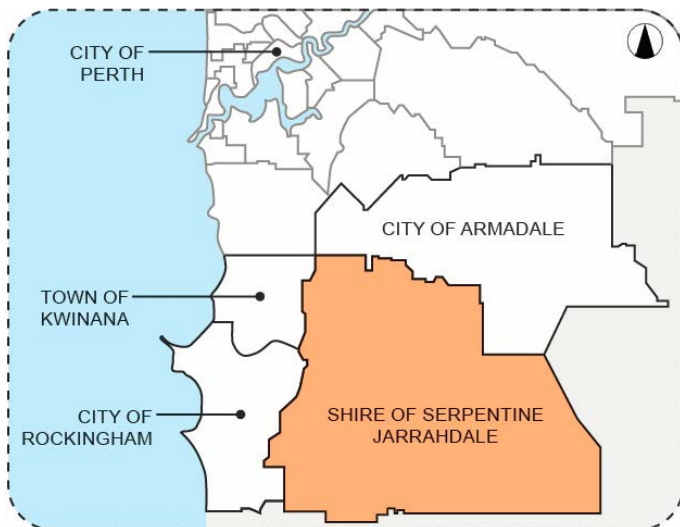
Mandejal Activity Centre is an outdoor recreation facility located adjacent to the Project Area, and is leased from DBCA to Scouts.



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## Regional Overview

The Project Area is located within the Shire of SJ. As shown in the map below, the Shire is located in the outer south-eastern metropolitan area of Perth.



The Shire of SJ is the fastest growing local government within Western Australia (WA). Its population is predicted to grow exponentially from 36,403 in 2021 to 68,335 in 2036 (average increase of 5.85% per annum). The region boasts a relatively young age demographic, with the average age of residents being 32 years. The highest growth age cohort in the next five years is predicted to be in the 20-29 age group (increase of 2,289 people).

This rapid increase in population, as well as trends toward individualised and nature-based activities, will require substantial development of the region's trail network to cater for residents and to capitalise on tourism and local employment opportunities.

The Shire of SJ is renowned for its extensive equine industry that supports trail riding, tourism and attracts people to the region for events. As outlined in the *Shire of SJ Equine Strategy* (2018), the local community have a long-standing and rich history of equine culture. Currently, there are over 8,000 horses and 80 equine businesses within the Shire. The region's equine industry has over 190 employees and volunteers, with equine customers reaching 2,800 per week. Annual equine expenditure retained in the Shire equates to \$168 million. A wide range of equestrian establishments exist across the region, including training facilities, racecourses, riding schools, equine suppliers, vets/health professionals, farriers, breeders, agistment centres and equine tourism/rides.

According to a survey conducted as part of the *Shire of SJ Equine Strategy* (2018), irrespective of whether the activity is registered or unregistered, trail riding is the most popular of all equine activities (62%), followed by recreational riding (54%) and dressage (35%). This survey also found that the Darling Downs Trail Network is the most frequently used equine trail facility (56%), followed by the Jarrahdale Trails and Oakford Trails Network North (24% respectively). The preferred riding distance among survey respondents is between six and ten kilometres.

The Shire of SJ is advocating and demonstrating the case for Jarrahdale to become an accredited Trail Town, building on Jarrahdale's strengths of current trail offerings (including equine trails), community led development and a unique positioning that offers a trail destination less than a one hour drive from central Perth. This has been demonstrated through the development of the following documents:

- *Jarrahdale Trail Town Business Case* (2021),
- *Shire of SJ Equine Strategy* (2018),
- *Draft Shire of SJ Equine Trails Master Plan* (2021), and
- *Shire of SJ Trail Development Business Case* (2020).

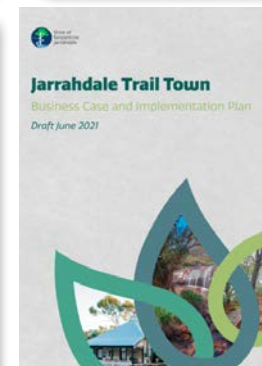
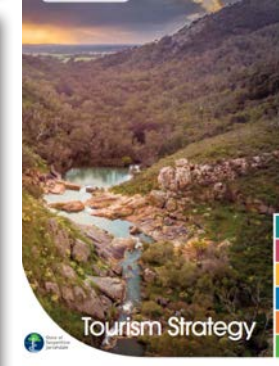
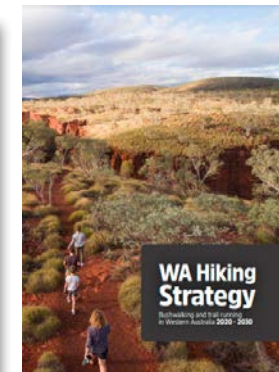
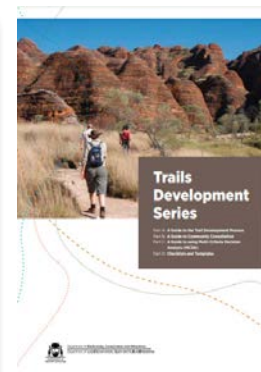
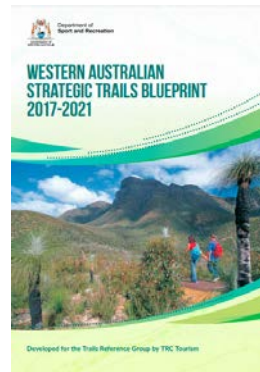
# 01 Introduction and Context

## Strategic Context

A wide range of strategies and planning documents at state, regional and local levels demonstrate the need and strategic context surrounding the development of the Jarrahdale Bridle Trail. These documents have been reviewed to inform the project:

- *WA Strategic Trails Blueprint 2017 – 2021*
- *WA Trail Development Series* (2019)
- *WA Recreational Horse Trail Strategy* (2015)
- *WA Hiking Strategy 2020 – 2030*
- *WA Mountain Bike Management Guidelines* (2019)
- *WA Forest Management Plan 2014-2023*
- *Peel Regional Trails Strategy* (2019)
- *Peel Equine Strategy* (2017)
- *Shire of SJ Tourism Strategy 2018-2023*
- *Shire of SJ Equine Strategy* (2018)
- *Shire of SJ Draft Equine Trails Master Plan* (2021)
- *Jarrahdale Trail Town Business Case and Implementation Plan* (2021)
- *Shire of SJ Trail Development Business Case* (2020)
- *Shire of SJ Shire Multiple Use Trails Policy* (2018).

Key details of each document are outlined in Appendix 1: Background Review.



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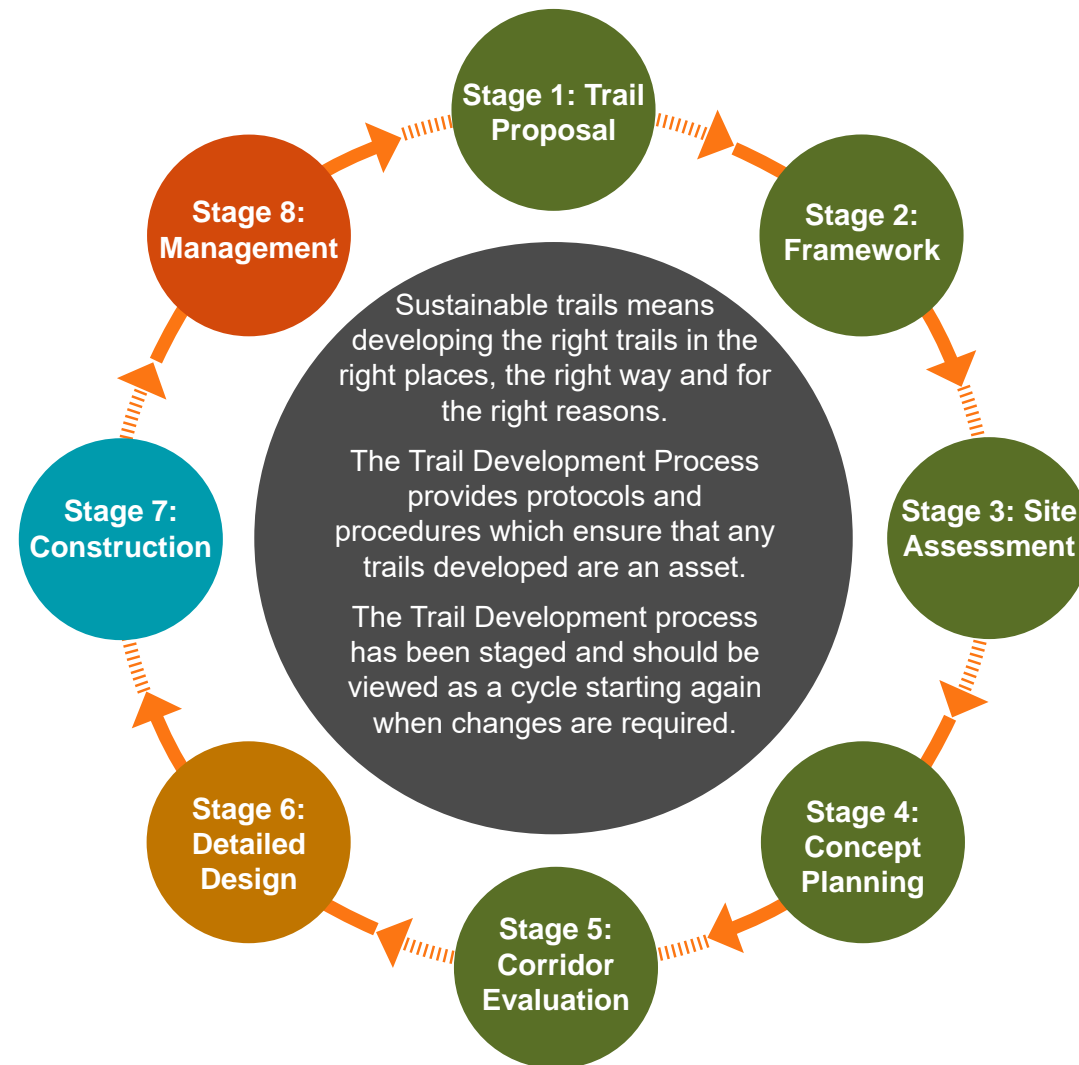
## 8 Stage Trail Development Process

A robust trail development process moves trail development away from a purely design and construction approach to a more considered and planned approach.

The following figure displays the 8 Stage Trail Development Process. Each stage of the process is outlined in the *WA Trails Development Series* (2019). Working within this standardised methodology is the expectation for all trails across Western Australia (WA).

The Jarrahdale Bridle Trail Development Concept Plan incorporates Stages 1-4. As outlined in the Trail Development Process, Concept Planning (Stage 4) is generally based on broad corridors (20m–150m wide). Through the corridor evaluation process (Stage 5), these broad corridors are adjusted and refined based on identified constraints and mitigation strategies.

The 8 Stage Trail Development Process encompasses a constant evaluation, review and improvement process as trails are being developed, maintained, extended or renewed.



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The 8 Stage Trail Development Process and the expected outcomes associated with each stage are outlined in the below table.

Stage	Outcome	
1 <b>Trail Proposal</b>	The proposed area is either supported in principle for trail development, or is not supported due to environmental, social or cultural constraints. The purpose of a proposal could be to identify potential suitable areas for consideration.	Desktop
2 <b>Framework</b>	A project outline, developed by project steering group (stakeholders), including: project objectives, project management model, stakeholder roles, target market, requirements, standards, execution, and ongoing trail management model.	
3 <b>Site Assessment</b>	Undertake a broad scale study of the area and identify constraints, soil types, vegetation etc.	
4 <b>Concept Planning</b>	Identify opportunities and conceptual trail plan including infrastructure requirements produced. Broad trail corridors are physically flagged in the field.	
5 <b>Corridor Evaluation</b>	Detailed assessment of trail corridors for use in determining the final trail alignment.	Field
6 <b>Detailed Design</b>	Detailed trail design produced and physically flagged in the field, including: trail classifications, technical trail features, construction types and specifications.	
7 <b>Construction</b>	Trail is constructed in line with the detailed design.	
8 <b>Management</b>	Management plan implemented detailing maintenance and monitoring requirements.	

Source: *WA Trails Development Series* (2019)

# 01 Introduction and Context

## WA Horse Trail Classifications

The Horse Trail Classification System has been developed by ATHRA and is included in the *WA Recreational Horse Trail Strategy (2015)*. The system has been reviewed by the WA Trails Reference Group and endorsed by the WA Trails Steering Committee.




The Horse Trail Classifications are used across Australia to provide guidelines for trail users and assist them to make an informed decision before setting out on a trail. This information can:

- Encourage users to choose and make use of trails that match their ability level.
- Help ensure that trail users have an experience that meets their expectations.
- Manage risk and assist to minimise discomfort or injury to trail users.
- Assist in trail promotion.

This system classifies horse trails into the following categories: Class 1 - easy (green); Class 2 - intermediate (blue); Class 3 - advanced (black).

A summary and description of the key attributes of the horse trail classifications are provided in the following tables.

As noted in the *WA Hiking Strategy 2020-2030*, trail running does not have a separate grading system in Western Australia and therefore the Walking Tracks Classification System (AS2156.1) is applicable to trail running trails (Graded 1-6).

	<b>Class 1</b> <b>Easy - Green</b>	Wide, consistent surface and width of trail, gentle slope. For riders and horses with basic skills and fitness.
	<b>Class 2</b> <b>Intermediate - Blue</b>	Variable trail with narrow sections and uneven surfaces, moderate slope, some obstacles. For riders and horses with moderate skills and fitness.
	<b>Class 3</b> <b>Advanced - Black</b>	Challenging trail, with extended sections of narrow and uneven surfaces, reduced corridor height, many obstacles and steep sections. For riders and horses with high skill and fitness level.

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	Easy (Class 1)	Intermediate (Class 2)	Difficult (Class 3)
<b>Description</b>	<p>Most suitable for novices, social groups and others seeking a relatively short distance trail requiring a basic level of skill and horse and rider fitness.</p> <p>Most likely to be fire roads or wide single tracks (bridle paths) with a gentle grade (not exceeding 10%) and a relatively obstacle free, hardened natural surface.</p> <p>Likely to be shared-use and frequent encounters with other users including cyclists, walkers and runners can be expected.</p>	<p>Most suitable for individuals and smaller social groups seeking a short to medium distance trail requiring a moderate level of skill and fitness.</p> <p>Most likely to be a combination single trail and/or fire road with obstacles, variable surfaces, and a moderate slope.</p> <p>Likely to be shared-use so encounters with other users including cyclists, walkers, runners and horse riders should be expected.</p>	<p>Suitable for individuals and small social groups seeking a very challenging trail requiring a high level of skill, fitness, and basic navigation skills.</p> <p>Most likely to consist of challenging single trail and/or fire road with many obstacles, variable surface, and steep sections. Some trail routes may not be marked at all.</p> <p>May possibly be shared-use so encounters with other users possibly including cyclists, walkers, vehicles and other stock should be expected, however, many of these trails may be located in remote areas and encounters with others is expected to be minimal.</p>
<b>Trail Surface</b>	<p>Generally a natural surface (topped with dolomite or compacted surface if desired).</p> <p>Hardened surfaces such as concrete or asphalt to be avoided due to concussion on horse legs and poor traction with metal horseshoes.</p> <p>Hardened surfaces may be utilised on rail trails or other tracks where horses would generally only walk.</p>	<p>Generally a natural surface is desired and may include sections of rocky ground, sand, clay or gravel.</p> <p>Obstacles such as rocks, logs and gates that require dismounting are likely. Shallow ford crossings are acceptable (note: rainfall conditions vary widely and seasonal conditions may alter water depths significantly).</p>	<p>Usually a variable surface with sections of rock, sand, clay gravel, etc. Obstacles may include challenging rocks, logs, fording creeks.</p>
<b>Trail Width</b>	<p>Minimum tread: 1500mm</p> <p>Note: Short sections of narrower tread (.60m to 1.2m) are acceptable at ground level, 1.5m is required at the height of the riders' stirrups.</p> <p>Minimum corridor width: 3000mm</p> <p>Minimum height: 3700mm</p>	<p>Minimum tread: 1500mm</p> <p>Minimum clearing: 1500mm</p> <p>Minimum height: 3700mm</p>	<p>Minimum tread: 300mm (1500mm recommended at the height of the riders' stirrups)</p> <p>Minimum clearing: 1500mm</p> <p>Minimum height: 2500mm</p>
<b>Trail Gradient</b>	<p>Desired gradient: 0 – 10% (maximum 10%)</p> <p>Maximum sustained pitch: 5%</p> <p>Maximum out slope: 4%</p>	<p>Maximum gradient: 15%</p> <p>Maximum sustained pitch: 10%</p> <p>Maximum out slope: 4%</p>	<p>Maximum gradient: 20%</p> <p>Maximum sustained pitch: 10%</p>

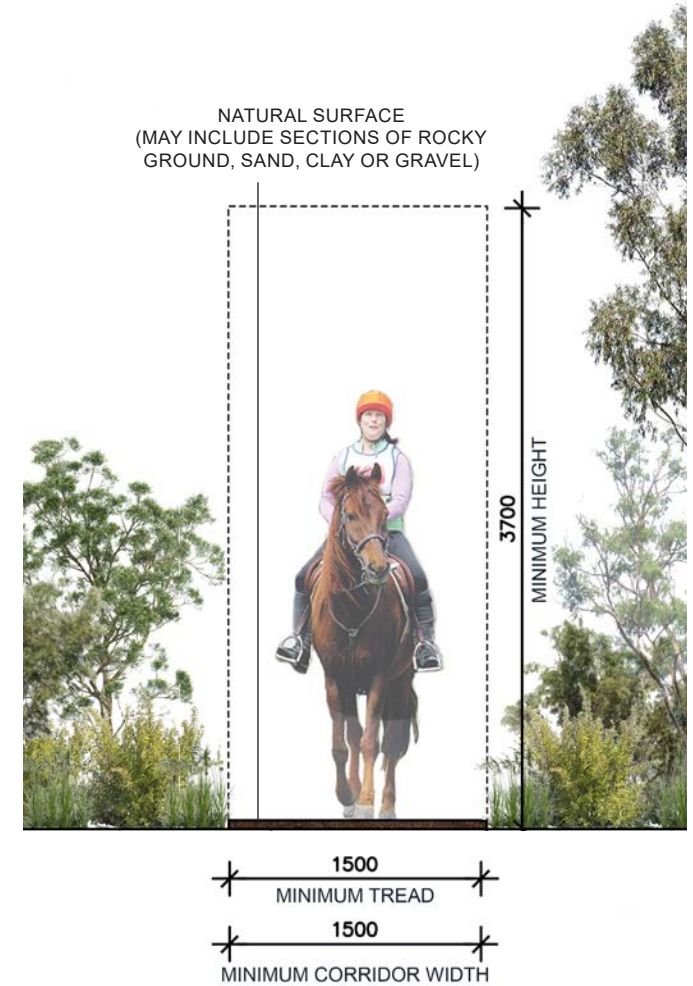
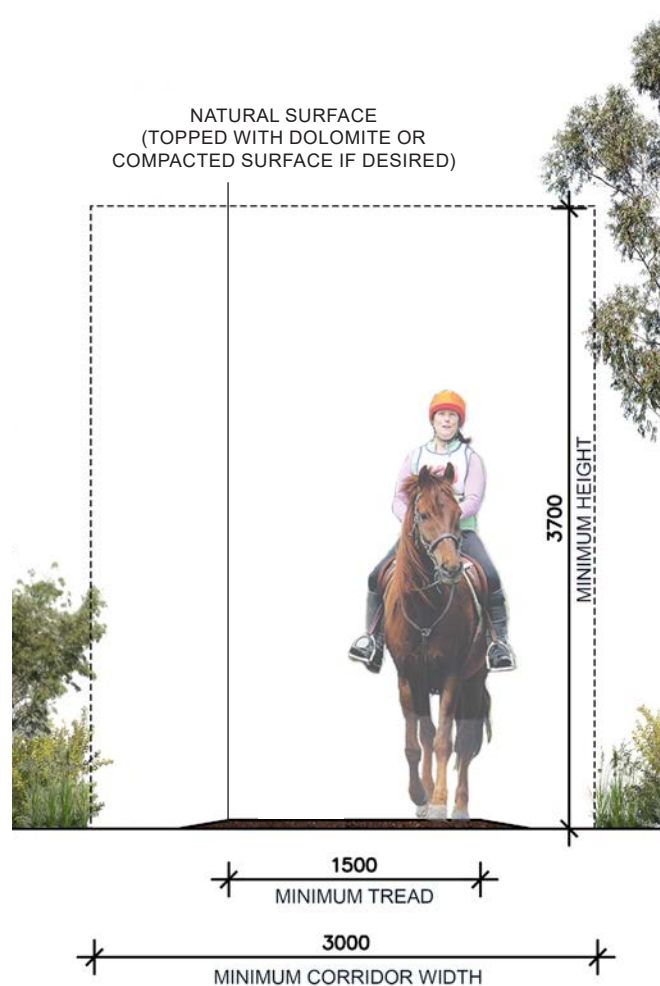


# 01 Introduction and Context

The specifications for Class 1 and Class 2  
bridle trails are shown in the figure to the right.  
These are directly relevant to the scope of the  
Jarrahdale Bridle Trail Concept Plan.

