

Serpentine Jarrahdale Trail Development Business Case

June 2020

Serpentine Trails





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Executive Summary



Executive Summary

The Shire of Serpentine Jarrahdale (SJ) is located within both the Perth Metropolitan region and the Peel region in Western Australia, approximately 55km southeast of Perth City.

The Shire of Serpentine Jarrahdale is transitioning into a prosperous metropolitan hub with strong country values and is home to pristine natural attractions that have the potential to attract vast amounts of tourism and economic investment, particularly through the development of new trails.

The Shire stakes claim to the title of fastest growing local government within Western Australia with the population expected to almost double over the next 16 years from its current estimated 34,523 residents in 2020 to 68,335 residents in 2036 (+97.94%). This rapid increase in population will require substantial development of SJ's existing trail network to not only cater to the new and existing residents but to also capitalise on future tourism investment.

Three key trail projects have been identified that will provide the Shire of Serpentine Jarrahdale with increased economic, employment and health benefits. These three projects include the;

- Byford Trail Centre;
- Mundijong to Jarrahdale Rail Trail, and the;
- Jarrahdale Oval Trail Head

Overall, it has been identified that the development of the three trails will attract approximately 46,745 visitors yearly who are estimated to spend approximately \$5.6 million per annum within the Shire. This is supported by approximately 36,000 local visits to the trails by locals per year and a total economic output of \$8.3 million per annum.

In addition to the economic benefits the three trails are expected to create 27 direct and 9 indirect jobs in the tourism sector and 28 direct and 22 indirect jobs in the construction sector.

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 walkers, horse riders and trail runners into the Wungong Regional Park.

A summary of the three projects has been provided on the next page:

Byford Trail Centre

Located just north of Byford's town centre, the Byford Trail Centre will sit in a reserve located on Linton Street North which borders the Wungong Regional Park. The Wungong Regional Park has been identified to become a regional hiking, mountain biking and horse riding destination.

The Byford Trail Centre is to be developed to cater to hiking and horse riding disciplines and will create important links into the Wungong Regional Park and feature rest area amenities, carparking, trail head signage and a bushwalking loop of its own.

The Byford Trail Centre will also complement the development of a future mountain biking trail centre in the neighbouring City of Armadale, as identified in the Perth and Peel Mountain Bike Strategy. The site will provide an important secondary access point to the Wungong Regional Park mountain bike trails but will not be the main hub for riders.

The identified site is located within close proximity to the Byford Country Club which has established food and beverage services through a restaurant and social facilities.

The site also boasts an additional number of benefits including:

- The potential use of the adjacently located Scout hall
- Close proximity to a rapidly growing population base and the Byford Town Centre
- Excellent accessibility for residents and visitors.

The concept plan features improved parking areas, a new shade shelter, bins, seating, shade trees, fencing, vehicle gates to prevent un-authorized access and a new walking trail with lookout structure, seating and wayfinding signage.

Based on the concept plan developed the order of cost estimate is \$1,013,260.00 with the project forecast to generate 29,820 additional visits per annum, 17 additional jobs and an increase of \$1.923m in the Gross Regional Product.

Mundijong to Jarrahdale Rail Trail

The Mundijong to Jarrahdale Rail Trail is in parts an existing rail trail which requires substantial works to ensure it meets the needs of users. The current trail essentially follows the maintenance/access track along the railway corridor. An extension of the new trail is also required into the Mundijong Township as it currently terminates where it intersects the South Western Highway.

The Rail Trail has the potential to create a family friendly and highly accessible rail trail experience for walkers, cyclists and horse riders. The development of a continuous link from Mundijong through to Jarrahdale will help to benefit local businesses. Benefits include providing a safe and relatively easy off-road connection to enable commuting between the two major towns and also provide new experiences for both locals and visitors alike. The Rail Trail will provide an opportunity to hold events such as guided walks, horse rides, cycling rides and other compatible activities.

The scope of work for this trail includes upgrading the rail trail track itself to make it safe for users, an extension of the trail, wayfinding signage, road crossing safety points and two trail heads located in Jarrahdale and Mundijong which will include shade shelters, trail head signage, seating, carparking and a horse tie up area in Mundijong. The rail trail will also feature a connection into the proposed Jarrahdale Oval Trail Head.

Based on the concept plan developed the order of cost estimate is \$9,508,550.00 with the project forecast to generate 44,660 additional visits per annum, 16 additional jobs and an increase of \$1.776m in the Gross Regional Product.

Jarrahdale Oval Trail Head

Jarrahdale Oval is a currently under utilised oval located just north of the Jarrahdale town centre in amongst dense forest. The Oval is strategically located in relation to the proposed Mundijong to Jarrahdale Rail Trail and the existing bridle trail network in Langford Park and naturally lends itself to being developed as a new trail head for the rail trail and horse riding activities.

The new Trail Head is to be located to the west of the oval on the corner of Nettleton and Millars Roads.

The proposed trail head will provide amenities including a shade shelter, picnic and bbq facilities, bike racks and bike repair station, drinking fountain and trail head signage. The trail head will also include a new pathway linking into the Jarrahdale to Mundijong Rail Trail, road crossing safety points and fencing.

Key benefits of the development of the Jarrahdale Oval Trail Head will include:

- Flow on economic benefits to businesses in the area including the Jarrahdale Township
- A purpose built area for trail users, in particular horse riders who can load and unload their horses on site
- Opportunities to hold more events at Jarrahdale Oval
- It can also be used as a marshalling area for events that attract large numbers of participants

In 1997 Jarrahdale was classified as a historic town and has a vast number of established and proposed

trails for walking, mountain biking and horse riding, giving it the potential to become a top active tourist destination within the Shire of Serpentine Jarrahdale.

Based on the concept plan developed the order of cost estimate is \$325,395.00 with the project forecast to generate 8,285 additional visits per annum, 2 additional jobs and an increase of \$0.234m in the Gross Regional Product.

For each of the projects an implementation plan has been developed that will guide the development of each project. A management plan will need to be developed for the ongoing management and maintenance of the trail projects and this is seen as a key next step.

Capital funding to develop the three projects will need to be secured. The Shire is currently seeking funding and are recommended to apply for further funding opportunities through the various sources identified in this report.



Introduction



Background

The Shire's hyper-growth is projected to continue with resident numbers anticipated to increase by 97.94% from its current estimated 34,523 residents in 2020 to 68,335 by 2036.

The Shire of Serpentine Jarrahdale sits within the Peel region of Western Australia and is located 55km southeast of Perth City. The Shire contains 13 localities, from Byford and Darling Downs in the north to Keysbrook in the southern area, including the townships of Serpentine, Byford, Mundijong and Jarrahdale. The Shire stakes claim over the title of fastest growing local government within Western Australia, and previously the fastest growing area in Australia, with significant residential population growth occurring in the past 10 years. The Shire's hyper-growth is projected to continue with resident numbers anticipated to increase by 97.94% from its current estimated 34,523 residents in 2020 to 68,335 by 2036.