Class 1  
Easy / Green 

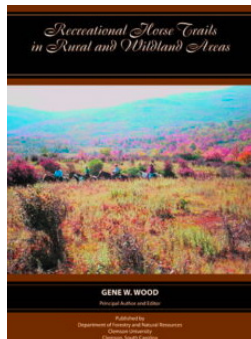
Class 2  
Intermediate / Blue 



# 01 Introduction and Context

## Best Practice Horse Trail Design

The following documents guide best-practice trail planning and design which are relevant to the project. Key relevant information has been included in Appendix 1 Background Review.



The book titled *Recreational Horse Trails in Rural and Wildland Areas* (Wood 2007) provides guidance to land managers and equine trail users relating to the design, construction, and maintenance of horse trails in a manner that harmonises the trail and its use with the rest of the ecosystem and the landscape values.

The following three goals guide all aspects of trail design, construction, and maintenance contained in this book:

- The trail will be user safe
- The trail will be ecologically sound
- The trail will be economically sustainable.

While these guidelines have been developed in an American context, much of the guidance can be applied to horse trails internationally.



The *Horse Trail Infrastructure Guidelines* (2019) have been produced by Horse SA and provide useful information relating to horse trail infrastructure requirements, particularly relating to peri-urban areas. It is noted that the Project Area is not a peri-urban environment, however, relevant some sections of the guidelines are of relevance to the Jarrahdale Bridle Trail.

These guidelines seek to fill the information gap relating to horse specific information in existing technical resources dedicated to trail network planning, design, building and maintenance. There are currently no Australian Standards for horse trail or related infrastructure design.

While these guidelines have been developed in a South Australian context, much of the guidance can be applied to horse trails in WA.



The *WA Mountain Bike Management Guidelines* (2019) provide guidance to ensure a consistent approach to planning, designing, constructing and managing sustainable mountain bike trails across WA.

Many of the principles and tools within the Guidelines can be applied to all types of recreational trails to help meet the needs of users, minimise environmental degradation and ensure long term sustainability.

Sustainable trails meet user's needs, reduce environmental impact and require less maintenance. The way to achieve this is to develop the right trail, in the right area, the right way and for the right reasons.

02

# Site Assessment



## 02 Site Assessment

### Site Assessment Process

The site assessment process allowed for identification of positive attributes (opportunities) and negative attributes (constraints) within the Project Area. This involved both desktop analysis and site visits.

#### Desktop Analysis

Desktop analysis involved collating all available spatial data and overlaying these on the project area. This included analysis of the following geographical information system (GIS) layers:

- Aboriginal heritage places
- Environmentally sensitive areas
- Observed fauna habitat areas
- Topography (5m contours)
- Existing recreational trails
- Project area boundary
- Mining tenements (i.e. mining leases and exploration licenses)
- DBCA managed land
- Public drinking water source area (PDWSA)
- Phytophthora dieback assessments\*
- Roads

The data relating to the occurrence of phytophthora dieback in the project area dates back to 1987. Phytophthora dieback and flora and fauna surveys have not been conducted and are to be included in the corridor evaluation process.

#### Site Visits

Site visits provided the opportunity to:

- Gain an on-ground understanding of the project area, its varying landscapes and existing infrastructure.
- Appreciate the experience offered along the former Jarrahdale Bridle Trail.
- Verify opportunities and constraints which were identified through desktop analysis and consultation.
- Identify additional opportunities and constraints (e.g. topographic features or land use considerations).
- Seek opportunities for the development of the new Jarrahdale Bridle Trail.

Key locations within the Project Area were visited and data spatially recorded using ArcGIS Collector. This process enabled the data and information collected from the field to be transferred onto desktop software for review, interpretation and analysis. This data was then utilised for the preparation of maps.

The following photographs demonstrate some of the key issues, features and opportunities on the existing Jarrahdale Bridle Trail and in other parts of the Project Area.



Jarrahdale Oval - Existing Informal Trailhead



Cleared Area Adjacent to Alcoa Road

## 02 Site Assessment



Wayfinding - Poor Condition



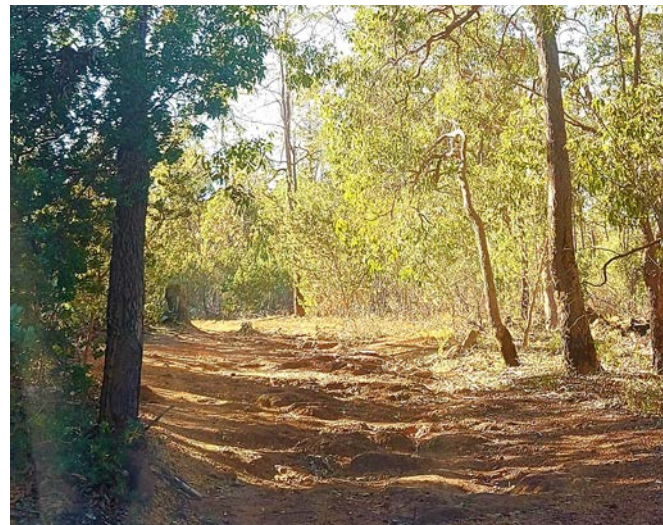
Existing Trail Corridor Along Vehicle Tracks



Cardup Brook - Aboriginal Heritage Place



Lack of Wayfinding at Key Intersections



Existing Trail Corridor Along Vehicle Tracks



Attractive Bushland Setting

## 02 Site Assessment

### Land Use and Tenure

The Project Area is managed by the DBCA. The following land tenures have been identified and considered as they are adjacent to, or overlay, the Project Area. The location of these are illustrated on the Opportunities and Constraints Plan (Chapter 2).

#### Mineral Titles

The following mineral titles have been identified through a Mineral Titles Online search, which provides details of tenements granted across WA.

- **Active Mining Lease (M: 7001240)**  
The adjacent active mining lease for the Bluemetal Whitby Quarry has restricted access along the former Jarrahdale Bridle Trail.  
Air quality and natural aesthetics may be compromised in areas close to the active mine.  
The *Mine Closure Plan M70/1240* (2016) defines the approach to be used for the eventual closing of mining activities at this site. It is noted that the project has an estimated remaining life of mine in excess of 100 years.
- **Exploration License (E: 7004683)**  
An exploration license has been granted over part of the Project Area. This presents a potential future threat to recreational assets on this land. This authorises the licensee to enter and explore the land over which it is granted as well as extract or disturb up to 1,000 tonnes of material from the land. Licenses are granted for five years and may be extended by 5 years and further period(s) of 2 years.

#### Adjacent Land Uses

- **Manjedal Activity Centre**  
The Manjedal Activity Centre is on land leased from DBCA to Scouts. Access is restricted to this area and it is important that bridle trail alignments do not traverse leased land.
- **PDWSA**  
The Wungong Brook Catchment Area is the PDWSA located directly east of the Project Area. Development of new bridle trails is not allowed in the PDWSA. This limits opportunities for strategic connections to the east of the Project Area.
- **Private Land**  
Numerous private properties are adjacent to the Project Area. Private land use presents a potential threat to bridle trails if developed in close proximity to these boundaries (e.g. barking dogs, use of loud machinery, barbed wire fencing etc.).



Manjedal Activity Centre (Scout Lease)



Adjacent Private Land

## 02 Site Assessment

### Topography and Soils

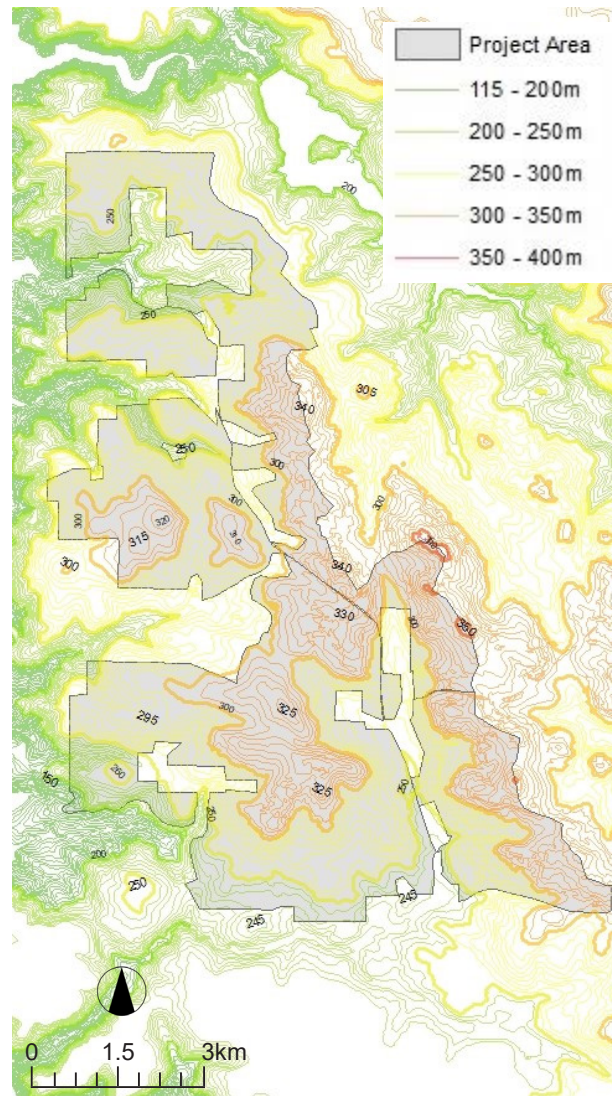
The Project Area exhibits broadly undulating terrain with elevation ranging from 150m to 370 metres above sea level. The central and eastern sections generally feature higher elevations, with the outer northern, western and southern sections featuring lower elevations. The area's smooth slopes are generally less than 5 degrees.

The terrain is generally rocky with gravel tracks and features undulating hills. Multiple small creeks seasonally flow west where there are views across the farmlands to the coastal plain and south to the expanse of forest. The Project Area exhibits the unique character of the jarrah forest in this portion of the Darling Range.

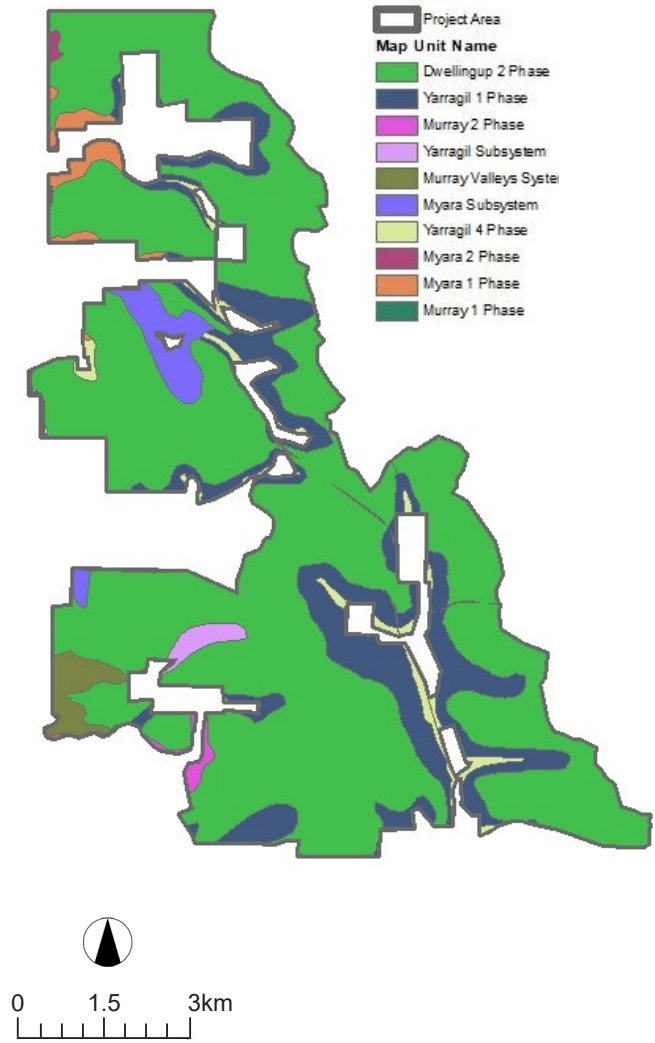
The topographical profile is illustrated on the following map, followed by a map illustrating the 'best available soil data', published by the Department of Primary Industries and Regional Development (2021).

As shown on the Soil Map, the predominant soil type in the Project Area is 'Dwellingup 2 Phase' which is characterised by *very gently to gently undulating terrain (<10%) with well drained, shallow to moderately deep gravelly brownish sands, pale brown sands and earthy sands overlying lateritic duricrust*. These gentle gradients and well drained soils are ideal for sustainable bridle trail development.

All soil types within the Project Area are described in Appendix 2: Soil Types.



Topography Map



Soil Map

## 02 Site Assessment

### Existing Recreational Use

The Project Area offers the former Jarrahdale Bridle Trail, a network of mountain bike trails, and a network of walking trails. The location of these are illustrated on the Opportunities and Constraints Plan (Chapter 2).

#### Jarrahdale Bridle Trail

The former Jarrahdale Bridle Trail is a 26km loop experience. It is marked with wayfinding signage (many markers now missing or in poor condition), and no formal trailhead sign or facilities exist.

The trail is primarily accessed from Jarrahdale Oval or an informal parking area near the intersection of Jarrahdale Road and Buckland Road. The western extent of the trail is currently inaccessible in sections due to the active mining lease, however, informal routes are currently used by some horse riders to traverse past the mining lease. The existing trail alignment includes a short section along land leased to the Scouts of the Mandejal Activity Centre which is no longer suitable for use.

The *Shire of SJ Local Trail Plan (2019)* and Trails WA identify this trail as a 'regional level' trail. Trails WA classifies the trail as 'advanced', suitable for riders with a 'high level of fitness and experience'.



#### Langford Park Mountain Bike Trail Network

The Langford Park Mountain Bike Trail Network is a regional level trail network with experiences varying from 0.5 to 4 kilometres in length. These experiences can be combined to form a 10-12 kilometre loop. The trail network consists of gradual hills and single tracks that are fast and flowing. The trails are generally single track with moderate gradients.

The trailhead is accessed off Nettleton Road (access road across from Jarrahdale Oval) and trailhead infrastructure includes toilets, picnic tables, barbecues and sealed car parking. Trail signage has recently been upgraded.

Intersections between the mountain bike trails and bridle trails would create potential conflict zones and should be avoided.



#### Walking Trails

The walking trails within Langford Park begin at the trailhead near the main car park, toilets and picnic facilities. The three walking trail experiences offered are:

- Ken Jones Trail (60 minute loop)
- Tallow Wood Trail (20 minute loop)
- Wheelchair/Pram Trail (10 minute loop).





## 02 Site Assessment

### Strategic Links

The following strategic links have been identified, which provide opportunity to connect the Jarrahdale Bridle Trail with the broader region's bridle trail network and key facilities. The location of these are illustrated on the Opportunities and Constraints Plan (Chapter 2).

#### South - Millars Road

Millars Road (unsealed) extends south of Jarrahdale Oval, linking to the Heritage Mill Site and RV Park, and to the Jarrahdale Town Centre.



Jarrahdale Heritage Mill



Millars Road

#### North - Admiral Road South

There is opportunity to connect the Jarrahdale Bridle Trail to the existing float parking area on Admiral Road South. This provides potential to link with bridle trails in Wungong Regional Park and to key facilities in Byford (e.g. the proposed Byford Trail Centre). Old Haul Road No. 1 is currently utilised as a key route, however, this route traverses into the PDWSA. Formalising a link between Jarrahdale/Langford Park and Byford/Wungong has been identified as a key strategic opportunity in the *Shire of SJ Draft Equine Trails Master Plan (2021)*.



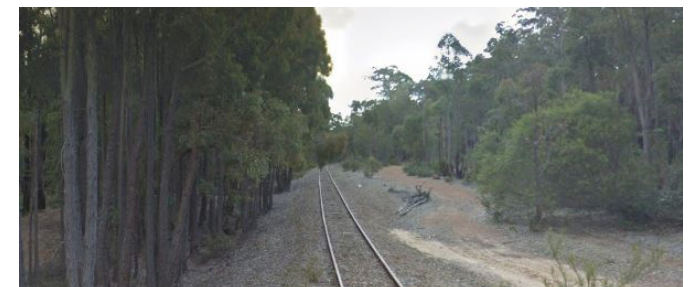
Old Haul Road

#### West - Mundijong to Jarrahdale Rail Trail

The proposed Mundijong to Jarrahdale Rail Trail provides a key strategic link opportunity for horse riders between Langford Park/Jarrahdale and Mundijong. The *Peel Regional Trails Strategy (2019)* recommends investigating and formalising this trail, and the *Shire of SJ Trail Development Business Case (2020)* outlines this opportunity.

#### Nettleton Road Underpass

A key strategic link within the Project Area is the Nettleton Road underpass. This underpass provides uninterrupted connectivity along Old Haul Road No. 3 between the eastern and western sides of Nettleton Road.



Existing Rail Corridor



Existing Nettleton Road Underpass

# 03

# Consultation



## 03 Consultation

### Consultation Process

Consultation has been undertaken with the Project Steering Group and other targeted stakeholders to inform the development of the Jarrahdale Bridle Trail Concept Plan. This process was guided by the Engagement Framework.

The process included:

- Workshops with Project Steering Group:
  - Opportunities/Constraints Workshop on 19 August 2021
  - Preliminary Draft Workshop on 21 October 2021
  - Draft Concept Plan Workshop on 31 November 2021
- Targeted Stakeholder Consultation between August and November 2021.
- Review of Draft Concept Plan (December - February 2022).

Engagement Framework					
Level of Engagement	Inform	Consult	Involve	Collaborate	Empower
<b>Description</b>	One way communication providing balanced and objective information to assist understanding about the project and potential outcomes.	Two way communication designed to obtain feedback about ideas on rationale, alternatives and proposals to inform decision making.	Participatory process designed to help identify issues and views to ensure that concerns and aspirations are consistently understood and considered.	To partner with stakeholders to understand all issues and interests and to work out alternatives and identify preferred solutions.	To place final decision-making in the hands of the stakeholder.
<b>Actions</b>	Keep informed	Keep informed Listen, acknowledge concerns and aspirations Provide feedback on how input has influenced decision making.	Directly reflect concerns and aspirations Provide feedback on how input influenced decision making	Direct advice and innovation in formulating solutions, resolving priorities and determining outcomes	Involve in review and approvals process
<b>Methods/ Activities</b>	Introductory email and follow up phone call in Broad Concept development phase	Introductory email and follow up phone call in Broad Concept development phase	Meeting / workshop during broad concept development phase	Stakeholder workshop / meetings	Opportunity to review, approve and adopt final Concept Plan
<b>Groups</b>	Shire of SJ Residents and Ratepayers Association	Shire of SJ Equine Advisory Group, Equine businesses, SJ Trails Inc, Local horse club, Jarrahdale Heritage Society	DBCA Recreation, Planning and Design unit.	Project Steering Group: DBCA Perth Hills District. DBCA Recreation and trails Unit. Shire of SJ, ATHRA	

## 03 Consultation

### Project Steering Group Workshops

#### Opportunities and Constraints Workshop

A workshop was held with the Project Steering Group on 19 August 2021 with the key objective to identify opportunities and constraints across the Project Area.

The workshop was facilitated by Tredwell Management, with the following people in attendance:

- Kerstin Stender, DBCA, Recreation and Trails Unit
- Rebecca Hamilton, DBCA, Perth Hills District
- Suzanne Andrews, DLGSC
- Rebecca Steinki, Shire of SJ
- Vanessa Slater, Shire of SJ
- Anna Sheehan, ATHRA

The following apologies were noted:

- Alison Pritchard, DBCA, Recreation and Trails Unit
- Wendy Cumming, Equine Advisory Group
- Dr Heather Stewart-Rowe, Equine Advisory Group
- Julie Howes, ATHRA

Key discussion points are categorised and listed below. These were incorporated into the Opportunities and Constraints Map (Chapter 2).

#### Current Situation:

- There are nice views along the southwest section of the existing Jarrahdale Bridle Trail.
- There are unattractive sections of trail around the mining lease (i.e. fencing and clearing).
- The most steep/difficult section of the existing trail is north of the mining lease.
- Poor wayfinding causes new riders to get lost.
- Riders use the existing link north of Langford Park to Wungong Regional Park and Byford.
- Area east of Jarrahdale Oval which would likely be suitable as 'easy' trails.
- Conflict with horses and motorised trail bikes, however other trail users rarely encountered.

#### Desired Trail Experience:

- Wilderness-feel/Isolation in nature
- A dual direction trail is preferred. Existing trail is marked in clockwise direction only.
- Connectivity with strategic links to the north, south and west.
- Green trail should avoid major road crossings.
- Experienced riders (i.e. those on the Blue/ Intermediate Trail) are generally more self-sufficient and require less support infrastructure trails/less trail maintenance.

- Some sections of trail subject to surface erosion which requires higher maintenance levels. Alignment/design of new trail to avoid steep sections which are erosion-prone.

#### Trailhead, Access and Infrastructure:

- Jarrahdale Oval is well used as a key access point. It is the base for horse riders in the area.
- Crossing over Nettleton Road is generally not an issue due to low traffic volume.
- Jubb Road is not suitable as trailhead due to loose road surface and steep inclines being problematic for towing floats.
- Buckland Road has a cleared area near railway crossing. Currently used as a secondary trail access point, however required riding on Buckland Road to access trail.
- Open, gravel parking is ideal to accommodate floats. Formalised parking can be restrictive.
- Consider need for overflow parking space for events, and secondary trailhead for period when Jarrahdale Oval is used for events.
- Camping facilities and water are recommended at the Jarrahdale Oval trailhead.
- Provision of hitching rails provides alternatives to horses being tied to trees.
- Wayfinding signage is important for safety.

## 03 Consultation

### Environmental Management:

- Staying low on topographical profiles reduces the chance of spreading dieback into uninfested areas. Noted that dieback survey/mapping has not been updated and will occur during corridor evaluation.
- Orchids have been sighted to the north of the mining lease. Noted that flora survey/mapping has not been updated and will occur during corridor evaluation.

### Preliminary Draft Workshop

A workshop was held on 21 October 2021 with the key objective to provide insights into the preliminary direction of the trail concept and seek preliminary feedback.

The workshop was facilitated by Tredwell Management, with the following people in attendance:

- Alison Pritchard, DBCA, Recreation and Trails Unit
- Kerstin Stender, DBCA, Recreation and Trails Unit
- Jamie Ridley, DBCA, Perth Hills District
- Danielle Swepstone, DBCA
- Rebecca Steinki, Shire of SJ

The following apologies were noted:

- Rebecca Hamilton, DBCA Perth Hills District
- Vanessa Slater, Shire of SJ
- Anna Sheehan, ATHRA

Key discussion points are listed below. These were incorporated into the development of the Draft Concept Plan where appropriate.

- Identification of additional opportunities available with expansion of the Project Area (to include further areas to the southeast)
- Suggestion to investigate options to extend easy trail closer to 6km.
- Discussion of benefits and constraints of:
  - Utilising existing trail corridors
  - Inclusion of a conditioning track
- Request to incorporate strategic link to the south of the Project Area, linking with Jarrahdale Town Centre.
- Noted that the design principles of the *WA Mountain Bike Guidelines* are applicable to design of this bridle trail.
- Discussion of display/design style of concept maps.

## 03 Consultation

### Draft Concept Plan Workshop

A workshop was held on 31 November 2021 with the key objective for Tredwell to present the Draft Concept Plan prior to review and comment by the Project Steering Committee review.

The workshop was facilitated by Tredwell Management, with the following people in attendance:

- Alison Pritchard, DBCA, Recreation and Trails Unit
- Rebecca Hamilton, DBCA Perth Hills District
- Jamie Ridley, DBCA, Perth Hills District
- Vanessa Slater, Shire of SJ
- Rebecca Steinki, Shire of SJ
- Anna Sheehan, ATHRA

The following apologies were noted:

- Kerstin Stender, DBCA, Recreation and Trails Unit
- Wendy Cumming, Equine Advisory Group

Key discussion points are listed below. These were incorporated into the development of the Draft Concept Plan where appropriate.

- Discussion of challenges in ensuring that unauthorised users do not use bridle trails (e.g. trailbike riders). Agreement that additional enforcement measures will be required by DBCA.
- Need for clear signage to ensure that mountain bike riders do not deviate onto bridle trails.
- Discussion of opportunities and constraints related to establishing a secondary trailhead at Alcoa Road.
- Suggestion to extend the western extent of the intermediate trail to optimise views to the west.
- Support for alignment of trail being re-routed off Old Haul Road (near Nettleton Road underpass) to provide a more diverse trail experience.
- General consensus of approval with the intermediate trail (with the addition of the loop trail to the west).
- Noted that the Shire has committed to undertake the Jarrahdale Oval Trailhead Concept Plan project in the near future.
- Requirement for revision of strategic link north to Wungong Regional Park to terminate at the Admiral Road Float Parking Area (and not continue west to the Byford Trail Centre).
- Discussion of the need for DBCA and the Shire of SJ to work collaboratively to develop the trail and the Jarrahdale Oval Trailhead.

## 03 Consultation

### Targeted Stakeholder Consultation

A range of targeted stakeholder groups were contacted to provide information about the project, and contribute to the trail development process. A project information flyer was distributed with email correspondence to highlight the project's scope, key objectives and approach.

The groups who were contacted and provided input were:

- ATHRA (also represented on the Project Steering Group)
- Shire of SJ Equine Advisory Group
- Jarrahdale Trails Inc.

Various attempts were made during the consultation phase of the project (between August and November 2021) to contact the following stakeholders, however no contributions were received:

- Jarrahdale Equestrian Centre
- WA Endurance Riders Association Inc.
- SJ Adult Riders Club
- SJ Residents and Ratepayers Association

Key details about the consultation process and stakeholder contributions received are provided over the following pages.

#### ATHRA and Jarrahdale Trails Inc.

ATHRA and Jarrahdale Trails Inc. were represented by Anna Sheehan, who is a member of the Project Control Group. Anna Sheehan contributed to the development of the Opportunities and Constraints Plan through attendance at the Project Steering Group workshop, an in-person interview, and phone/email liaison between August and November 2021. Key contributions included:

##### Trail Experience:

- Desire for an intermediate loop that has a diverse experience with changing terrain.
- Easy trail could support horse and cart use.
- The southern section of Buckland Road provides a poor trail experience.
- Revegetated area east of the project area provides attractive bushland.
- Tracks east of the rail corridor between Johnson Rd & Alcoa Rd used by trail bikes, and the cleared area used for camping.

##### Trailhead and Float Parking:

- A trailhead at Buckland Road is not viable due to the future Tonkin Highway development.
- Desire for camping with horses to be facilitated at Jarrahdale Oval (and/or the RV Park). Note 3x3m yards are not suitable for overnight use.

##### Trail User Interaction:

- Clear signage/education is required to raise awareness about horses within Langford Park, particularly directed at mountain bike riders.

Bridle trails should not intersect with the mountain bike trail network.

#### SJ Equine Advisory Group

The SJ Equine Advisory Group was represented by Wendy Cumming who contributed to the identification of Issues and Opportunities Plan, and liaised with members of the local equine trail riding community to provide additional contributions via email/phone between August and October 2021. Key contributions are listed below.

##### Float Parking and Access:

- Float parking requires a firm and relatively level surface with safe entry and exit points.
- Buckland Road area is degraded and difficult to exit due to traffic on Jarrahdale Road.

##### Trailhead and Infrastructure:

- Traffic attenuation measures are required to allow for safe crossing of Nettleton Road near Jarrahdale Oval.

## 03 Consultation

### Review of Draft Concept Plan

A review of the Draft Concept Plan (9 December 2021) by the Project Steering Group was facilitated by Alison Pritchard, DBCA, Recreation and Trails Unit. Feedback was collated and provided to Tredwell Management on 7 February 2022.

Key feedback points are listed below. These have been incorporated into the development of the Concept Plan and Final Report.

- Revision of terminology used (e.g. references to Langford Park and Jarrahdale State Forest).
- Maps to be included towards front of report and review of maps style/accessibility.
- Further information on the depth and breadth of the community consultation process.
- Remove all reference to secondary trailhead.
- Revise estimate of probable costs.

#### Trail Access and Use:

- Desire for bridle trail access to prohibit mountain bikes and motorbikes.
- Wayfinding desired for use in both directions.

#### Strategic Links:

- Desire for a formalised link north from Jarrahdale to the Wungong Valley Gorge Bridle Trail and Byford Country Club.
- A link to the Jarrahdale Tavern would be appealing for horse riders.

#### Gallop Track:

- Desire for a 'gallop section' on an incline section - allowing for horse conditioning.

#### Trail Surface:

- The surface of the existing Jarrahdale Bridle Trail has been degraded from use by motorised trail bikes, and surface erosion.

#### Jarrahdale Heritage Society

The Jarrahdale Heritage Society was represented by Vicky Kerfoot who provided information via phone on 26 August 2021 and provided further information via email. Key contributions included:

#### Trail Promotion:

- The Jarrahdale Heritage Society are currently developing an updated book highlighting the trails offered in Jarrahdale.
- The existing Jarrahdale Bridle Trail is promoted in the book. Desire to include trail updates in new versions of the book.

#### Trail Experience:

- The area east of Nettleton Road contains rehabilitated areas providing different landscapes. These locations would be ideal for creating new bridle trails - unlikely to appeal to bushwalkers noting preference for remnant forest, views and other points of interest.
- The trails may offer opportunity to highlight the history of Jarrahdale through interpretive signage and trail information materials.

#### Access and Float Parking:

- Horse riders primarily access the trails in Jarrahdale via car and float.
- Jarrahdale Oval is ideal for float parking. Some floats currently park at Balmoral Road (east of Jarrahdale Township, near Mundlimup Timber Trail).



04

# Opportunities and Constraints



## 04 Opportunities and Constraints

### Opportunities and Constraints Plan

The Opportunities and Constraints Plan provided on the following page illustrates the key opportunities and constraints identified within the Project Area. Development of this plan was informed through the following processes:

- Background review
- Site assessment
- Consultation

The opportunities and constraints identified are described below and illustrated on the Opportunities and Constraints Plan.

Further explanations of the site assessment and consultation processes are provided in:

- Chapter 2: Site Assessment
- Chapter 3: Consultation

The Opportunities and Constraints Plan has been updated during the stages of the project as new information was gained. For example, following feedback from the Steering Group Workshop and information gained from the trail audit process.

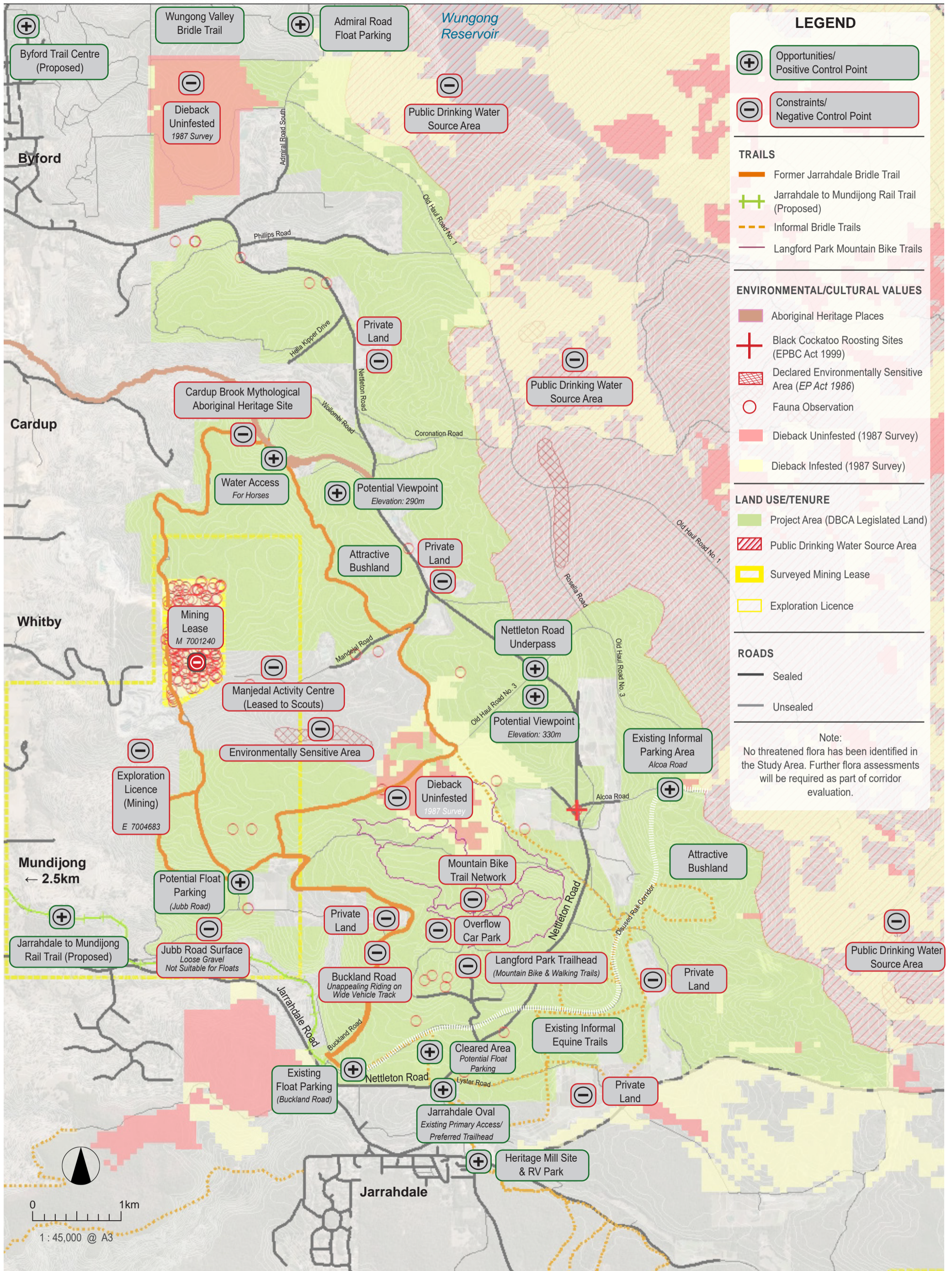
#### Key Opportunities

- Jarrahdale Oval - strategically identified for its potential as a trailhead and event space.
- Existing informal parking area adjacent to Alcoa Road.
- Nettleton Road Underpass - provides safe and uninterrupted connectivity along Old Haul Road No. 3.
- Potential viewpoint locations at topographical peaks.
- Opportunities for strategic connectivity to the north, south and west of the project area.