Home to pristine natural attractions that are ripe for tourism investment, and exciting developments across new industrial precincts, SJ is transitioning into a prosperous metropolitan hub with a resilient community who is passionate about retaining a country-feel within a fast-paced environment. The Shire of Serpentine Jarrahdale is determined to see the exciting opportunities available grasped and capitalised on for the benefit of the growing community and visitors.

A key pillar of the Peel Economic Development Infrastructure Strategy is to close known gaps within the regions tourism offerings include (broadly) upgrading and expanding trails, and developing tourist attractions (and accommodation), and specifically the recommendation to develop a stronger trail focus, immersing visitors in natural settings, including trails, extensions and upgrades to existing trails and providing connections to amenities in towns and hubs.

Additionally, the Peel Regional Trails Strategy provides specific direction for the development of trails locally across the Shire of Serpentine Jarrahdale. The projects investigated throughout this report are highlighted within the Peel Regional Trails Strategy.

Three key trail projects have been identified for planning and development to achieve these goals being:

- Byford Trail Centre
- Mundijong to Jarrahdale Rail Trail
- Jarrahdale Oval Trail Head

This Business Case is commissioned by the Shire of Serpentine Jarrahdale and Peel Development Commission as a feasibility study for these three developments.

Strategic Context

The Shire of Serpentine Jarrahdale has recently prepared a series of strategic documents to inform a range of areas including tourism, the equine industry, trails (as part of the broader Peel Regional Trails Strategy), along with sport and active recreation more broadly. Within each of these key strategic documents trail development, promotion and management feature.

The Shire's Equine Strategy specifically identifies the Mundijong to Jarrahdale Rail Trail (Rail Trail), as an equine initiative that may foster the development of business opportunities such as cafes and associated facilities to enhance the visitor trail riding experience. With the Shire of Serpentine Jarrahdale being the leading equine region in Western Australia, this project provides an opportunity to enhance the equine branding of the Peel Region for diversified industry – A goal also outlined in the Peel Regional Investment Blueprint.

Additionally, outlined within the Peel Regional Trails Strategy, Jarrahdale Oval Trail Head is earmarked to be established as a formal trail head for equine trails, and with considered planning the Jarrahdale Oval (including the Trail Head area) has potential to host high-quality equine and other industry events. The Strategy suggests that this trail head location is of state-level significance, with high potential economic and community/tourism benefit. Ease of deliverability of this project is also classed as very high.

Highlighted within the Perth and Peel Mountain Bike Master Plan and Peel Regional Trails Strategy, the Wungong Regional Park is classified as being of national significance and a high priority to develop. The Byford Trail Centre will directly connect into the

future developments of the Wungong Regional Park and is therefore recommended as a high priority for Shire development.

Based on these identified strategic initiatives, the three trail projects required the development of a Business Case to recommend of a scope of works and develop high level concept designs for each site, scope rationale and associated estimated costs. Following this, an economic impact assessment/cost benefit analysis for each site has been developed, and an implementation plan that prioritises the development opportunities.

The WA Department of Biodiversity, Conservation and Attractions; and the WA Department of Local Government, Sport and Cultural Industries' Trail Development Series provides a framework for developing trails.

It defines three trail models being;

- Trail Town
- Trail Centre
- Trail Networks

The scope and extent of each model varies, from Trail Towns being the most sophisticated through to the basic provision of individual trails (within trail networks) and this is depicted in the table on the following page (Figure 1).

It is recommended that the following developments are designed to be consistent with the requirements for each level of trail infrastructure being;

- Byford Trail Centre – Trail Centre
- Jarrahdale Oval Trail Head – Trail Network
- Mundijong – Jarrahdale Rail Trail – Trail Network

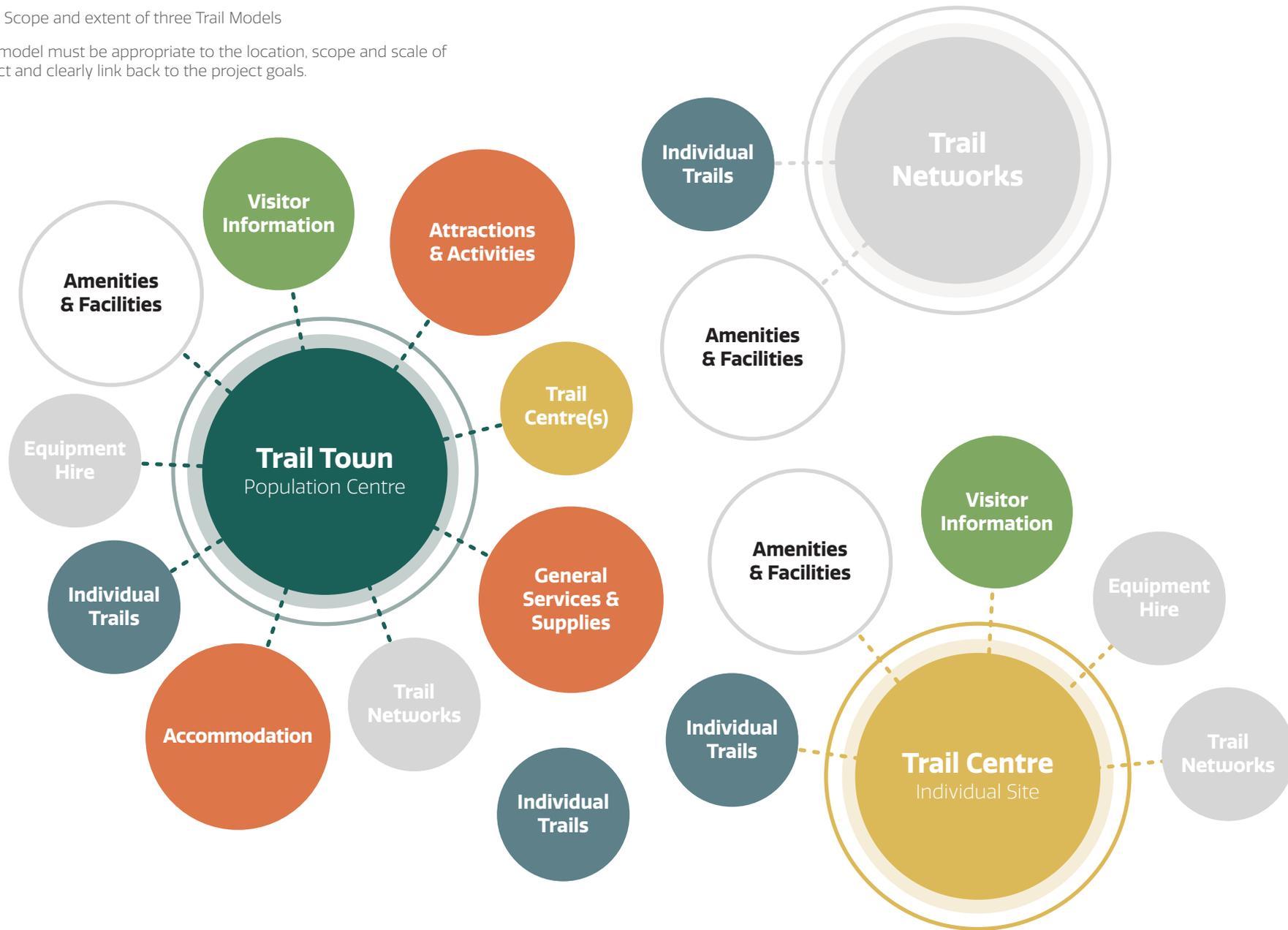
It is also recognized that the Shire district, with a unique equine industry, would benefit from the development of a Trails Town located in Jarrahdale, to celebrate the rich cultural heritage, as well as completing the market offerings of the Peel and South West trail provisions.