#### Key Constraints

- Mineral exploration licence (E: 7004683) - potential threat to longevity of trails in this area.
- Potential trail conflict points (e.g. location of mountain bike trail network).
- Restricted access to the east of the project area due to being a public drinking water source area (PDWSA).

# 04 Opportunities and Constraints



05

# Concept Plan



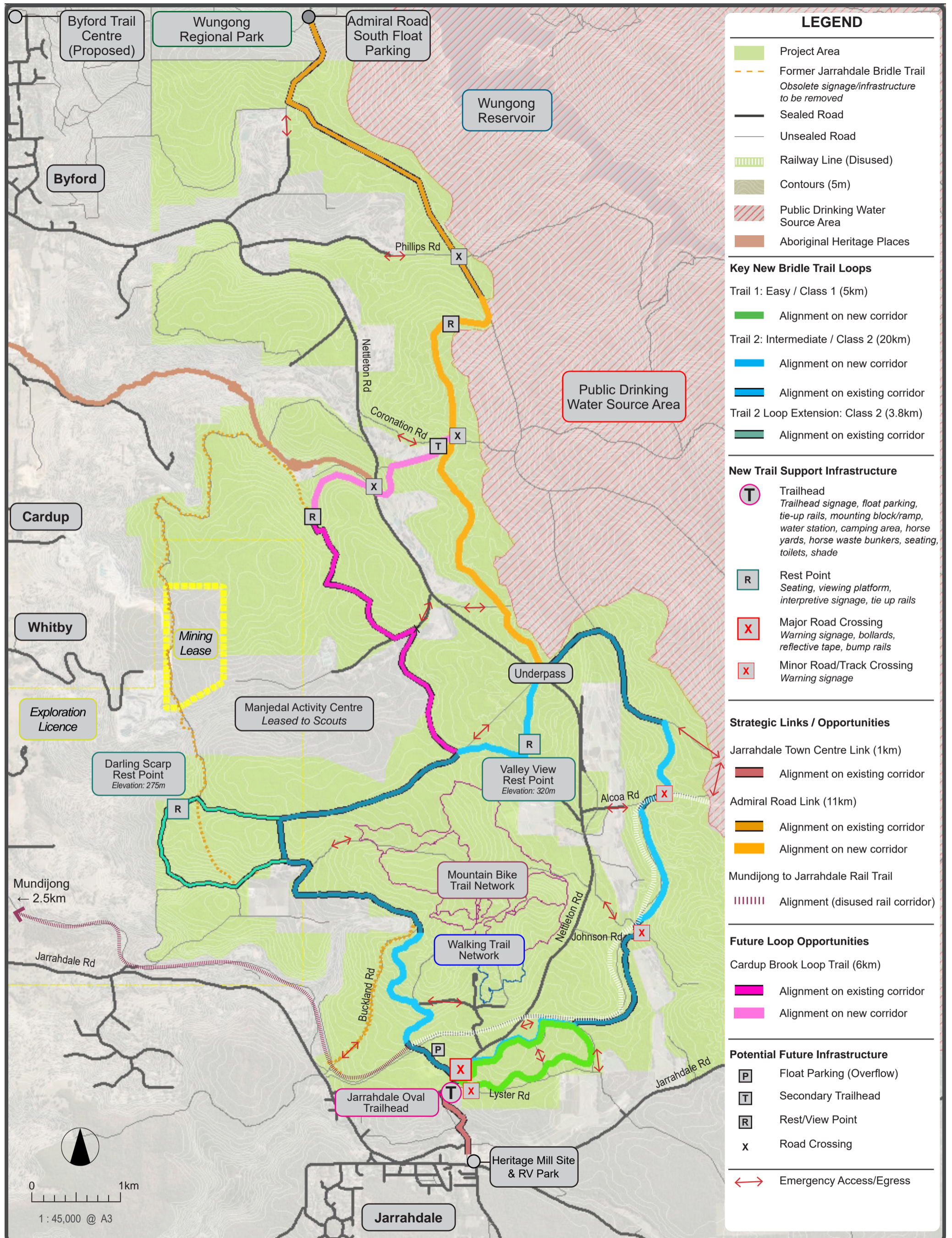
# 05 Concept Plan

## Design Intent

The Jarrahdale Bridle Trail Concept Plan (refer following page) has been developed to address the design intent outlined below. This has been developed based on the project brief and key findings from the background review, site assessment and consultation process.

Topic	Details
Trail Development Process	Aligns with the 8 stage Trail Development Process, including a framework and concept plan outlining broad corridors for trail alignment (i.e. 20 metres – 150 metres wide as per the Trail Development Series).
Trail User Market	Highlights opportunities for high quality trails to cater for horse riders and trail runners in the Project Area.
Trail System	Incorporates a stacked loop trail system and identifies strategic linkages.
Attractive Trail Experiences	Provides appealing trail experiences through attractive landscape settings, with access to views/vantage points.
Trail Lengths	Provides trail options for half to full day loop options for family and leisure focused recreation, including Easy Loop (green) – approximately 5 kilometres, and Intermediate Loop (blue) – approximately 20 kilometres.
Trail Appeal	Caters for horse riders and trail runners, and develops an appealing trail experience which draws new trail users to the region.
Emergency Access	Provides multiple suitable locations for emergency access/egress.
Road Crossings	Minimises road crossings and interactions with motorised vehicles.
Mountain Bike Trail Network	Does not interfere with the Langford Park Mountain Bike Trail Network or compromise the opportunity for expansion of this network.
Mineral Titles	Mitigates potential future threats of mining activities to significant investments in trail infrastructure (i.e. no significant trail infrastructure in the area subject to mineral exploration license).
Regional Context and Connections	Aligns with the Shire's strategic direction for equine trails, including provision of a connection between the Shire's northern equine hub (Jandakot, Oakford, Darling Downs, Wungong, Byford, Cardup) and southern equine hub (Mundijong, Whitby, Jarrahdale, Serpentine).
Trail Corridors	Provides a high quality trail experience while balancing use of existing trail corridors, and clearing of new trail corridors (i.e. utilises existing corridors where a positive experience can be provided).
Sustainable Trail Design	Ensures that the sustainable trail design principles can be adhered to in the next steps/design process resulting in reduced long-term maintenance requirements and minimised impact on natural and cultural assets.
Private Land	Avoids close interactions with private land and associated boundaries/fence lines.
Support Infrastructure	Utilises existing infrastructure and cleared areas where possible and recommends locations of new trail support infrastructure.
PDWSA	Does not traverse through/impact on the adjacent Public Drinking Water Source Area (i.e. remains within the designated Project Area).

## Concept Plan



# 05 Concept Plan

## Jarrahdale Oval Trailhead



Jarrahdale Oval is the proposed Trailhead for the Jarrahdale Bridle Trail Network.

This site is owned and managed by the Shire of SJ and is already utilised as a key access point for users of the former Jarrahdale Bridle Trail. The Shire supports the development of this site to support equine trail users and events, and has plans to prepare a master plan for the site to achieve this function.

It is noted that Jarrahdale Oval is located outside of the Project Area, however, is the most appropriate and accessible location for access to the new bridle trails network.

It is proposed that the following infrastructure is provided at the Jarrahdale Oval Trailhead:

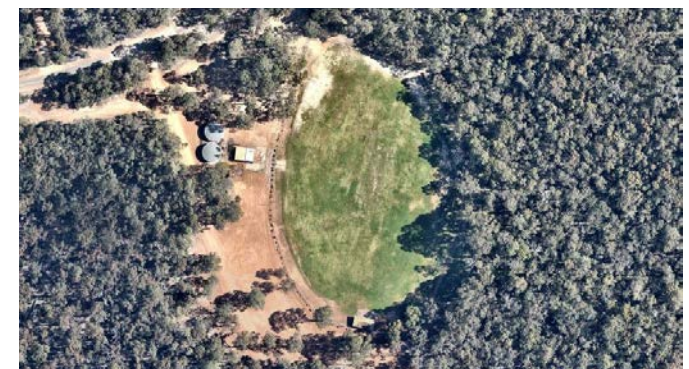
- Float parking (hardened but not paved surface)
- Trailhead signage
- Picnic facilities/shade
- Amenities block

- Horse confinement facilities (e.g. high lines, hitching rails or yards)
- Water tank/troughs
- Horse waste bunker
- Mounting block/ramp
- Campground
- Overnight horse confinement areas.

### Cost Estimate

Details	Estimated Cost
Key Components	\$738,249
Optional Components	\$74,875
<b>Sub-total</b>	<b>\$813,125</b>






*Costs have been rounded to the nearest dollar.*



# 05 Concept Plan

## Trail 1 (Easy Loop)

### Overview

Grade	Distance	Estimated Time	Direction	Elevation
				
Class 1 / Easy Trails with wide, consistent surface and width, gentle slope. For riders and horses with basic skills and fitness.	5km	30 - 60 minutes (Walking - Trotting at 5-10km/hour)	Clockwise or Anti-clockwise	High point: 265m Low Point: 245m Maximum Gradient: 5%

### Description

Trail 1 utilises new trail corridors. The trail begins and ends at an elevation of approximately 240 metres along gently undulating terrain.

The initial connection from the Jarrahdale Oval car park, across Lyster Road (minor, unsealed road) and into the bushland currently exists in an informal manner for approximately 200 metres, before tapering into overgrown bushland. It is proposed that the crossing point on Lyster Road is formalised to raise awareness and alert both vehicles on the road and horse riders/trail runners about the presence of the trail and road intersection.

The first 800 metres of the trail (if navigating in a clockwise direction), leads up to the highest elevation of 265 metres.

After 200 metres heading northeast from the trailhead, an intersection provides the opportunity for more experienced riders to take a left turn and cross Nettleton Road utilising the dedicated crossing point, and venture onto Trail 2.

Users of Trail 1 continue straight, weaving in a north easterly direction for approximately 1.5 kilometres toward the disused rail corridor, where the trail crosses the management track and turns in an easterly direction. The trail then loops back to the west, across the management track, back to the initial intersection and on to the trailhead.

This easy loop trail is ideal for beginner and/or leisure horse riders and for trail runners seeking a relatively short (5 kilometre) loop experience in a bushland setting. This trail involves minimal road crossings.

### Proposed Key Infrastructure/Works

Item	Qty
Existing trail corridor - widening and resurfacing (optional inclusion of dolomite surface)	240m
New trail corridor - clearing and surfacing (optional inclusion of dolomite surface)	4.8km
Signage on trail (wayfinding/management)	10
Vehicle signage on Lyster Road & management tracks (caution: horses crossing)	6
Lyster Road Crossing - bump rails and reflective tape	2

### Cost Estimate

Details	Estimated Cost
Key Components	\$216,545
Optional Components	\$310,033
<b>Sub-total</b>	<b>\$526,578</b>

Costs have been rounded to the nearest dollar.



# 05 Concept Plan

## Trail 1 - Concept Detail



- Project Area
- Sealed Road
- Unsealed Road
- Railway Line (Disused)
- Jarrahdale Oval Trailhead  
Trailhead signage, float parking, tie-up rails, mounting blocks/ramps, water station, camping area, horse waste bunkers, seating, toilets, shade






- Trail 1: Easy / Class 1 (5km)
- Alignment on new corridor (4.8km)
- Alignment on existing corridor (0.2km)
- Signage (Wayfinding/Management)
- Minor Road Crossing  
Warning signage

- Trail 2: Intermediate / Class 2 (20km)
- Alignment on new corridor
- Alignment on existing corridor

# 05 Concept Plan

## Trail 2 (Intermediate Loop)

### Overview

Grade	Distance	Estimated Time	Direction	Elevation
				
Class 2 / Intermediate Variable trails with narrow sections and uneven surfaces, moderate slope, some obstacles. For riders and horses with moderate skills and fitness.	20km	2-4 hours (Walking - Trotting at 5-10km/hour)	Clockwise or Anti-clockwise	High point: 330m Low Point: 245m Maximum Gradient: 10%

### Description

Trail 2 users begin on the same alignment as Trail 1, before taking a left turn and utilising the dedicated crossing point on Nettleton Road. The trail continues in a north westerly direction on an existing corridor, through a large cleared area and across an existing crossing of the disused railway line. The trail then weaves up the undulating slope, across contours, for approximately 2 kilometres, with the elevation increasing from 260 metres at the railway crossing to approximately 300 metres.

The trail proceeds gently downhill in a westerly direction, across the management track, to a 270 metre elevation. Users have the option to take a left turn to the Darling Scarp View Point along the Trail 2 Loop Extension (along existing trail corridors) which extends their loop trail experience to be approximately 26km. The main 20km loop trail climbs in a northerly direction, to meet with the Old Haul Road, where it links with the northern end of the loop extension.

After approximately 1.8 kilometres travelling east on Old Haul Road, the trail ventures back onto a narrow section where it gently climbs from 300 metres up to the Valley View Rest Point (the trail's peak elevation at 330 metres). This is an ideal rest point approximately half way along the loop trail.

The trail continues back along Old Haul Road, utilising the underpass on Nettleton Road and traversing along the existing corridor. A new north-south corridor along the 300 metre contour links Old Haul Road with Alcoa Road.

The trail continues south, initially along the disused rail corridor (where rail infrastructure has been removed) before venturing onto a new trail section with views from approximately 300m elevation. After crossing of Johnson Road, the trail links back with Trail 1 and returns to the Jarrahdale Oval Trailhead.

### Proposed Key Infrastructure/Works

Item	Qty
Existing trail corridor	12.8km
New trail corridor - clearing and surfacing	9km
Signage on trail (wayfinding/management)	35
Vehicle signage	20
Rest Point - Hitching rails	2
Rest Point - Mounting blocks	2
Rest Point - Picnic table/shelters	2
Rest Point - Viewing platform	2

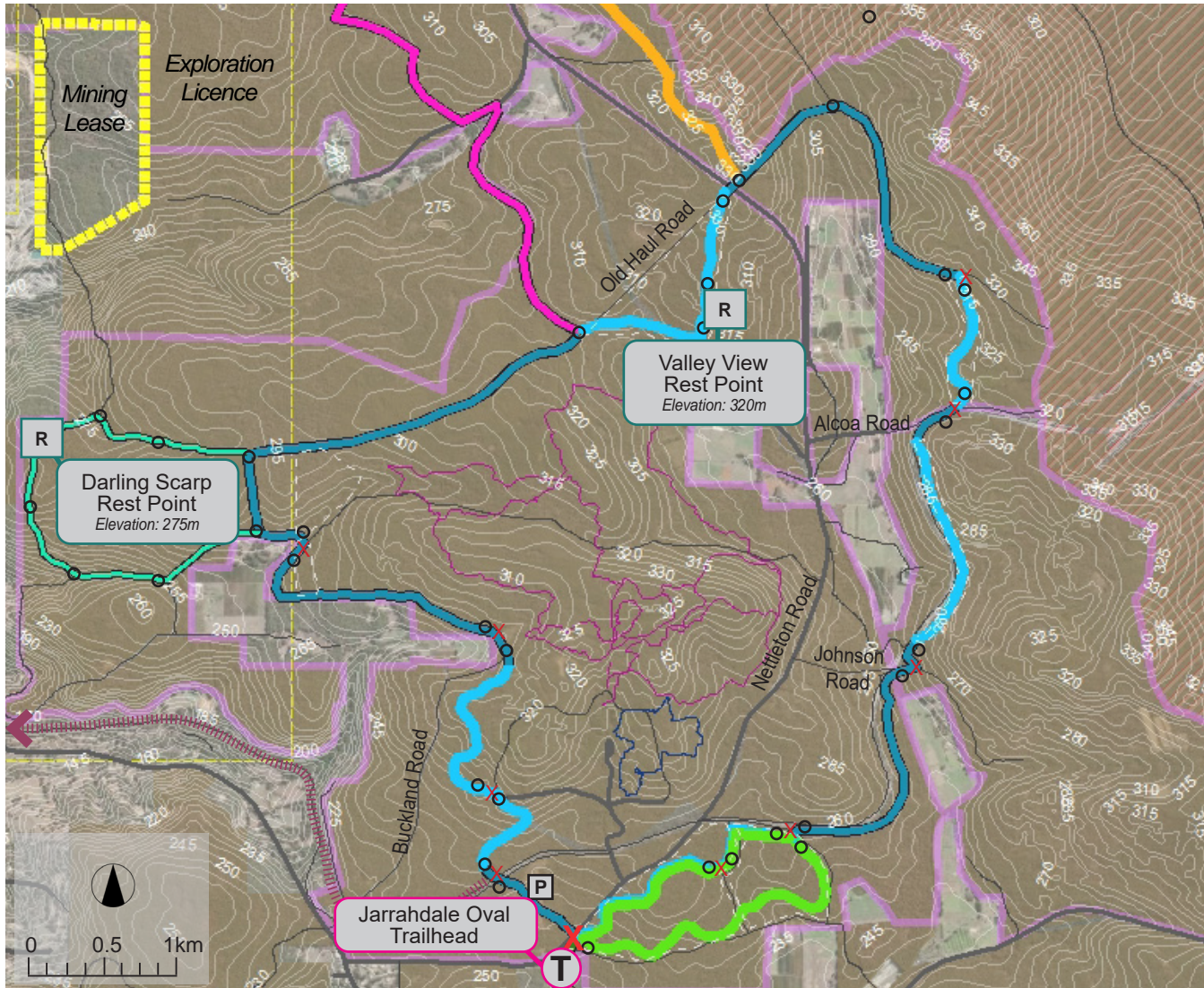
### Cost Estimate

Details	Estimated Cost
Key Components	\$738,250
Optional Components	\$74,875
<b>Sub-total</b>	<b>\$813,125</b>

Costs have been rounded to the nearest dollar.

# 05 Concept Plan

## Trail 2 - Concept Detail



- Project Area
  - T Jarrahdale Oval Trailhead
  - Sealed Road
  - Unsealed Road
  - Railway Line (Disused)
  - Walking Trail Network
  - Mountain Bike Trail Network
- Trail 2: Intermediate / Class 2 (20km)
- Alignment on new corridor
  - Alignment on existing corridor
  - X Major Road Crossing  
*Warning signage, bollards, reflective tape, bump rails*
  - x Minor Road/Track Crossing  
*Warning signage*
  - o Signage (Wayfinding/Management)
  - P Potential Future Float Parking (Overflow)
  - R Rest/View Point
- Trail 2 Loop Extension: Class 2 (3.8km)
- Alignment on existing corridor
- Trail 1: Easy / Class 1 (5km)
- Alignment on new corridor (4.8km)
  - Alignment on existing corridor (0.2km)
- Admiral Road South Link
- Alignment on new corridor
- Cardup Brook Loop Trail
- Alignment on existing corridor
- Mundijong to Jarrahdale Rail Trail
- Alignment on disused rail corridor

# 05 Concept Plan

## Strategic Linkages

### Jarrahdale Town Centre Link (Southern Strategic Link)

Formalisation of the Jarrahdale Town Centre Link would allow for trail users to access the Jarrahdale Oval Trailhead from the Jarrahdale Town Centre, utilising a marked route along the unsealed Millars Road.

This also connects with the RV Park and the Heritage Mill Site, which is a key point of interest along the Jarrahdale Heritage Town Walk.

There may be future opportunity to consider further linkages along Gooralong Brook to other key locations in Jarrahdale, such as the Jarrahdale Tavern (requiring a crossing point Jarrahdale Road).



Millars Road



Jarrahdale RV Site



Jarrahdale Heritage Town Walk Sign

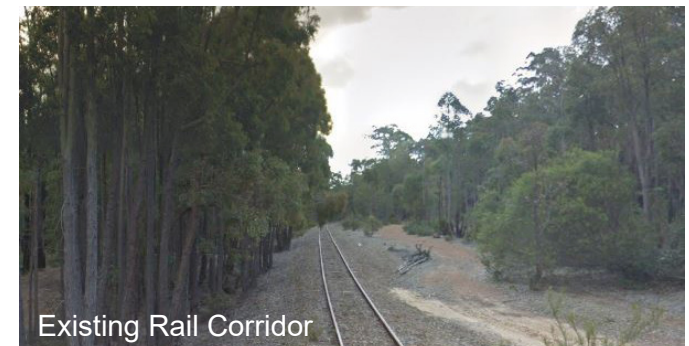


Jarrahdale Heritage Mill

### Mundijong to Jarrahdale Rail Trail (Western Strategic Link)

Over the long term, development of the proposed Mundijong to Jarrahdale Rail Trail would allow for access to the trail network from the west. This proposed rail trail is 9.2km between Mundijong and Jarrahdale, and could cater for walkers, bike riders and horse riders. Part of this route is currently marked as the 1872 Heritage Railway Trail.

Details of this opportunity are outlined in the *SJ Trail Development Business Case (2020)*.



Existing Rail Corridor



Existing Rail Corridor

## 05 Concept Plan

### Admiral Road Link (Northern Strategic Link)

Development of the Admiral Road Link Trail would provide a link through Langford Park to the existing float parking area on Admiral Road South. This also has the potential to form part of a critical link between the region's northern equine hub (Jandakot, Oakford, Darling Downs, Wungong, Byford, Cardup) and southern equine hub (Mundijong, Whitby, Jarrahdale, Serpentine). Currently, this connection relies upon a link along Old Haul Road, which traverses through the PDWSA and is not deemed suitable for horse riding. A new trail corridor link is proposed which provides connection between sections of the Old Haul Road without traversing into the PDWSA.



Old Haul Road

### Cardup Brook Loop Trail (Future Loop Option)

With the establishment of the Wungong Valley Link, a key opportunity may arise to develop an additional loop trail for the Jarrahdale Bridle Trail Network.

This proposed loop incorporates existing corridors to the east of the Mandejal Activity Centre (avoiding the lease), and a new corridor which passes the Cardup Brook (Aboriginal Heritage Place), crosses Nettleton Road (requiring a formalised crossing point) and forms a loop with the Wungong Valley Link Trail.



Existing Corridor



Cardup Brook

06

# Implementation



## 06 Implementation

### Estimated Costs

Rider Levitt Bucknall (Quantity Surveyors) have prepared an Order of Probable Costs for the development of the Jarrahdale Bridle Trail, based on the Concept Plan. This estimate provides important information for consideration in the project's next steps, particularly in determining the level of funds required for implementation.

The following costs supplied by RLB Quantity Surveyors provide a guide of the anticipated costs:

- Development of new trail corridor (1.5m width): \$24,000/km
- Dolomite surface finish (optional on easy loop trail): \$42,000/km
- New primary trailhead sign: \$2,500/unit
- Trail wayfinding signage: \$750/unit.

Specific per unit infrastructure costs have been included in Appendix 4: Cost Estimate.

### Cost Summary

The following table highlights the anticipated costs for the bridle trail development. Costs have been broken down into 'key components' and 'optional components'.

Ref	Details	Estimated Cost
<b>A</b>	<b>Jarrahdale Oval Primary Trailhead</b>	<b>Sub-total</b>
		<b>\$763,700</b>
A1	Key Components	\$648,200
A2	Optional Components	\$115,500
<b>C</b>	<b>Trail 1 (Class 1/Easy Loop Trail)</b>	<b>Sub-total</b>
		<b>\$526,500</b>
C1	Key Components	\$216,500
C2	Optional Components	\$310,000
<b>D</b>	<b>Trail 2 (Class 2/Intermediate Loop Trail)</b>	<b>Sub-total</b>
		<b>\$813,200</b>
D1	Key Components	\$738,300
D2	Optional Components	\$74,900
<b>E</b>	<b>Removal of Obsolete Signage</b>	<b>\$13,600</b>
	<b>Total</b>	<b>\$2,117,000</b>

Costs in this summary table have been rounded to the nearest hundred dollars.

Note: Component B was a Secondary Trailhead at Alcoa Road which has been removed from the Concept Plan following feedback.

The following components are included within the cost estimates above: Preliminaries and Supervision (10%); Builders Margin and Overheads (5%); Professional Fees (7%); Design Contingency (7.5%); Construction Contingency (7.5%); Statutory Fees and Charges (0.5%).

The complete Order of Probable Costs is included as Appendix 4: Cost Estimate.

It is recommended that an annual asset maintenance allowance of 1.5% of the trail construction cost (including support infrastructure) is considered in the Trail Management Plan and associated budgeting. Asset maintenance costs are to be refined, along with the estimated trail development costs, during the corridor evaluation and detailed design processes.

# 06 Implementation

## Recommended Next Steps

In line with the 8 Stage Trail Development Process, the recommended next steps for the development of the Jarrahdale Bridle Trail are outlined in the following table. Actions have been listed under the following categories: A: Planning and Design; B: Construction; C: Management and Activation; D: Monitoring and Evaluation.

### A: Planning and Design

Ref	Details
A1	<b>Aboriginal Cultural Heritage:</b> Undertake an Aboriginal Cultural Heritage Assessment and work with Traditional Owners to seek advice and guidance on features of cultural significance. Utilise findings in the trail corridor evaluation process and in development of the Trail Management Plan.
A2	<b>Environmental Assessment:</b> Undertake environmental assessments (including flora, fauna and phytophthora dieback surveys) to identify and mitigate impacts on biodiversity and environmental values. Utilise findings in the trail corridor evaluation process and in development of the Trail Management Plan.
A3	<b>Cross-Agency Collaboration:</b> Ensure ongoing collaboration between the DBCA, Shire of SJ to guide the next steps of the Trail Development Process across land tenures. Note: This applies to the key trails and strategic linkages.
A4	<b>Jarrahdale Oval Trailhead:</b> Ensure ongoing collaboration between the DBCA and the Shire of SJ in the development of a master plan for the Jarrahdale Oval Primary Trailhead.
A5	<b>Corridor Evaluation:</b> Undertake a detailed assessment of the trail corridor proposed in the Concept Plan to identify specific constraints and formally establish the location of the trail corridor and key infrastructure. Flag the corridor centreline in the field and digitally capture the alignment and key features. Refine cost estimates based on refine trail corridor.
A6	<b>Alcoa Road Trailhead:</b> Undertake a Master Planning process for the development of a secondary trailhead at Alcoa Road.
A7	<b>Project Steering Group:</b> Continue engagement with the Project Steering Committee during the design process. Consider including a representatives of the WA trail running community to ensure the targeted trail running market is appropriately considered.
A8	<b>Trail Naming:</b> Determine appropriate names for the trail network and the loop trail experiences offered. Ensure trail names are consistent, relevant and representative of the trail experiences offered, and reflect targeted usage (i.e. trail running and horse riding). Guidance on trail naming is provided in Appendix 3: Trail Naming & Signage.
A9	<b>Detailed Design:</b> Undertake detailed design process which includes: <ul style="list-style-type: none"> <li>Formally establishing definitive trail lines, accurately flagged in the field and digitally captured.</li> <li>Preparing the Design Plan which includes construction specifications and drawings.</li> <li>Designs for the construction of trailheads and campsites.</li> </ul> Refine cost estimates based on outcomes of detailed design.
A10	<b>Approvals:</b> Gain all relevant approvals to commence construction of the trail, including clearing permits (as required under the <i>Environmental Protection Act 1986</i> ) where required for vegetation clearing along new trail corridors.
A11	<b>Signage Plan:</b> Develop a Signage Plan which documents the style, content and location of Trailhead signs (primary and secondary); Waymarking/directional signage; Interpretation signage; Management/warning signage. Guidance on signage content and style is provided in Appendix 3: Trail Naming & Signage.



## 06 Implementation

### B: Construction

Ref	Details
B1	<b>Trail Construction:</b> Based on the specifications of the Design Plan, construct the trail and trailheads. Note: Shire of SJ to lead the development of the Jarrahdale Oval Primary Trailhead.
B2	<b>Signage and Support Infrastructure:</b> Based on the specifications of the Design Plan and Signage Plan, manufacture and install signage and support infrastructure to support the trail network (including signs targeted at vehicle drivers and mountain bike riders).

### C: Management and Activation

Ref	Details
C1	<b>Trail Management Plan:</b> Develop a Trail Management Plan which encompasses all aspects of managing the trail, including: <ul style="list-style-type: none"> <li>• Roles and responsibilities for management (including enforcement of unauthorised users), maintenance, activation, evaluation and progressive development</li> <li>• Risk Management Plan and associated risk audit</li> <li>• Clearly articulated roles and responsibilities with clear maintenance and service standards</li> <li>• Inspection and maintenance schedules</li> <li>• Clearly articulated resource requirements and funding/revenue streams.</li> </ul>
C2	<b>Trail Information Resources:</b> Develop a suite of trail information resources and maps (printed and online) to ensure that prospective trail users are well informed about the trail experience/s offered, key features, difficulty/risk/safety information, booking options, trail etiquette, cultural heritage and sensitive environmental values etc.
C3	<b>Trail Activation:</b> Seek opportunities to activate the trail through programs and events which promote and raise the profile of the Jarrahdale Bridle Trail Network (e.g. Trail Opening Day, guided tours, fundraising events, horse riding/trail running competitions/events etc).

### D: Monitoring and Evaluation

Ref	Details
D1	<b>Trail Monitoring:</b> Monitor usage of the trails through collection of visitor statistics to inform trail evaluation, prioritisation of maintenance works, new trail developments and to demonstrate trail usage levels and trends.
D2	<b>Trail Evaluation:</b> Evaluate the extent to which the Jarrahdale Bridle Trails achieve the original its objectives, measuring the success of the project to identify achievements and highlight areas for improvement for the benefit of future projects.

## 06 Implementation

### Estimated Demand and Usage

Future usage of the Jarrahdale Bridle Trail Network has been estimated to provide an indication of the anticipated level of use for the trail system proposed. It is predicted that the trail network will be used by individuals for horse riding and trail running, and will also attract events.

While it is impossible to predict the future with a strong degree of certainty, particularly with a rapidly changing visitor market and recreational preferences, participation rates and visitor statistics can provide relevant insights. AusPlay participation data and Tourism Research Australia visitor statistics have been used as inputs to indicate the estimated annual usage of the Jarrahdale Bridle Trail with the targeted markets (horse trail riders and trail runners).

Collection and monitoring of trail usage data, and participation rates, is paramount for understanding the success and sustainability of recreational trails, and for well informed strategic planning.

#### Participation Data

Sport and recreation participation rates across Australia and the states/territories is collated through the annual AusPlay Survey, administered by Sport Australia.

The participation data which is of most relevance to provide an indication of future usage of the Jarrahdale Bridle Trail is for the activities 'equestrian activities' and 'bushwalking'. This data is used as a guide because 'horse trail riding' and 'trail running' are not specifically captured.

The most recent Adult participation rates for Equestrian activities and Bushwalking are shown in the table below.

Activity	Participation Rate WA Adult Population (July 20 - June 21)
Equestrian Activities	1.0%
Bushwalking	7.8%
<b>Total</b>	<b>8.8%</b>

Note: Data for these activities (bushwalking and equestrian) does not capture participation for people under 15 years of age.

Despite the limitations in participation data for trail running and horse trail riding, the above participation data is used as an indication of potential usage of the Jarrahdale Bridle Trail.

#### Visitation Data

Tourism Research Australia provides a profile for local governments in relation to international travel, domestic overnight travel and domestic day travel. The table below outlines the most recently published key visitor statistics for the Shire of SJ.

Type of Visitor to Shire of SJ	Visitor Numbers (2019)
International (Pre-COVID)	5,000
Domestic Overnight/Short Stays	42,000
Domestic Day Trips	258,000

#### Demand Estimate

The estimated usage of the Jarrahdale Bridle Trail is provided below. This estimate has been calculated based on the equestrian and bushwalking participation rate (8.8%) and the Shire of SJ's domestic short stay and domestic day trip visitors in 2019.

The demand estimate also allows for two annual events – one trail running event and one bridle trail event. Estimated event participation numbers are listed below.

- Trail running event: 1,500 (based on registrations for the Margaret River Ultra Marathon).
- Horse trail riding event: 100 (based on registrations for the Jarrahdale Endurance Ride).

As shown in the table below, it is estimated that annually there will be a 31,200 users of the Jarrahdale Bridle Trail.

Type of User	Estimate (per annum)
Local Visitors	3,200
Domestic Overnight Visitors	3,700
Domestic Day Trips Visitors	22,700
Event Visitors	1,600
<b>Total (Excl. International)</b>	<b>31,200</b>

Attraction of one-off, national-level events, such as the Tom Quilty Endurance Championship (hosted in Collie in October 2021) could further elevate usage and profile of the area's trails and strategic links.

## 06 Implementation

### Potential Funding Opportunities

A range of funding sources may be available to support the DBCA and the Shire of SJ with the development of the Jarrahdale Bridle Trail Development Concept Plan. These programs change regularly, and it is important maintain up to date details on funding opportunities.

#### Commonwealth Government – Building Better Regions Fund (BBRF)

The Department of Infrastructure, Transport, Regional Development and Communications operates the \$1.29 billion BBRF supports the Australian Government's commitment to create jobs, drive economic growth and build stronger regional communities into the future. The fund invests in projects located in, or benefiting eligible areas outside the major capital cities. The Project Area is eligible, as an 'Inner Regional' area.

Of most relevance is the Infrastructure Projects Stream. This supports projects that involve construction of new infrastructure, or the upgrade or extension of existing infrastructure.

The Australian Government announced \$250 million in the 2021-22 Budget towards a sixth round of the BBRF.

Further information:  
[www.regional.gov.au/regional/programs/building-better-regions-fund](http://www.regional.gov.au/regional/programs/building-better-regions-fund)

#### Business Australia – Stronger Communities Programme

The Stronger Communities Programme provides each of the 151 federal electorates with \$150,000 to fund small capital projects. These projects aim to improve local community participation and contribute to vibrant and viable communities. Federal Members of Parliament identify potential projects, inviting applications from their electorate.

The grant amount for small capital projects is up to 100% of eligible project costs except for local governing bodies where grant funding will be up to 50% of eligible projects costs. Grant requests must be between \$2500 and \$20,000.

Further information:  
[www.business.gov.au/grants-and-programs](http://www.business.gov.au/grants-and-programs)

#### WA Government Community Sporting and Recreation Facilities Fund (CSRFF)

The Department of Local Government, Sport and Cultural Industries (DLGSC) operates the CSRFF which supports the WA Government's commitment to the development of sustainable infrastructure for sport and recreation across the State.

The program aims to increase participation in sport and recreation, with an emphasis on physical activity, through rational development of sustainable, high quality, well-designed and well utilised facilities. There is \$12 million available for allocation in the 2021/22 funding round.

Further information: [www.dlgsc.wa.gov.au/funding](http://www.dlgsc.wa.gov.au/funding)

#### WA Government - Active Regional Communities Grants

The DLGSC operate the Active Regional Communities Grants program which aims to increase the opportunities for regional people to participate in sport and active recreation activities in regional WA. The grants cater for both sport and active recreation.

Grants up to \$5000 are available, with applicants needing to demonstrate a significant contribution (up to 25%) towards the cost of the project or event, and/or in-kind contribution.

Further information: [www.dlgsc.wa.gov.au/funding](http://www.dlgsc.wa.gov.au/funding)

#### Lotterywest – Grassroots Community Led Grants

Grassroots Community Led Grants help non-for-profit organisations and local governments deliver great outcomes for communities across WA, in line with the outcomes in the Community Investment Framework.

Further information: [www.lotterywest.wa.gov.au/grants](http://www.lotterywest.wa.gov.au/grants)

#### Trusts and Foundations

There are many trusts and foundations established in Australia with a number providing funding for a range of projects. Often, they are established by large corporations.

Further information: [www.philanthropy.org.au](http://www.philanthropy.org.au).

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## 06 Implementation

### Commercial and Private Sector Funding

Commercial and private sector funding is often used to assist with a variety of projects and their ongoing operations. Opportunities such as naming rights and in-kind donations are often available.

For example, Alcoa Foundation has a grant program which invests where Alcoa has a presence to further sustainability and to partner with communities to address local needs, particularly as they adapt in a changing world economy.

In determining where to invest, Alcoa Foundation looks for projects and nonprofit partners with the following characteristics:

- Projects designed to produce measurable, long-term results
- Projects that can be effectively implemented and ultimately continued without Alcoa Foundation funding
- Projects that are replicable and can be shared with other organisations looking to produce similar results
- Projects that demonstrate their commitment to the inclusion of diverse and/or under-represented populations.

The Foundation supports organizations that are dedicated to 1) promoting the prevention of and resilience to climate change and 2) the restoration and preservation of biodiversity.

### Development Contributions

Development contributions are a mechanism for the sharing of infrastructure costs for district level infrastructure from owners of land within a defined Development Contribution Area. A Development Contribution Plan identifies capital infrastructure required to support actual or anticipated growth in a specific area and shares the cost across the developments driving the growth.