Although this Business Case does not provide detail for development of a Trails Town, it is recommended that this body of work is undertaken by the Shire as a priority.

Further, it is recommended that an additional trail be investigated to link Byford Trail Centre and the Mundijong Trail Head (Rail Trail). This development would provide one continuous path between Byford and Jarrahdale and is suggested that this be dedicated primarily to equine users, with mountain biking as a secondary use. Investigations of this possible trail have not been undertaken in this Business Case.

Figure 1 - Scope and extent of three Trail Models

The Trail model must be appropriate to the location, scope and scale of the project and clearly link back to the project goals.



Byford Trail Centre



Overview

The recommendations for this project are focused to the trail head area, located within Reserve 10164 Lot 2857 Linton Street North, Byford, and consideration has been given to trails extending from this area through into the Wungong Regional Park and potentially into any future large-scale developments in the Wungong Valley. This aligns with the strategic recommendations in the Perth and Peel Mountain Bike Master Plan, the Peel Regional Trails Strategy and the Shire of Serpentine Jarrahdale Local Trail Plan.

It has been identified that the Wungong Regional Park has the potential to become a regionally significant hiking and mountain biking destination. A new bushwalking loop has been identified at the Byford Trail Centre site that can be utilised by trail runners, however, the small scale of the Byford site will not allow for trail running tracks of long distances. The Byford Trail Centre will provide effective connections into the Wungong Regional Park, which will allow trail runners and bushwalkers who are wanting longer walks to access the regionally significant trails once they have been established.

It is also important to note that horse riders currently utilise the broader trail area and the connecting Wungong Regional Park. A sufficient rest area for horses and riders has been included within the Byford Trail Centre concept plan, however, similarly to trail running at the Byford site, the equine trails are mostly for providing connections into/from the Wungong Regional Park to the rest area. The hiking trail has been designed for safe interactions with the equine trails through keeping them separate and equine road safety initiatives have been considered and included in the concept design.

In addition to hiking, Wungong Regional Park has been flagged as having the potential to become a nationally/internationally significant mountain bike destination. Currently the Byford reserve includes an existing mountain bike trail which features a downhill run that receives regular use.

The Department of Biodiversity, Conservation and Attractions (DBCA) recommended against including a large scale mountain biking hub at the Byford site.

The small size of the Byford Trail Head reserve poses restrictions for the development of a national/international scale mountain bike hub as there is insufficient space available.

A pre-existing site which is currently utilised by mountain bikers as a carpark area in the neighbouring City of Armadale (located on the corner of the South Western Highway and Rails Cres) will allow for a much larger and conveniently located mountain biking trail hub of this scale.

The Byford Trail Centre will however provide an important secondary entrance for mountain bikers into the Wungong Regional Park, who will be able to utilise the existing access track to reach the park. Mountain bikers will be able to park at, and utilise the rest and shade area facilities at the Byford Trail Centre both before or following a ride in the Regional Park.

It is envisaged that the Byford Trail Centre and the future Trail Centre identified to be developed with the neighbouring City of Armadale will complement one another and provide a great experience for bushwalkers, runners, mountain bikers and horse riders.

Rationale

The characteristics of a Trail Centre have been outlined in the Western Australian Mountain Bike Strategy and can be applied to the Byford Trail Centre, these include:

- Access to population based user services and facilities (such as those located in the Byford township)
- Site based user services and facilities (such as what could be offered by the nearby Country Club)
- Associated infrastructure such as parking, shelter, picnic areas, drinking fountains etc.
- Multiple trails (such as the existing and proposed trail network within Wungong Regional Park)

The Perth and Peel Mountain Bike Master Plan further elaborates on the characteristics of a Trail Centre in that it should include visitor and trail information, amenities, potentially activity hire/repairs and a café. It is thought that there is great potential to take advantage of the nearby Country Club.

Figure 2 - Trail Centre Characteristics

	Trail Town	Trail Centre	Trail Network	Individual Trails
Population centre based user services/facilities	✓	✗	✗	✗
Site-based user services/facilities	✓	✓	✗	✗
Associated infrastructure	✓	✓	✓	✓
Multiple trails	✓	✓	✓	✗
Single trails	✗	✗	✗	✓

Design Intent

The current site at Linton Street North is heavily vegetated and without clearing limits, however, there are existing areas which are already cleared that provide a suitable area for which amenities, trail head signage, shade, picnic areas, drinking fountains, bins and seating can be provided. The proposed plan identifies new formalised parking along Linton Street North, and future parking has been proposed on the eastern side of Linton Street East in front of the existing Scout Club. This can be constructed if there proves to be sufficient demand in the future. The Byford Trail Centre will provide strong connections to both the Scout Hall and Country Club.

The site contains a number of existing informal trails which will be further developed and enhanced to form a small loop trail with a lookout point including an iconic lookout structure and a key connection to the wider Wungong Regional Park. A horse tie up area has been included and horses are directed to use the existing access track to make their way to and from the tie up area and associated amenities to the trails within the Wungong Regional Park. Mountain bikers will also be directed up the access track to the Wungong Regional Park to access the trails.

Labelled concept design plans have been provided on the following pages.