07

# Target Markets and Trends



## 07 Target Markets and Trends

### User Groups

The new Jarrahdale Bridle Trails will cater primarily for horse trail riding as well as trail running. These trails will cater for local and potentially regional users, with half to full day loop options for family and leisure focused recreation.

These two key user groups are described below.

#### Horse Trail Riding

Horse trail riding includes short recreational riders (leisure), endurance riders (participating in riding competitions or using trails for training purposes) and long distance riders (partaking in overnight experiences or longer journeys on horseback).

#### Trail Running

Trail running has emerged as a popular activity, particularly with the growing popularity of trail running events. Recreational trail runners typically use trails close to home whereas enthusiasts travel to experience specific trails.



### Target Markets

The following primary and secondary target markets have been determined in the project brief. The definitions below (adapted from Australia's mountain bike market segments) help to articulate the differences in these market segments.

#### Primary Target Markets

- **Leisure:** Includes general trail users of all ages and abilities. They are most likely to use highly accessible routes close to home or make the journey to trail facilities with amenities and services.
- **Enthusiast:** Enthusiasts are purely recreational riders with moderate skills and variable fitness, and ride weekly. They prefer trails with good signage and are the most likely to take short breaks to different areas.

#### Secondary Target Markets

- **Sport:** Competitive trail users who regularly use trails and are members of clubs. They are willing to seek less accessible trails and have high fitness level and are technically proficient. They use a wide variety of trails.
- **Independent:** Skilled outdoor enthusiasts who use trails once a week, are technically proficient with a good level of fitness. Often involved in various outdoor activities, they are capable of planning their own journeys and use a variety of trails. The adventurous aspect is more important than the technical challenge and they seek more remote trails.

# 07 Target Markets and Trends

## Social, Environmental and Tourism Trends

Society, the environment and the tourism sector, are continually evolving. New trail developments need to consider the changes that likely lie ahead. Understanding trends will help ensure that the Jarrahdale Bridle Trail appeals to future users, is safe and sustainable. Key relevant trends are listed below.



Popularity of nature based tourism



Increasing participation in individualised activities



Increasingly high standards and expectations



Loss of biodiversity and heritage



Need for balance of recreation and conservation



Increased intensity and frequency of bush fires



Ageing people are increasingly active



Desire to stay connected



Technological advancements



Public critique of parks management



Need for long-term strategic planning



People seeking experiences over products



Recognising trails as achieving numerous policy objectives (i.e. health, economic, environmental)

## Impacts of COVID-19

COVID-19 has had a profound impact on WA's visitor economy, with a rise in intrastate travel and day trips and a decrease in international and interstate travel.

While it is impossible at this time to predict the future with a strong degree of certainty, a range of trends and issues are becoming apparent since the beginning of the COVID-19 pandemic relating to the following:

- Growth in popularity of nature based and trail based activities
- Confidence in shorter trips and local travel
- Social distancing and other precautions
- Preference for drive tourism and touring trips
- Border closures blocking international tourism markets
- Last minute trip planning.



# Appendices





# Appendices

## List of Appendices

Appendix 1: Background Review

Appendix 2: Soil Types

Appendix 3: Trail Naming & Signage

Appendix 4: Order of Probable Costs

# Appendix 1 Background Review

## Appendix 1: Background Review

### Strategic Context

Document	Key Relevant Details
<i>WA Strategic Trails Blueprint 2017 – 2021</i>	<p>Provides the overarching framework for consistent and coordinated planning, development and management of quality trails and trail experiences across Western Australia.</p> <p>Vision: 'by 2021 more people will be using Western Australia's trail network resulting in greater community, social, cultural, economic, environmental, health and wellbeing outcomes for WA'. The next revision of the Blueprint (2022) is currently being developed.</p>
<i>WA Trail Development Series (2019)</i>	<p>Provides best practice guidance to any trail proponent including details of the 8 Stage Trail Development Process, community consultation and the multi-criteria decision analysis tools.</p> <p>The 8 stage Trail Development Process is widely considered best practice for all types of recreational trails.</p>
<i>WA Recreational Horse Trail Strategy (2015)</i>	<p>Provides a coordinated &amp; structured approach to horse trail development and management.</p> <p>Vision: 'WA to have the opportunity to enjoy diverse and quality horse trail experiences'.</p> <p>Strategic priorities: 1. Trails Inventory; 2. Trails Access; 3. Facilities &amp; Infrastructure; 4. Education and Advocacy; 5. Management &amp; Governance.</p> <p>Identifies the need for easily accessible trails and new linkages, loops and connections of existing trails that create a cohesive riding experience of one to four hours.</p>
<i>WA Hiking Strategy 2020 – 2030</i>	<p>Provides a strategic direction for hiking (including trail running) in WA. Seeks to maximise opportunities for all Western Australians and visitors to benefit from access to an appropriate range of hiking experiences and will guide the sustainable development of hiking activities and associated trails infrastructure.</p> <p>Vision: 'All Western Australians and visitors to have the opportunity to connect to country and explore natural landscapes through bushwalking and trail running'.</p> <p>Key relevant recommendations:</p> <ul style="list-style-type: none"> <li>1.2.2 Identify and develop a spectrum of hiking experiences of varying challenge in parks and reserves across the State.</li> <li>1.2.3 Develop more half- and full-day loop trails near population centres and adjoining long distance trails</li> <li>1.4.1 Develop and promote a code of conduct for shared trail use</li> <li>2.2.3 Where appropriate and within capacity, identify potential large-scale trail running events targeting interstate and international participants</li> <li>3.1.3 Consider dual- and multi-purpose trails to capitalise on existing assets where appropriate.</li> </ul>

## Appendix 1 Background Review

Document	Key Relevant Details
<p><i>WA Forest Management Plan 2014-2023</i></p>	<p>WA's national parks, conservation parks, nature reserves, state forests and timber reserves are vested in the Conservation Commission of WA.</p> <p>The plan aims to strike a balance between conservation and other activities. It incorporates a number of management activities to help conserve biological diversity, provide for recreation and a sustainable native forest products industry, and to protect water catchment initiatives. It is a 10-year plan developed in consultation with the community. It is the key policy framework for managing forests as these plans identify goals and performance targets and propose management activities to achieve these goals.</p> <p>The plan addresses the management of the socio-economic benefits flowing from the use of the plan area, including recreation and tourism, timber harvesting, access via roads and bridges, basic raw materials extraction and bio-prospecting.</p> <p>Vision: 'Biodiversity to be conserved, the health, vitality and productive capacity of ecosystems to be sustained, soil and water resources to be protected and the contribution to global carbon cycles to be sustained'.</p>
<p><i>Peel Equine Strategy (2017)</i></p>	<p>Provides an economic analysis of the equine industry and identifies initiatives for future investment and policy development, to support the future growth of the industry. Peel is positioned as the premier region for the expansion of the equine industry in regional WA.</p> <p>Key relevant goals:</p> <p>Increase participation in sporting and recreational equine activities;</p> <p>Enhance the equine tourism potential of the region.</p> <p>Initiative 6.2: Explore opportunities to identify, promote and enhance horse riding trails and associated infrastructure to increase visitation by recreational riders.</p>
<p><i>Peel Regional Trails Strategy (2019)</i></p>	<p>Guides future strategic investment in trails recreation, tourism and event development across the Peel region.</p> <p>Vision: 'The Peel Region to offer locals and visitors immersive and accessible trail experiences, supported by services offered within trail towns, centres and networks'.</p> <p>Identifies that Jarrahdale has potential as a nationally significant location for equine trails.</p> <p>Key relevant recommendations are:</p> <p>1.20: Jarrahdale Oval should be established as a formal trail head for bridle trails within Jarrahdale State Forest. With considered planning this site also has potential to host events.</p> <p>1.21: Investigate creation of a network of bridle trails within Jarrahdale State Forrest, starting and ending at Jarrahdale oval trailhead. Trails should include a range of classification.</p>

## Appendix 1 Background Review

Document	Key Relevant Details
Shire of Serpentine Jarrahdale Tourism Strategy 2018-2023	<p>Identifies the eight tourism priorities that will take the Shire forward towards its goal of transforming Serpentine Jarrahdale into a high-ranking day-trip and holiday destination.</p> <p>Key relevant priorities:</p> <ul style="list-style-type: none"> <li>• Trails and expansion of the region’s trail network, “On the Trail” – This priority reviews the existing trails network and considers the opportunity for Serpentine Jarrahdale to become a highly desirable Trail Town destination.</li> <li>• Branding and Wayfinding, Finding the Way – This priority identifies the need for an innovative, consistent, consumer-centric tourism brand for the Shire of Serpentine Jarrahdale. This section also considers wayfinding – the means by which potential visitors discover the locality and, once they’ve decided to visit, move easily from point to point within it, so that maximum exposure of the area’s tourism attractions is achieved.</li> <li>• Equine Tourism, Horses for Courses – This priority recognises Serpentine Jarrahdale’s peak position in Western Australia’s equine tourism sphere and explores the potential for equine-based tourism across various areas of activity. Equine trails will be a key feature and point of difference.</li> <li>• Attractions (Natural, Cultural and Historic), Go Natural – This priority explores ways to develop sustainable tourism visitation through the significant portion of the Shire that is included in the natural estate. This includes large tracts of land in and around Jarrahdale, including the Project Area.</li> <li>• Adventure Tourism, Tap into Adventure – This priority takes advantage of the topography of the land in many parts of the Shire to develop healthy activities that will attract significant numbers of tourists. Adventure tourism integrates with other tourism priorities, such as trails and a number of private sector initiatives. Trails and their associated activities can be forms of adventure tourism.</li> <li>• Events, In the Event – This priority considers how the addition of regular and occasional events will help attract large numbers of special interest tourists to the Serpentine Jarrahdale area. This could include trail based events such as trail running and endurance rides.</li> </ul>
Shire of SJ Equine Strategy (2018)	<p>Provides an overview of the equine sector in the Shire of SJ, its position in relation to the Peel Region and the State, and to establish goals and strategic actions to achieve to ensure there is continued support and development of the sector into the future.</p> <p>The Strategy identifies that there are currently Northern and Southern Equine Hubs in the Shire, and that these should be celebrated and encouraged.</p> <p>It is highlighted that Jarrahdale Oval is intended to be an events space (with no riding on the oval permitted), however can easily function as an equine trailhead location with parking facilities.</p>

## Appendix 1 Background Review

Document	Key Relevant Details
<p><i>Shire of SJ Draft Equine Trails Master Plan (2021)</i></p>	<p>Outlines the opportunity for expansion of strategic equine trail networks across the Shire of SJ.</p> <p>Vision: 'A diverse, interconnected and sustainable network of equine trails, which is supported by reliable information and high-quality equine trail infrastructure, amenities and signage, providing benefits for the thriving local community and equine industry while also protecting environmental values'.</p> <p>The following strategies and actions are of key relevance:</p> <p>B1.5 Jarrahdale: Develop equine trails which support Jarrahdale in becoming a Trail Town... formalise the network of linkages and loops in Jarrahdale connecting to the northern equine hub, and develop Jarrahdale Oval into a trailhead, providing potential short stay accommodation and facilities for visitors.</p> <p>B6 Jarrahdale Bridle Trail Network: Formalise the network of bridle trail loops in Jarrahdale and upgrade the current Jarrahdale Bridle Trail and future trailhead at Jarrahdale Oval (High Priority).</p> <p>B6.5 Jarrahdale Oval Trailhead: Formalise Jarrahdale Oval as a key trailhead, providing ample float parking, seating and toilets as well as equine infrastructure such as water troughs, yards and tie-up rails.</p> <p>B10 Jarrahdale Bridle Trail to Wungong Valley Gorge Bridle Trail Link: Formalise the connecting trail from Jarrahdale Bridle Trail to Wungong Valley Gorge Bridle Trail via Old Haul Road.</p> <p>B11 Jarrahdale Strategic Links: Formalise the strategic link from Jarrahdale Oval through to Mundijong utilising the Mundijong to Jarrahdale Rail Trail and also from Jarrahdale Oval through to the western side of the Jarrahdale Town Centre utilising existing firebreaks.</p> <p>E1.1 Accommodation: Expand accommodation options (e.g. camping or caravanning) within the Shire, particularly at key locations such as the new Jarrahdale Oval Trailhead, Byford Trail Centre and Mundijong to Jarrahdale Rail Trail to facilitate the increase in visitor numbers and attract further tourism.</p> <p>E1.4 Jarrahdale Oval Trailhead and Byford Trail Centre: Develop the Jarrahdale Oval Trailhead and the Byford Trail Centre at the Byford Country Club which will enhance the tourism potential of the Shire.</p>
<p><i>Jarrahdale Trail Town Business Case and Implementation Plan (2021)</i></p>	<p>Provides strategic guidance to assist the Shire of SJ to support Jarrahdale in becoming one of WA's primary trails destinations and Perth's most popular trail town. Realignment of the Jarrahdale Equine Trail and investigation of the creation of a network of bridle trails within Jarrahdale State Forrest, starting and ending at Jarrahdale Oval trailhead, are considered high priority recommendations of this business case.</p> <p>Recommendation 3.3: Develop the Jarrahdale Oval Trail Head with a linkage into the Jarrahdale Trail Centre. This should be in line with the concept plans developed as part of the Shire of SJ Trail Development Business Case (2020) and complement, not duplicate, the functions of the Trail Centre to be established at Lot 814, Jarrahdale. This should focus as a site for commencing trail activity in this area.</p> <p>Community consultation identified that there is support in the community for establishing Jarrahdale Oval as a trailhead, provided it does not compete with local businesses and does not duplicate facilities within the township itself. Therefore it needs to be a more scaled down development with basic amenities (toilets, shelter), parking, events space etc.</p>

## Appendix 1 Background Review

Document	Key Relevant Details
<i>Shire of SJ Trail Development Business Case (2020)</i>	Three key trail projects have been identified that will provide the Shire of SJ with increased economic, employment and health benefits. These three projects include the: Mundijong to Jarrahdale Rail Trail, Jarrahdale Oval Trail Head, Byford Trail Centre. The development of the three trail projects will be highly beneficial to not only SJ's economy but also to its residents who will reap multiple health and activity benefits due to their close proximity to the proposed Mundijong to Jarrahdale Rail Trail with accompanying Jarrahdale Oval Trail Head and the Byford Trail Centre which will act as a gateway for into the Wungong Regional Park.
<i>Shire of SJ Shire Multiple Use Trails Policy (2018)</i>	Provides a planning framework that guides Council, other stakeholders and local volunteer groups in their recreation trail development activities to develop an integrated network. This policy applies to trails for walkers, cyclists, wheelchairs, horse riders and fire and emergency services. Motorised vehicles such as motorcycles are not permitted. It is noted that entrances to trails should have signs displaying the permitted users of the trail. The policy states that walkers give way to horse riders, and cyclists give way to both horse riders and walkers.

## Appendix 1 Background Review

### Best Practice Trail Design Guidelines

Topic	Details/Guidance	Source
Trailhead Location	Trailhead and campground sites should be selected based on topography that has well-drained soils and optimised road access (allowing for large vehicles with trailers) and direct access to trails.	<i>Recreational Horse Trails in Rural and Wildland Areas</i> (Wood 2007)
Trailhead Facilities	Trailheads/campgrounds should have: trailhead signage, an organised/dedicated float parking area (on hardened but not paved surfaces), rubbish bins, toilets, manure waste disposal containers, horse confinement facilities (e.g. tie stalls, hitching rails, highlines, corrals/corralling area or covered stalls), shade (natural shade preferred), and picnic tables/shelters. Tent pads may be appropriate (dependent on design/usage). Provision of water, electricity and showers is desirable, particularly at high-use campgrounds.	
Tread Conditions and Erosion Prevention	The tread surface should be firm and free of tree roots. Trail design for erosion prevention must consider soil texture, soil stoniness, soil drainage, topographic slope, the watershed area above the trail, and the nature of the water surface flow. While a soil survey map will provide an overview of the soil characteristics, there will usually be substantial variation among specific sites - this needs to be considered during both design and construction phases. Chapter 3 of <i>Recreational Horse Trails in Rural and Wildland Areas</i> (Wood 2007) provides details of key trail design principles which should guide the detailed design and construction process.	
Road Crossings	Road crossing points should be minimised as far as possible, and where required should maximise sightlines for oncoming traffic and be free of hazards (e.g. obtrusive landscaping). At major road crossings, a pegasus crossing (i.e. traffic lights with buttons for horse riders wishing to cross) or holding bays may be appropriate. Otherwise, bump rails and signage are appropriate to raise driver and trail rider awareness of the crossing point. Road crossing points should be designed at right-angles to the road. Staging areas should be provided on both sides of the road to allow space for riders to halt and assess the traffic situation before beginning the crossing.	

## Appendix 1 Background Review

Topic	Details/Guidance	Source
Road Crossings	If a trail crosses a road, this should be identified for all road users. At a basic level, a crossing may consist of warning signage, and if available, bollards with reflective tape. Traffic lights in the form of a 'pegasus crossing' may be appropriate on high volume/main roads. Horses may become impatient waiting for traffic and fidget. A rail or fence to stand the horse against while waiting assists the rider to keep the horse under control.	<i>Horse Trail Infrastructure Guidelines (2019)</i>
Hitching/Tie Up Rails and Rings	Hitching/tie up rails, rings and posts provide a heavy-duty anchor for riders to hitch their horse while not riding it. These should be designed to withstand a 750kg horse pulling back. A hitching rail accommodates 2-4 horses and should be placed at least 6m away from any other trail infrastructure, including the trail itself.	
Mounting Blocks/Ramps	Mounting blocks support riders to mount their horses. They are preferred facilities at trailheads, rest stops and gates where horse riders are likely to mount/dismount their horse. Mounting blocks/ramps enhance the accessibility of a trail, particularly where ramps provide access for people using a wheelchair.	
Trail Barriers/Control Points	Barriers and control points can be used to control access onto a trail and create a barrier to unauthorised vehicular access. Suitable barriers may include the use of cavaletti (step-overs), or in some cases bollards, posts or rocks. A cavaletti (step-over) allows safe access for horse and rider, while restricting access to motorised vehicles. It is noted that cavaletti stopovers are usually only effective where the reserve has boundary fencing, and/or natural features restricting other access points.	
Watering Points	Trailheads require an identified source for stock water. If access to mains water is unavailable it may be necessary to provide rainwater tanks that collect runoff from shelters or other structures.	