Benefits

- ✓ Strategic linkage to the Wungong Regional Park which has been identified as a priority trail network development for walking, trail running and mountain biking
- ✓ Located in close proximity to the modern Byford Country Club which has established food and beverage services through a restaurant and social facilities
- ✓ Ability to utilise existing infrastructure and amenities e.g. potentially the Scout Hall site in the future
- ✓ Pleasant setting with the option of developing an attractive lookout feature
- ✓ Close proximity to a rapidly growing population base and the Byford Town Centre including the Byford Train Station
- ✓ Accessibility for residents and visitors alike is excellent

Estimated Costs

Estimated Total Cost for the development of the Byford Trail Centre:

\$1,013,260.00

Refer to Page 4-6 of Appendix One 'Shire of Serpentine Jarrahdale Trail Development Projects - Order of Cost Breakdown' for the itemisation of all associated costs.

Byford Trail Centre

3D Visualisation





BYFORD TRAIL CENTRE PLAN 2/2

88 Linton St N, Byford WA 6122

LEGEND

- Existing Road Surface
- New Asphalt Surface (1098.4m²)
- New Pedestrian Pathway (851.9m²)
- New Kerb (179.8m²)
- New Planting Area (103.7m²)
- Existing Bushland
- New Crushed Rock Surface (2742.7m²)
- Existing Pedestrian Pathway
- Linemarking (318.6m)
- ☉ New Drinking Fountain - Commercial Systems Australia 'DF5055 TE ARI DRINKING FOUNTAIN' or similar
- ☐ New Rubbish Bin - Commercial Systems Australia 'LR6220 120L TIMBER BIN' or similar
- ☐ New Picnic Table - Commercial Systems Australia 'TM4340-41 MERNDA SETTING' or similar
- ☐ New Shade Shelter - Commercial Systems Australia 'BS8200 NORTH SHELTER' or similar
- New Signs -
 - 1 x Trail Head sign (2000x1500) Including 'You Are Here' map, trail map and connecting trail map
 - 3 x Wayfinding signs (900x900)
 - 3 x Interpretation signs (900x900)
 - 3 x New 'Warning Horses In Area' Sign for vehicles
- ⦶ New Fence - Wood Post and Rail (69m)
- New Steel Pedestrian Gate
- New Locked Steel Vehicle Gate
- New Removable Bollard (Total of x4 no.)
- ⊗ New Lookout Structure



Mundijong to Jarrahdale Rail Trail



Overview

The Mundijong to Jarrahdale Rail Trail is (in some areas) an existing rail trail which requires substantial works to ensure that it is brought up to the standard of a nationally renowned rail trail.

This includes providing substantial wayfinding, signage, parking, amenities and a safe mixed-use pathway connection. The current trail follows the maintenance/access track along the railway corridor, which runs adjacent to the rail track embankment. High quality rail trails utilize the existing tracks, and this is recommended for this project. In this case it requires burying the old rail infrastructure and resurfacing the embankment to make it suitable for users.

It is recommended to bury the existing infrastructure (with the exclusion of the rail track) as the rail sleepers have been treated with arsenic, this will have contaminated both the ballast and subgrade over time which poses a health risk to users. The disposal of the rail sleepers also add a substantial cost to the project and therefore have been allowed to remain in place, with a safe level of imported surface material and geotec layer to be applied over the top to make the trail safe for users.

The scope of work for this trail includes the required upgrades to the railway track itself as the new trail alignment, as well as recommendations for two trail heads at strategic points along the trail. Tenure constraints will need to be resolved as part of the trail development.

Rationale

The Peel Regional Trails Strategy identifies this trail as providing an opportunity for a shared-use trail including horse riding, bushwalking and off-road cycling and as such, a surface suitable for all three disciplines is required.

The Rail Trail will connect the two townships of Mundijong and Jarrahdale. There is an existing trail head at the Jarrahdale Information Bay which requires upgrading. By providing a quality surface and appropriate infrastructure such as shelters, rest stops, information and wayfinding signage, the Rail Trail will become an attractive experience on the doorstep of Perth.

Suitable for all ages and abilities (including young families) the Rail Trail will become a large driver of local business, with a total of 44,669 local, domestic day and domestic over-night visitors estimated to utilise the rail trail annually. Rail trails are generally accompanied by a visit to local cafes, shops, pubs or wineries following the completion of the trail.

Design Intent

The major requirements for this trail are to ensure there is a continuous connection from Mundijong through to Jarrahdale and to provide a high quality surface for all trail users. Two trail heads have been proposed: One based at the existing Jarrahdale Information Bay, and one new development at the trails' intersection with the South Western Highway, near Mundijong.

The Jarrahdale Information Bay redevelopment will include formalised parking, new trail head signage, amenities and shade. The Mundijong Trail Head will include parking for standard vehicles and vehicles with horse floats, a horse tie up area, new amenities and trail head signage. To traverse from the trail head to the Mundijong Town Centre, pedestrians will utilize existing footpaths, and cyclists will likely travel on-road. It is not proposed that horse riders would be encouraged to travel into the Mundijong township, due to the lack of equine amenity, instead, designated horse facilities are to be provided at the Mundijong Trail Head.

The Rail Trail itself, in addition to re-surfacing and development, will include a new rest area at the intersection with Jubb Road, Jarrahdale. Improved wayfinding, directional and safety signage will be provided at the road intersection, as well as safe crossing facilities.

This trail will provide linkages to the proposed Jarrahdale Oval Trail Head with development of connecting paths that link both trail facilities together. These linkages will cater to mountain bikers, equine trail users and hikers.

The identified alignment of the Rail Trail has been determined through on-site investigations by Tredwell along the entire length of the railway line. Alternate routes have also been explored to verify the most viable usage of the existing rail and alignment. The on-site investigations highlighted a number of considerations (detailed below) which informed the recommendation for the Rail Trail to be located along the train track itself. Considerations were made such as aligning the trail alongside the existing railway tracks, or utilizing the railway maintenance track, though these raised a number of issues as identified below:

Adjacent to railway line:

It would be very difficult to retain the existing railway tracks and align the trail directly alongside the tracks the entire length of the trail, due to the narrow width available between the outside edge of the tracks, and the embankment drop-off. The embankments on either side of the railway tracks would require an extremely large amount of retaining and fill to maintain a consistent, flat pathway. There are a number of areas where it is possible to run the trail alongside the existing tracks however there are a number of areas where it would be very difficult and costly to do so. This alignment was not considered to be viable.

Existing Maintenance Track:

The existing maintenance track does not maintain a consistent level for a rail trail, as the track dramatically varies in height. This would provide a very difficult ride/walk for users due to the steep climbs and descents. Rail trails are generally associated with being of a consistent level and are well known for appealing to mountain bike riders and walkers of all abilities due to their smooth and unchallenging nature. There are also drainage and water runoff issues - The track has large ruts and is likely to flood due to the steep and undulating terrain. This would be difficult and very costly to address in the development of the new rail trail and therefore was not deemed a viable trail alignment.

It is therefore recommended that the trail is aligned along the existing railway line.

It is also recommended that a staging plan be developed through the detailed design process for this trail, in light of the high cost to construct this trail. This would enable the Shire to build strategic sections of the trail or trail heads to spread cost.