## Appendix 1 Background Review

Topic	Details/Guidance	Source
Sustainable Trail Alignments	<p>Trails that have a sustainable alignment are designed across the side slope and along the contour, perpendicular to the fall line. Sustainable trail alignments should avoid the fall line. Fall line trails follow the shortest route up or down a hill and become gullies funneling water, which strips the trail of its tread and creates deep ruts that are almost impossible to maintain.</p> <p>Sustainable trail alignments should also avoid flat terrain. The trail will become compacted and will start to collect water and create puddles and muddy sections. Where flat areas are unavoidable, trail construction techniques such as building up and crowning the trail, armouring, boardwalks can be used to mitigate surface compaction.</p>	<p><i>WA Mountain Bike Management Guidelines (2019)</i></p>
Sustainable Trail Grade	<p>A trail's grade should never exceed half the grade of the side slope it is located on. If the trail grade is more than half of the side slope grade, water will be unable to sheet off the trail and will flow down the trail causing erosion. This is known as the 'half rule' and is especially important when working with gentle slopes, as it may be assumed that gentle slopes are less susceptible to erosion, which is incorrect.</p> <p>The '10 percent rule' is based on experience and industry best practice, which has shown an average gradient of 10 percent or less is generally sustainable. This rule applies to most soil types, minimises user caused erosion, allows for design flexibility, accommodates undulations, and allows realignments above or below features.</p>	
Erosion	<p>Erosion is the most significant threat to trail surface sustainability. Erosion is accelerated by water, trail users and gravity, however poor trail design is usually the biggest culprit. Location, soil type, drainage, alignment and gradient are the most important factors affecting erosion.</p>	
Soil Type	<p>Understanding soil texture assists in predicting how trail tread will behave. Soils can change several times along trail which creates differences in trail construction and drainage requirements. Corridor evaluation should assess the suitability of soils and realign where appropriate, or identify areas that may require special attention in the detailed design process.</p>	
Dieback and Disease	<p>Trail location and alignment also plays an important part in minimising the potential spread of soil borne pathogens that cause the plant disease Phytophthora Dieback. Poorly draining trails create a higher risk for transferring Phytophthora Dieback. This pathogen causes root rot in susceptible plants by limiting or stopping the supply of water and nutrients. Over 40% of native WA plants are susceptible to Phytophthora Dieback. It is common in most of southern Australia, particularly in the jarrah forests near Perth and in the southwest of WA. Dieback is most easily spread by human movements and travel through soil movement. There is currently no practical method of eradication of the pathogen once an area is infected. The potential spread of Phytophthora Dieback can be minimised through free draining trails.</p>	

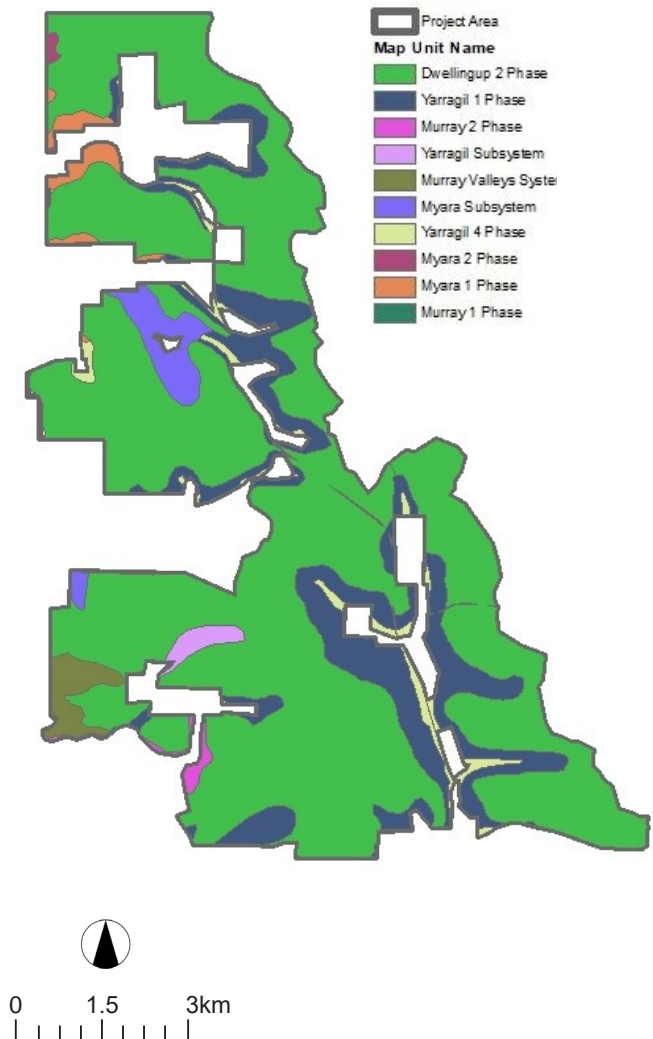
# Appendix 2 Soil Types

## Appendix 2: Soil Types

The Department of Primary Industries and Regional Development (DPIRD) publishes spatial information regarding soil landscape mapping across WA.

The following map shows the best available soil data for the project area. The following table includes a summary description of the soil types within the project area.

Soil Type	Characteristics Summary Description
<b>Dwellingup 2 Phase</b>	Very gently to gently undulating terrain (<10%) with well drained, shallow to moderately deep gravelly brownish sands, pale brown sands and earthy sands overlying lateritic duricrust.
<b>Yarragil 1 Phase</b>	Very gentle to moderately inclined concave sideslopes. Moderately well drained yellow duplex soils and yellow and brown massive earths and gravels.
<b>Murray 2 Phase</b>	Gentle to moderately inclined sideslopes (3-25%) and narrow valley floors with few areas of rock outcrop. Variable moderately well to well drained duplex and gradational soils.
<b>Yarragil Subsystem</b>	Shallow, narrow, upper valleys of the deeply dissected Murray, Bindoon and Helena units. Alluvial, clay and loam soils, moderately well drained, often gravelly, with some sands and loams. Salt prone. Woodland of E. wandoo, E. accedens.
<b>Murray Valleys System</b>	Western Darling Range from the Avon Valley to Harvey. Deeply incised valleys with red loamy earths, shallow duplexes and rock outcrop and Jarrah-marri-wandoo forest and woodland with mixed shrubland.
<b>Myara Subsystem</b>	Gentle to steep valley sideslopes and narrow incised valley floors. Variable, mostly well drained loam and clay soils. Rock outcrop. E. Wandoo and accedens and E.marginata on sandy gravel soils and Acacia spp. On shallow rocky soils.
<b>Yarragil 4 Phase</b>	Valley floors with some poorly drained mottled yellow duplex soils and gentle lower slopes with moderately well to well drained loamy and sandy earths, gravels and duplex soils. Low woodland of E. wandoo, E. marginata and Acacia spp..
<b>Myara 2 Phase</b>	Gentle to moderately inclined lower sideslopes (1-15%). Variable well drained duplex and gradational soils. Common rock outcrop. E. wandoo and accedens woodland, E. marginata on sandy gravel soils and Acacia spp. On shallow rocky soils.
<b>Myara 1 Phase</b>	Gentle to steep valley sideslopes (5-35%) and narrow incised valley floors. Variable well drained duplex and gradational soils. Common rock outcrop. E. wandoo, E.accedens and E.marginata on sandy gravels and Acacia spp. On shallow soils.
<b>Murray 1 Phase</b>	Gently undulating ridge crests and benches with slopes <20%. Shallow to moderately deep duplex and gradational soils prevail.



## Appendix 3 Trail Naming & Signage

### Appendix 3: Trail Naming & Signage

Trail names play an important role in facilitating:

- Visitors to identify and understand the nature of the trail
- Management to promote and maintain the trail
- Emergency services to access the trail and identify specific locations

Trail names are to be determined by the land manager with respect to the following considerations:

#### Consistency

Trail naming should be consistently approached throughout the network. A trail's name needs to be clearly determined to prevent confusion for management and users.

#### Relevancy

A trail's name should reflect the distinct natural and/ or cultural features of the trail. Interpretive signage may be used to reinforce the relevance of the trail's name while educating users.

#### Representation

Trail names can be used to represent basic information about the trail such as location, key features and characteristics. Non-representative trail names can be misleading.

Indigenous naming of bridle trails and trail features is strongly encouraged where appropriate and supported.

#### Trailhead Sign

A trailhead sign is the primary sign at the location where a user can access a trail and/or a network of trails. A trailhead is an important point of reference and is the appropriate location for associated trail infrastructure such as amenities, car parking and picnic facilities.

It is important that trailhead signs are professionally displayed, simple to comprehend and are expected to include:

- Trail network name & map
- Trail grade/classification
- Trail distance & estimated time
- Trail type (i.e. loop, each way, return)
- Permitted trail user/s (e.g. run/walk, horse)
- Key points of interest/amenities (e.g. scenic views, rest areas).
- Safety information (e.g. trail user conduct, emergency contact information, warnings)
- Trail manager contact details
- Website and/or QR code with further information.

Many trail users take photographs of the trailhead sign to refer to while using the trail, or (where cellular coverage allows) scan a QR code to download a trail map.

#### Waymarking Signs

Waymarkers identify the trail route and provide reassurance along the way. The amount of waymarking necessary is dependent on the grade of trail and the target user group; difficult trails designed for experienced users often require less waymarking signage although these users tend to rely more on detailed signage at the trailhead.

Waymarking signs are required at the beginning of a trail and at regular intervals along the route as well as at all intersections. Where one section of alignment is used for multiple trails, all trails should be waymarked on the same signpost with corresponding colours and/or symbols.

## Appendix 3 Trail Naming & Signage

### Directional Signs

Directional signs direct users to/from the trail to other locations/features/amenities, such as a nearby town, amenities, access point or car park. These signs are particularly relevant at intersections where users are required to choose between a number of routes. It is usually appropriate to indicate the distance to/from the identified feature/s.

Directional signage from a trail to a town can have positive economic impacts as users are more likely to impulsively visit if they are aware of the town's proximity.

### Interpretation Signs

Interpretation signs convey educational material about natural and/or cultural heritage features along a trail. They engage trail users and provide for a well-rounded trail experience. Interpretive information is appropriate at trailheads and at points of interest.

### Management/Warning Signs

Management/warning signs are used to advise trail users of dangers, risks or management policies. The sign should clearly articulate the danger, consequence, precautionary actions and use an pictograms where appropriate. These signs play an important role for both users and trail managers in the risk and safety management of a recreational trail.

### Signage Design and Placement

Key considerations:

- Waymarker plaques should be minimum size of 90mm x 90mm, with a square background.
- Waymarker arrows should be an isosceles triangle with clear and UV resistant colours.
- Signage should be installed at a height appropriate to the targeted trail users, with text/symbols sizes to suit.
- Signage style/design should be sympathetic with the landscape, with minimal adverse visual impact on natural or cultural features.
- The overuse of signs, and the use of very large signs, should be avoided.

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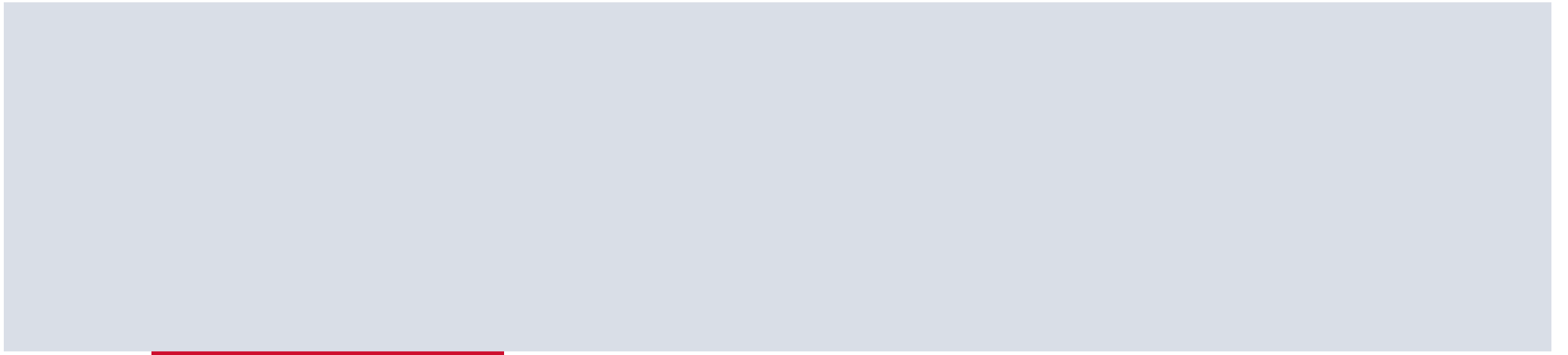
## Appendix 4 Order of Probable Costs

### **Appendix 4: Order of Probable Costs**

Rider Levitt Bucknall (Quantity Surveyors) have prepared an Order of Probable Costs for the development of the Jarrahdale Bridle Trail, based on the Concept Plan.

The Order of Probable Costs is provided over the following pages.

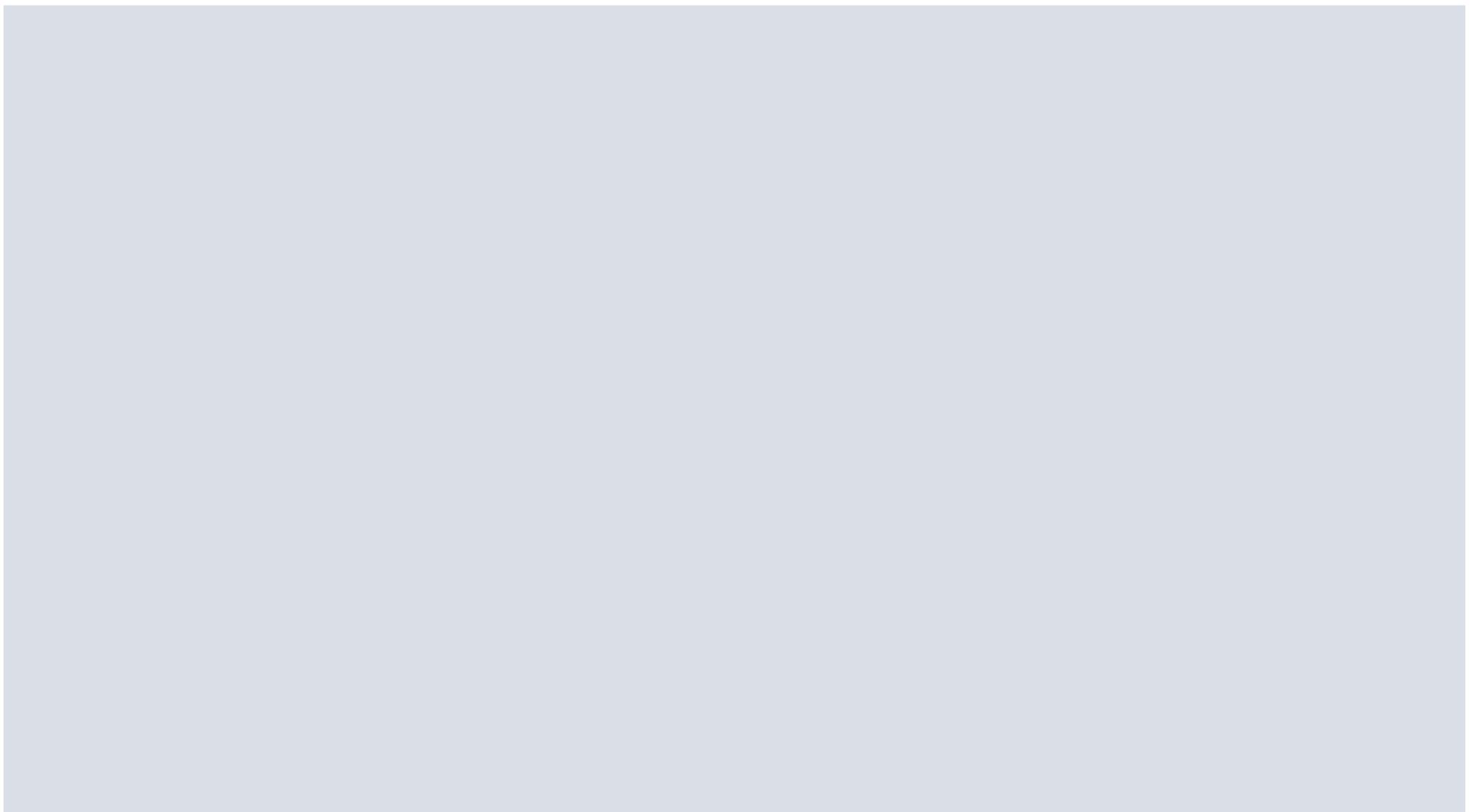
# Appendix 4 Order of Probable Costs



**ORDER OF COST ESTIMATE**

**March 2022**

## **JARRAHDALE BRIDLE TRAIL DEVELOPMENT**



# JARRAHDALE BRIDLE TRAIL DEVELOPMENT

## ORDER OF COST ESTIMATE



### PROJECT DETAILS

#### Basis of Estimate

This estimate is based upon measured quantities to which we have applied rates and conditions we currently believe applicable as at **March 2022**. We assumed that the project will be competitively tendered under standard industry conditions and form of contract.

This cost estimate is based on the documentation listed under the "Documents" section and does not at this stage provide a direct comparison with tenders received for the work at any future date. To enable monitoring of costs this estimate should be updated regularly during the design and documentation phases of this project.

#### Items Specifically Included

Contingencies & Escalation

The estimate includes the following contingency allowances:

- Design Development Contingency which allows for issues that will arise during the design and documentation period as the design team develops the design through to 100% documentation
- Construction Contingency which allows for issues that will arise during the construction period including for latent conditions, design errors and omissions, design changes, client changes, extension of time costs and provisional sum adjustments.

#### Items Specifically Excluded

The estimate **specifically excludes** the following which should be considered in an overall project feasibility study:

Project Scope Exclusions

- No allowance for annual trailhead maintenance
- No allowance for cavaletti stepover (timber)
- No allowance for rural fencing to dedicated bridle trail
- No allowance for works to existing trail corridor
- No allowance for imported materials to new trails unless stated otherwise

Risk Exclusions

- Relocation and upgrade of existing services
- Repair to any damage caused to unidentified services during the performing of the works
- Contaminated ground Removal and Reinstatement
- Removal and Reinstatement of any soft, wet and weak spots in sub-grade
- Asbestos and Hazardous Materials Removal

# JARRAHDALÉ BRIDLE TRAIL DEVELOPMENT

## ORDER OF COST ESTIMATE



### PROJECT DETAILS

- Smaller plant / equipment than tandem tipper for material supply on trail - 3m wide cleared access is assumed appropriate for tandem tipper
- Rock excavation
- Retaining walls
- Public Art
- Staging / Phasing costs

#### Other Project Cost Exclusions

- Land costs
- Legal fees
- Goods and Services Taxation
- Escalation in costs from **March 2022** to future construction period.

#### Documents

The following documents have been used in preparing this estimate:

Date Received 24/11/2021

#### ARCHITECTURAL Documents prepared by Tredwell Management Services

- Jarrahdale Bridle Trail\_Draft Concept Plan 211122
- Jarrahdale Bridle Trail\_Draft Concept Plan\_Details 211122

Date Received 18/03/2022

- Jarrahdale Bridle Trail Concept Specifications for Cost Estimate Updated after draft feedback and query 220318



## Appendix 4 Order of Probable Costs

# JARRAHDALE BRIDLE TRAIL DEVELOPMENT

## ORDER OF COST ESTIMATE



### LOCATION SUMMARY

Rates Current At March 2022

Ref	Location	Total Cost \$
<b>A</b>	<b>Jarrahdale Oval Trailhead</b>	
A1	Key Components	648,248.90
A2	Optional Components	115,478.76
	<b>A - Jarrahdale Oval Trailhead</b>	<b>763,727.66</b>
<b>C</b>	<b>Trail 1 (Class 1 / Easy Loop Trail)</b>	
C1	Key Components	216,545.28
C2	Optional Components	310,033.83
	<b>C - Trail 1 (Class 1 / Easy Loop Trail)</b>	<b>526,579.11</b>
<b>D</b>	<b>Trail 2 (Class 2 / Intermediate Loop Trail)</b>	
D1	Key Components	738,249.97
D2	Optional Components	74,875.26
	<b>D - Trail 2 (Class 2 / Intermediate Loop Trail)</b>	<b>813,125.23</b>
<b>E</b>	<b>Removal of obsolete signage</b>	<b>13,568.00</b>
<b>ESTIMATED TOTAL COST</b>		<b>2,117,000.00</b>

## Appendix 4 Order of Probable Costs

# JARRAHDALE BRIDLE TRAIL DEVELOPMENT

## ORDER OF COST ESTIMATE



### LOCATION ELEMENT ITEM

#### A Jarrahdale Oval Trailhead

A1 Key Components

Rates Current At March 2022

Ref	Description	Unit	Qty	Rate \$	Total Cost \$
<b>PR</b>	<b>Preliminaries</b>				
1	Preliminaries and supervision (10%)	Item			45,000.00
	<b>PR - Preliminaries</b>				<b>45,000.00</b>
<b>FT</b>	<b>Fitments</b>				
3	New primary trailhead sign	No	1	2,500.00	2,500.00
4	New picnic table with shelter including concrete footings	No	3	20,000.00	60,000.00
5	New picnic table only including concrete footings	No	3	5,000.00	15,000.00
8	Horse tie-up rails including concrete footings	No	6	900.00	5,400.00
10	New water trough	No	2	1,200.00	2,400.00
11	Horse waste bunker - assumed 1m high	No	1	1,500.00	1,500.00
12	New mounting block/ramp	No	1	3,200.00	3,200.00
	<b>FT - Fitments</b>				<b>90,000.00</b>
<b>XR</b>	<b>Roads, Footpaths and Paved Areas</b>				
7	Formalise existing car parking compacted gravel natural surface - with dedicated horse float area (assumed 500m2)	Item			50,000.00
	<b>XR - Roads, Footpaths and Paved Areas</b>				<b>50,000.00</b>
<b>XB</b>	<b>Outbuildings and Covered Ways</b>				
6	New amenities block complete (male/female/accessible with toilets and showers) - assumed basic construction and water / sewer mains within 100 meters (Nettleton rd)	Item			300,000.00
	<b>XB - Outbuildings and Covered Ways</b>				<b>300,000.00</b>
<b>XK</b>	<b>External Stormwater Drainage</b>				
9	New above ground water tank (10,000L)	No	1	12,000.00	12,000.00
	<b>XK - External Stormwater Drainage</b>				<b>12,000.00</b>
<b>MA</b>	<b>Builders Margin</b>				
2	Margin and overheads (5%)	Item			25,000.00
	<b>MA - Builders Margin</b>				<b>25,000.00</b>
<b>PF</b>	<b>Professional Fees</b>				
30	Professional fees (7%)	Item			42,000.00
	<b>PF - Professional Fees</b>				<b>42,000.00</b>
<b>CO</b>	<b>Contingency</b>				
28	Design contingency (7.5%)	Item			39,000.00
29	Construction contingency (7.5%)	Item			42,000.00
	<b>CO - Contingency</b>				<b>81,000.00</b>

## Appendix 4 Order of Probable Costs

### JARRAHDALÉ BRIDLE TRAIL DEVELOPMENT ORDER OF COST ESTIMATE



#### LOCATION ELEMENT ITEM

A Jarrahdale Oval Trailhead

A1 Key Components (continued)

Rates Current At March 2022

Ref	Description	Unit	Qty	Rate \$	Total Cost \$
<b>ET</b>	<b>Escalation to completion</b>				
32	Escalation	Item			Excl.
	<b>ET - Escalation to completion</b>				<b>Excl.</b>
<b>YY</b>	<b>Special Provisions</b>				
31	Statutory fees and charges (0.5%)	Item			3,248.90
	<b>YY - Special Provisions</b>				<b>3,248.90</b>
<b>KEY COMPONENTS</b>					<b>648,248.90</b>

## Appendix 4 Order of Probable Costs

### JARRAHDALÉ BRIDLE TRAIL DEVELOPMENT ORDER OF COST ESTIMATE



#### LOCATION ELEMENT ITEM

A Jarrahdale Oval Trailhead

A2 Optional Components

Rates Current At March 2022

Ref	Description	Unit	Qty	Rate \$	Total Cost \$
<b>PR</b>	<b>Preliminaries</b>				
1	Preliminaries and supervision (10%)	Item			8,000.00
	<b>PR - Preliminaries</b>				<b>8,000.00</b>
<b>FT</b>	<b>Fitments</b>				
14	Overnight horse yards 4m x 4m - fencing only	No	12	4,500.00	54,000.00
	<b>FT - Fitments</b>				<b>54,000.00</b>
<b>XB</b>	<b>Outbuildings and Covered Ways</b>				
13	New campsites - assumed not serviced	No	12	2,200.00	26,400.00
	<b>XB - Outbuildings and Covered Ways</b>				<b>26,400.00</b>
<b>MA</b>	<b>Builders Margin</b>				
2	Margin and overheads (5%)	Item			4,500.00
	<b>MA - Builders Margin</b>				<b>4,500.00</b>
<b>PF</b>	<b>Professional Fees</b>				
30	Professional fees (7%)	Item			7,500.00
	<b>PF - Professional Fees</b>				<b>7,500.00</b>
<b>CO</b>	<b>Contingency</b>				
28	Design contingency (7.5%)	Item			7,000.00
29	Construction contingency (7.5%)	Item			7,500.00
	<b>CO - Contingency</b>				<b>14,500.00</b>
<b>ET</b>	<b>Escalation to completion</b>				
32	Escalation	Item			Excl.
	<b>ET - Escalation to completion</b>				<b>Excl.</b>
<b>YY</b>	<b>Special Provisions</b>				
31	Statutory fees and charges (0.5%)	Item			578.76
	<b>YY - Special Provisions</b>				<b>578.76</b>
<b>OPTIONAL COMPONENTS</b>					<b>115,478.76</b>

## Appendix 4 Order of Probable Costs

# JARRAHDALÉ BRIDLE TRAIL DEVELOPMENT

## ORDER OF COST ESTIMATE



### LOCATION ELEMENT ITEM

C Trail 1 (Class 1 / Easy Loop Trail)  
C1 Key Components

Rates Current At March 2022

Ref	Description	Unit	Qty	Rate \$	Total Cost \$
<b>PR Preliminaries</b>					
1	Preliminaries and supervision (10%)	Item			15,000.00
	<b>PR - Preliminaries</b>				<b>15,000.00</b>
<b>FT Fitments</b>					
19	Signage on trail	No	10	750.00	7,500.00
20	Vehicle signage and management tracks (caution - horses crossing)	No	6	3,750.00	22,500.00
	<b>FT - Fitments</b>				<b>30,000.00</b>
<b>XR Roads, Footpaths and Paved Areas</b>					
17	Existing trail corridor - widening (from 1m to 1.5m) including trimming, minor grading to levels and compaction with natural site won surface	m	240	24.00	5,760.00
18	New trail corridor including clearing, trimming, minor grading to levels and compaction (1.5m wide) with natural site won surface	m	4,800	24.00	115,200.00
37	Surfacing of new 1.5m trail tread natural surface - no imported materials	m	4,800		
	<b>XR - Roads, Footpaths and Paved Areas</b>				<b>120,960.00</b>
<b>MA Builders Margin</b>					
2	Margin and overheads (5%)	Item			8,500.00
	<b>MA - Builders Margin</b>				<b>8,500.00</b>
<b>PF Professional Fees</b>					
30	Professional fees (7%)	Item			14,000.00
	<b>PF - Professional Fees</b>				<b>14,000.00</b>
<b>CO Contingency</b>					
28	Design contingency (7.5%)	Item			13,000.00
29	Construction contingency (7.5%)	Item			14,000.00
	<b>CO - Contingency</b>				<b>27,000.00</b>
<b>ET Escalation to completion</b>					
32	Escalation	Item			Excl.
	<b>ET - Escalation to completion</b>				<b>Excl.</b>
<b>YY Special Provisions</b>					
31	Statutory fees and charges (0.5%)	Item			1,085.28
	<b>YY - Special Provisions</b>				<b>1,085.28</b>
<b>KEY COMPONENTS</b>					<b>216,545.28</b>

## Appendix 4 Order of Probable Costs

### JARRAHDAL E BRIDLE TRAIL DEVELOPMENT ORDER OF COST ESTIMATE



#### LOCATION ELEMENT ITEM C Trail 1 (Class 1 / Easy Loop Trail) C2 Optional Components

Rates Current At March 2022

Ref	Description	Unit	Qty	Rate \$	Total Cost \$
<b>PR</b>	<b>Preliminaries</b>				
1	Preliminaries and supervision (10%)	Item			21,500.00
	<b>PR - Preliminaries</b>				<b>21,500.00</b>
<b>FT</b>	<b>Fitments</b>				
21	Interpretive signage along trail (i.e. flora identification)	No	4	1,200.00	4,800.00
	<b>FT - Fitments</b>				<b>4,800.00</b>
<b>XR</b>	<b>Roads, Footpaths and Paved Areas</b>				
36	Dolomite surface finish 1.5m wide tread to easy loop trail	m	5,040	42.00	211,680.00
	<b>XR - Roads, Footpaths and Paved Areas</b>				<b>211,680.00</b>
<b>MA</b>	<b>Builders Margin</b>				
2	Margin and overheads (5%)	Item			12,000.00
	<b>MA - Builders Margin</b>				<b>12,000.00</b>
<b>PF</b>	<b>Professional Fees</b>				
30	Professional fees (7%)	Item			20,000.00
	<b>PF - Professional Fees</b>				<b>20,000.00</b>
<b>CO</b>	<b>Contingency</b>				
28	Design contingency (7.5%)	Item			18,500.00
29	Construction contingency (7.5%)	Item			20,000.00
	<b>CO - Contingency</b>				<b>38,500.00</b>
<b>ET</b>	<b>Escalation to completion</b>				
32	Escalation	Item			Excl.
	<b>ET - Escalation to completion</b>				<b>Excl.</b>
<b>YY</b>	<b>Special Provisions</b>				
31	Statutory fees and charges (0.5%)	Item			1,553.83
	<b>YY - Special Provisions</b>				<b>1,553.83</b>
<b>OPTIONAL COMPONENTS</b>					<b>310,033.83</b>

## Appendix 4 Order of Probable Costs

# JARRAHDALÉ BRIDLE TRAIL DEVELOPMENT

## ORDER OF COST ESTIMATE



### LOCATION ELEMENT ITEM

D Trail 2 (Class 2 / Intermediate Loop Trail)

D1 Key Components

Rates Current At March 2022

Ref	Description	Unit	Qty	Rate \$	Total Cost \$
<b>PR</b>	<b>Preliminaries</b>				
1	Preliminaries and supervision (10%)	Item			51,500.00
	<b>PR - Preliminaries</b>				<b>51,500.00</b>
<b>FT</b>	<b>Fitments</b>				
5	New picnic table only including concrete footings	No	2	5,000.00	10,000.00
8	Horse tie-up rails including concrete footings	No	2	900.00	1,800.00
12	New mounting block/ramp	No	2	3,200.00	6,400.00
19	Signage on trail	No	35	750.00	26,250.00
20	Vehicle signage and management tracks (caution - horses crossing)	No	20	3,750.00	75,000.00
27	New viewing platform - assumed 10m2	No	2	7,500.00	15,000.00
34	Bump rails and reflective tape at crossing point	No	2	4,300.00	8,600.00
	<b>FT - Fitments</b>				<b>143,050.00</b>
<b>XR</b>	<b>Roads, Footpaths and Paved Areas</b>				
18	New trail corridor including clearing, trimming, minor grading to levels and compaction (1.5m wide) with natural site won surface	m	9,000	24.00	216,000.00
38	Drainage / erosion measures to natural surface including cut in of small swale to one side of trail	m	1,000	155.00	155,000.00
24	No allowance for works to existing trail corridor	m	12,800		Excl.
	<b>XR - Roads, Footpaths and Paved Areas</b>				<b>371,000.00</b>
<b>MA</b>	<b>Builders Margin</b>				
2	Margin and overheads (5%)	Item			28,500.00
	<b>MA - Builders Margin</b>				<b>28,500.00</b>
<b>PF</b>	<b>Professional Fees</b>				
30	Professional fees (7%)	Item			48,000.00
	<b>PF - Professional Fees</b>				<b>48,000.00</b>
<b>CO</b>	<b>Contingency</b>				
28	Design contingency (7.5%)	Item			44,500.00
29	Construction contingency (7.5%)	Item			48,000.00
	<b>CO - Contingency</b>				<b>92,500.00</b>
<b>ET</b>	<b>Escalation to completion</b>				
32	Escalation	Item			Excl.
	<b>ET - Escalation to completion</b>				<b>Excl.</b>

# Appendix 4 Order of Probable Costs

## JARRAHDALÉ BRIDLE TRAIL DEVELOPMENT ORDER OF COST ESTIMATE



### LOCATION ELEMENT ITEM

D Trail 2 (Class 2 / Intermediate Loop Trail)

D1 Key Components (continued)

Rates Current At March 2022

Ref	Description	Unit	Qty	Rate \$	Total Cost \$
<b>YY</b>	<b>Special Provisions</b>				
31	Statutory fees and charges (0.5%)	Item			3,699.97
		<b>YY - Special Provisions</b>			<b>3,699.97</b>
<b>KEY COMPONENTS</b>					<b>738,249.97</b>

Order of Cost Estimate

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## Appendix 4 Order of Probable Costs

# JARRAHDALE BRIDLE TRAIL DEVELOPMENT

## ORDER OF COST ESTIMATE



### LOCATION ELEMENT ITEM

D Trail 2 (Class 2 / Intermediate Loop Trail)

D2 Optional Components

Rates Current At March 2022

Ref	Description	Unit	Qty	Rate \$	Total Cost \$
<b>PR</b>	<b>Preliminaries</b>				
1	Preliminaries and supervision (10%)	Item			5,000.00
	<b>PR - Preliminaries</b>				<b>5,000.00</b>
<b>FT</b>	<b>Fitments</b>				
4	New picnic table with shelter including concrete footings	No	2	20,000.00	40,000.00
21	Interpretive signage along trail (i.e. flora identification)	No	10	1,200.00	12,000.00
	<b>FT - Fitments</b>				<b>52,000.00</b>
<b>MA</b>	<b>Builders Margin</b>				
2	Margin and overheads (5%)	Item			3,000.00
	<b>MA - Builders Margin</b>				<b>3,000.00</b>
<b>PF</b>	<b>Professional Fees</b>				
30	Professional fees (7%)	Item			5,000.00
	<b>PF - Professional Fees</b>				<b>5,000.00</b>
<b>CO</b>	<b>Contingency</b>				
28	Design contingency (7.5%)	Item			4,500.00
29	Construction contingency (7.5%)	Item			5,000.00
	<b>CO - Contingency</b>				<b>9,500.00</b>
<b>ET</b>	<b>Escalation to completion</b>				
32	Escalation	Item			Excl.
	<b>ET - Escalation to completion</b>				<b>Excl.</b>
<b>YY</b>	<b>Special Provisions</b>				
31	Statutory fees and charges (0.5%)	Item			375.26
	<b>YY - Special Provisions</b>				<b>375.26</b>
<b>OPTIONAL COMPONENTS</b>					<b>74,875.26</b>

## Appendix 4 Order of Probable Costs

### JARRAHDALÉ BRIDLE TRAIL DEVELOPMENT ORDER OF COST ESTIMATE



#### LOCATION ELEMENT ITEM

#### E Removal of obsolete signage

Rates Current At March 2022

Ref	Description	Unit	Qty	Rate \$	Total Cost \$
<b>PR</b>	<b>Preliminaries</b>				
1	Preliminaries and supervision (10%)	Item			1,000.00
	<b>PR - Preliminaries</b>				<b>1,000.00</b>
<b>AR</b>	<b>Alterations and Renovations</b>				
26	Removal of obsolete signage (waymarkers) promoting former Jarrahdale Bridle Trail	No	30	300.00	9,000.00
	<b>AR - Alterations and Renovations</b>				<b>9,000.00</b>
<b>MA</b>	<b>Builders Margin</b>				
2	Margin and overheads (5%)	Item			500.00
	<b>MA - Builders Margin</b>				<b>500.00</b>
<b>PF</b>	<b>Professional Fees</b>				
30	Professional fees (7%)	Item			1,000.00
	<b>PF - Professional Fees</b>				<b>1,000.00</b>
<b>CO</b>	<b>Contingency</b>				
28	Design contingency (7.5%)	Item			1,000.00
29	Construction contingency (7.5%)	Item			1,000.00
	<b>CO - Contingency</b>				<b>2,000.00</b>
<b>ET</b>	<b>Escalation to completion</b>				
32	Escalation	Item			Excl.
	<b>ET - Escalation to completion</b>				<b>Excl.</b>
<b>YY</b>	<b>Special Provisions</b>				
31	Statutory fees and charges (0.5%)	Item			68.00
	<b>YY - Special Provisions</b>				<b>68.00</b>
<b>REMOVAL OF OBSOLETE SIGNAGE</b>					<b>13,568.00</b>

## Appendix 4 Order of Probable Costs

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