Figure 3 - Indication of narrow available space available directly adjacent to rail way tracks for a rail trail pathway of a suitable width without importing fill and including retaining.



Figure 4 - Indication of steep and rutted maintenance track running adjacent to rail way tracks (right of image) in comparison to the flat gradient of rail way track alignment.

Benefits

- ✓ Will create a family-friendly and highly accessible rail trail experience for walkers, cyclists and horse riders
- ✓ A continuous link from Mundijong through to Jarrahdale, benefiting local businesses and providing opportunities for potential new local businesses
- ✓ Assists in activating the currently underutilised Jarrahdale Oval Precinct
A safe and relatively easy off-road connection to enable commuting between the two major towns
- ✓ Pleasant experience for locals and visitors
Opportunity to hold commercial or community events such as guided walks, horse rides, cycling rides and other compatible activities

Estimated Costs

Rail Trail:

Estimated Total Cost for the development of the Rail Trail (excluding maintenance track works):
\$8,401,550

Refer to Page 14-15 of Appendix One 'Shire of Serpentine Jarrahdale Trail Development Projects - Order of Cost Breakdown' for the itemisation of all associated costs.

Rail Trail Maintenance/Access Track:

The maintenance/access tracks cost has been provided separately to provide a more affordable staged approach to the implementation of the overall Rail Trail. This can be completed secondary

to the Rail Trail works if necessary as an existing maintenance track exists.

Estimated Total Cost for the development of the Rail Trail Maintenance/Access Track:
\$1,107,000

Refer to Page 14-15 of Appendix One 'Shire of Serpentine Jarrahdale Trail Development Projects - Order of Cost Breakdown' for the itemisation of all associated costs.

Mundijong Trail Head:

Estimated Total Cost for the development of the Mundijong Trail Head:
\$702,432

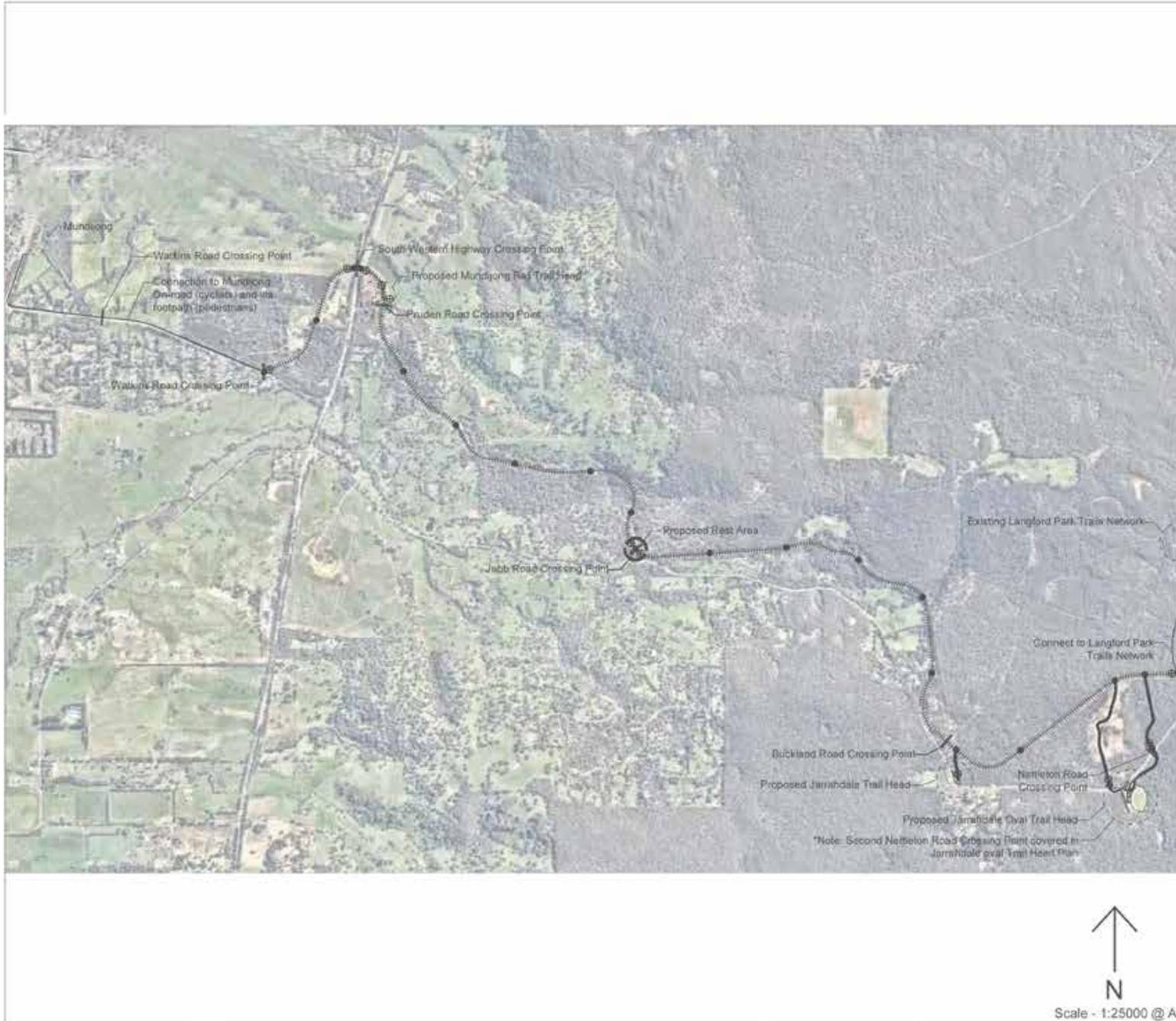
Refer to Page 11-13 of Appendix One 'Shire of Serpentine Jarrahdale Trail Development Projects - Order of Cost Breakdown' for the itemisation of all associated costs.

Jarrahdale Information Bay:

Estimated Total Cost for the redevelopment of the Jarrahdale Information Bay:
\$293,392.50

Refer to Page 9-10 of Appendix One 'Shire of Serpentine Jarrahdale Trail Development Projects - Order of Cost Breakdown' for the itemisation of all associated costs.

Total - \$10,504,374.50



RAIL TRAIL

Shire of Serpentine-Jarrahdale

LEGEND

- ==== Rail Trail Alignment
 - Length of rail line to be removed: 8.4km
 - Area of existing surface material to be removed: 35,604m²
 - Area of new granitic sand surface material: 35,604m²
 - New connection to Rail Trail from new Trail Heads
 - Total surface area for all connections to rail trail (5m wide granitic sand surface): 8,590m²
 - New Proposed Rest Area
 - 1 x New Shade Shelter - Commercial Systems Australia 'BS8200 NORTH SHELTER' or similar
 - 1x New Drinking Fountain - Commercial Systems Australia 'DF5055 TE ARI DRINKING FOUNTAIN' or similar
 - New Rubbish Bin - Commercial Systems Australia 'LR6220 120L TIMBER BIN' or similar
 - New Picnic Table - Commercial Systems Australia 'TM4340-41 MERNDA SETTING' or similar
 - 2 x Bench seats - Commercial Systems Australia 'TM4040 YARD BENCH' or similar
 - New wayfinding signs
 - 22 x wayfinding signs (900 x 900)
 - ⊕ Shared Use Path Signage and information Signage
 - x 11 Shared Use Pathway Signs
 - x 11 Informative Signs, including maps and 'You are here' markers
 - x 7 Road Crossing Safety Points
 - Post and Rail Fence to slow users. Total Post and Rail length required: 242m
 - x 2 Give Way signs per road crossing. Total Give Way signs: 14
 - x2 Warning signs for road users that there is a crossing point/intersection per road crossing. Total Warning signs: 14
 - Pedestrian Crossing Linemarking. Total Linemarking area: 51.84m²
- *Note: 9.2km Maintenance track which runs alongside to be graded and have gravel finish



MUNDIJONG TRAIL HEAD

Pruden RD, Jarrahdale, WA, 6124

LEGEND

- Existing Road Surface
- New Asphalt Surface (1522m²)
- New Pedestrian Pathway (140m²)
- New Granitic Sand Surface (686m²)
- New Planting Area* (460m²)
- New Crushed Rock Surface (859m²)
- New Crushed Gravel Surface (768m²)
- Linemarking (162m)
- x2 New Drinking Fountains - Commercial Systems Australia 'DF5055 TE ARI DRINKING FOUNTAIN' or similar
- x2 New Rubbish Bins - Commercial Systems Australia 'LR6220 120L TIMBER BIN' or similar
- x5 New Picnic Tables - Commercial Systems Australia 'TM4340-41 MERNDA SETTING' or similar
- x2 New Shade Shelters - Commercial Systems Australia 'BS8200 NORTH SHELTER' or similar
- New Signs -
 - 4 x Trail Head sign (2000x1500)
 - 2 x Warning Horses Crossing sign (800x800)
 - 1 x Warning Horses Drive Slow Sign (800x800)
- New Fence - Wood Post and Rail (93m)
- New Horse Manure Bin
- x2 kissing gates and x2 2.5m post and rail horse gates (Fencing lengths included in 'New Fence' length)



Scale - 1:800 @ A3

*Note: Include WIFI Internet capabilities at northern shelter and rest area.

**Note: Hardy Natives to eliminate need for irrigation



JARRAHDALÉ TRAIL HEAD

Intersection of Nettleton Road and Jarrahdale Road, Jarrahdale, WA, 6124

LEGEND

- Existing Road Surface
- New Asphalt Surface (61.7m²)
- New Kerb (82.4m²)
- New Pedestrian Pathway (204.3m²)
- New Granitic Sand Surface (97.3m²)
- New Planting Area (84.5m²)
Hardy Natives to eliminate need for irrigation
- Existing Bushland
- Existing Bushwalk (no works required)
- Linemarking (100m)
- New Drinking Fountain - Commercial Systems Australia 'DF5055 TE ARI DRINKING FOUNTAIN' or similar
- New Rubbish Bin - Commercial Systems Australia 'LR6220 120L TIMBER BIN' or similar
- New Picnic Table - Commercial Systems Australia 'TM4340-41 MERENDA SETTING' or similar
- New Shade Shelter - Commercial Systems Australia 'BS8200 NORTH SHELTER' or similar
- x1 New Entrance Sign (3000x1500)
- x1 New Trail Head Sign (2500x1500) Including: Map with 'you are here marker', trail information and adjoining trails.

*Note: A Community Notice Board will be included at the site under a separate project



Scale - 1:400 @ A3

Jarrahdale Oval Trail Head



Overview

The Jarrahdale Oval is located on Millars Road, Jarrahdale; and is strategically positioned in relation to the proposed Mundijong to Jarrahdale Rail Trail and the existing bridle trail network in Langford Park. The site is underutilised therefore, it is expected that development of a trail head at the site will increase activation of the area. A master plan for the site has previously been completed by the Shire and includes an event space and updated facilities, though this is not endorsed by Council as yet. The master plan identifies an area in the northwest of the site for the trail head development and also provides parking for horse floats and a warm-up track for horses. This concept design aligns to the master plan.

The proposed trail head will provide basic amenities such as shade, picnic facilities, bike racks and repair station, drinking fountain and trail head signage.

Rationale

Jarrahdale is becoming a well established trails town and provides a large number of existing and proposed trail networks for walkers, mountain bikers and equestrian riders. The strategic location of the Jarrahdale Oval in relation to the Jarrahdale township and the connections it has into the existing and proposed trail networks will create a central trail hub for a variety of users.

The Jarrahdale Oval site is already well-known and utilised heavily by the horse-riding community and lends itself well to the development of a trail head that caters to all types of users.

Alongside its connections into the Jarrahdale township and existing and proposed trails, the Jarrahdale Oval Trail Head has been conservatively estimated to hold two annual trail events. The trail head concept plan and existing master plan will work seamlessly with one another to provide a great events space for trail events, providing shade, bins, bbq facilities, horse float and car parking and also has the benefit of the sports oval to provide over flow or further events space if necessary.

It is important to note that only two annual events have been allowed for in the usage estimations, and only include those associated with trails and the trail head directly (e.g. not markets, agricultural events, sport etc.) – although these events will have the opportunity to utilise the trail head facilities.

Design Intent

The design intent is to provide necessary supporting infrastructure, amenities and facilities for all trail users including walkers, horse riders and off-road cyclists. It also intends to create linkages to nearby trail networks including the Rail Trail and Langford Park.

Benefits

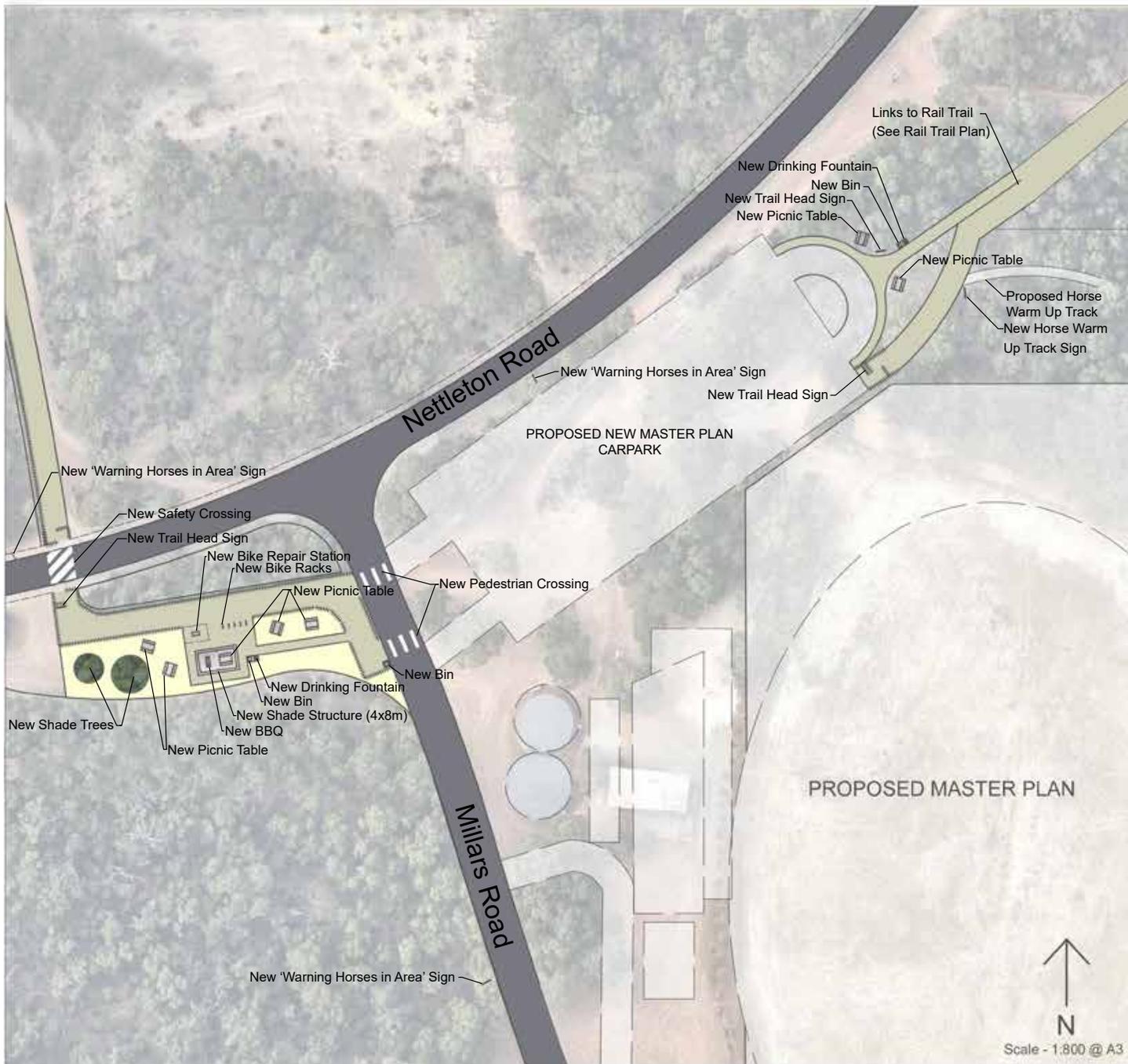
-  Increased utilisation and activation of Jarrahdale Oval
-  Flow on economic benefits to businesses in the Jarrahdale township
-  A safe and purpose-built area for trail users in particular horse riders who can safely load and unload their horses on-site
-  An opportunity to hold events at the site based on trail activities, it can also be used as a marshalling area for events that attract large numbers of participants
-  In 1997, Jarrahdale was classified as a historic town. Promoting the area as a trail town will continue to drive tourism to Jarrahdale and surrounds by providing additional activities for visitors.

Estimated Costs

Estimated Total Cost for the development of the Jarrahdale Oval Trail Head:

\$325,395.00

Refer to Page 7-8 of Appendix One 'Shire of Serpentine Jarrahdale Trail Development Projects – Order of Cost Breakdown' for the itemisation of all associated costs.

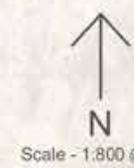


JARRAHDAL E OVAL TRAIL HEAD

86 Millars Rd, Jarrahdale WA 6124

LEGEND

- Existing Road Surface
- New Granitic Sand Surface (579.6m²)
- New Crushed Gravel Surface (1,214m²)
- Existing Bushland
- ⊗ x2 New Drinking Fountain - Commercial Systems Australia 'DF5055 TE ARI DRINKING FOUNTAIN' or similar
- x 3 New Rubbish Bin - Commercial Systems Australia 'LR6220 120L TIMBER BIN' or similar
- ▤ x 7 New Picnic Table - Commercial Systems Australia 'TM4340-41 MERNDA SETTING' or similar
- New Shade Shelter - Commercial Systems Australia 'BS8200 NORTH SHELTER' or similar
- New Signage:
 - x3 New Signs Trail Head Signs, including: Maps with 'You are Here Markers', Trail information and Trail routes
 - x1 Horse Warm Up Track Sign
 - x3 New 'Warning Horses In Area' Sign for vehicles
- ++ New Fence - Wood Post and Rail (234.79m²)
- ▤ New Outdoor Barbeque - PARKQUIP 'Park Pro Double Cabinet' or similar
- ▤ Road Crossing Safety Points
 - x 2 Give Way signs
 - x 2 Warning signs for road users that there is a crossing point/intersection
 - Pedestrian Crossing Linemarking. Total Linemarking area: 30m²
- ▤ x1 New Bicycle Rack
- ▤ x1 New Bicycle Fixing Station
- x2 New Shade Trees
 - Specie: 'Marri' - *Corymbia calophylla*



Jarrahdale Oval Trail Head 3D Visualisation



Economic Analysis

Economic Highlights

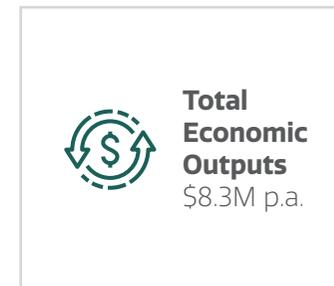
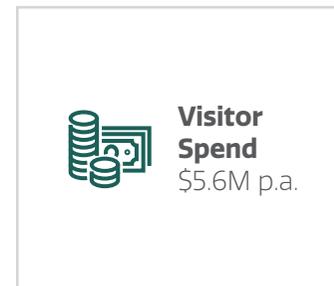
The economic analysis indicates that these developments will generate positive economic benefits both during the construction phase and the ongoing tourism and visitor economy, for all trail projects combined as indicated below.



Visitor Economy

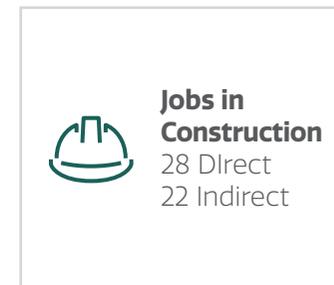


Employment Benefits



Attracting approx.
46,745 visitors
per annum

Local usage approx.
36,000 visits
per annum



Byford Trail Centre

The Byford Trail Centre is well located close to the Wungong Regional Park, with proximity to the modern Byford Country Club in a rapidly growing population area. The plan proposes trail head signage, shade, picnic areas, drinking fountains, bins, seating and parking. With these proposed developments Byford Trail Centre can become one of the gateways to Wungong Regional Park and the Shire of Serpentine Jarrahdale will experience the economic uplift associated with increasing number of walkers, trail runners, horse riders and mountain bikers.

Total visitors to Parks and Wildlife-managed parks and waters have increased from 18.67million in 2014-2015 to 20.37million in 2016-17¹, demonstrating the ongoing increase of visitors to Western Australia parks. The population of the Shire of Serpentine Jarrahdale has increased from 13,246 in 2006 to an estimated 34,523 in 2020 and is estimated to reach 68,335 people by 2036². This large growth in both visitors to parks and the population reinforces the importance of the development of the Byford Trail Centre to provide new recreational facilities and amenities for the Shire.

Visitation Assumptions

The visitation data assumes the Wungong Regional Park is fully developed as a priority trail network for walking, trail running, horse riding and mountain biking.

Tredwell Management took a conservative approach to the annual visitors to the Wungong Regional Park, based on parks of a similar trails network and well located for a day trip from a major capital city. Local usage includes residents from the Shire of Serpentine Jarrahdale using the trail network for walking, trail running and the access tracks for mountain biking and horse riding.

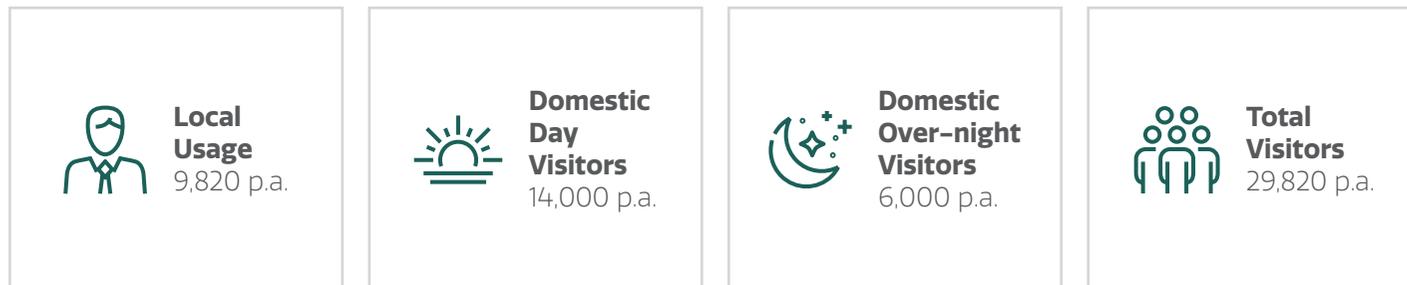
Two assumed trail running events with one thousand visitors per event were included.

More than 31,000 mountain bikers have flocked to the La Larr Ba Gauwa Park near Hardcourt since the world class facility opened in March 2018

Media Release, The Hon Lily D'Ambrosio MP, Minister for Energy, Environment and Climate Change. Minister for Solar Homes



Byford Trail Centre





Byford Trail Centre

Site Economic Assessment

The site economic assessment has been prepared using the Shire of Serpentine Jarrahdale, REMPLAN tourist impact modelling. Only visitors from outside the Shire of Serpentine Jarrahdale have been included in the economic assessment.

Based on 20,000 visitors per annum, the trail centre will generate \$4.0M of economic benefits (\$2.7M direct / \$1.3 M indirect) and create up to 17 jobs (13 direct/4 indirect). Gross Regional Product is estimated to increase by \$1.923 million (0.19%).

Cost v Benefits Analysis

The cost to develop the Byford Trail Centre is estimated to be \$1,013,260⁵, with an estimated annual maintenance cost of \$15,355 (2%). With annual benefits of \$4.1M, this equates to a pay-back period of under a year.

³ Remplan assumption \$97 expenditure per day visitor, \$231 expenditure per overnight visitor.

⁴ Supply chain is the flow on supply effect and Remplan assumed the following Type 1 economic multipliers: Output 1.340, Employment 1.231, Wages and Salaries 1.312, Value-added (GRP) 1.340.

The consumption effect assumes the following Type 2 economic multipliers: Output 1.479, Employment 1.308, Wages and Salaries 1.407, Value-added (GRP) 1.523.

⁵ Rider Levett Bucknall Rail Trail Alignment Order of Cost Estimate

⁶ To compare costs and benefits over time these have been generally weighted with different discount rates and the concept of present value. The Office of Best Practice Regulation (OBPR) recommended the use of a 7% discount rate with sensitivity analysis using discount rates of 3% and 10%. Reference - Building Better Regions Fund Round Four - Cost-Benefit Analysis Fact Sheet.

Table 1 Cost Benefit Analysis Byford Trail Centre

	Initial Investment (\$M)	Year 1 (\$M)	Year 2 (\$M)	Year 3 (\$M)
Byford Trail Centre Costs	\$0.77	\$0.02	\$0.02	\$0.02
Benefits (Direct & In-direct)	-	\$4.06	\$4.06	\$4.06
Net Benefits	(\$0.77)	\$4.04	\$4.04	\$4.04
Cumulative Benefit	(\$0.77)	\$3.27	\$7.32	\$11.36
Pay-back Period	< 1 year			

The following table shows the benefits and costs of the trail development for the Byford Trail Centre. For comparison the present value of benefits is calculated using 3 discount rates (3%, 7% and 10%).⁶

Table 2 Net Present Value over a 20-year operation period

20-year operation period	(\$M)
Initial Capital Cost	\$0.77
Asset Replacement/Maintenance (20 years)	\$0.31
Total Cost (20 years)	\$1.07
Total Benefits (20 years)	\$81.16
Net Cashflow (20 years)	\$80.09
Net Present Value @ 3% discount rate	\$59.38
Net Present Value @ 7% discount rate	\$42.06
Net Present Value @ 10% discount rate	\$33.65

Investment Opportunities

Investment opportunities associated with the Byford Trail Centre exist close to the site, with the Byford Country Club and nearby townships.

- 

Byford Country Club is located across from the proposed Trail Centre. With increased visitation to the Trail Centre from within the Shire and the connections from the neighbouring City of Armadale, the Byford Country Club will receive direct economic benefit with increased restaurant sales. Opportunities exist for the Byford Country Club to include a café as part of their facilities to cater to those using the Trail Centre.
- 

The development of the Wungong Regional Park as a fully developed priority trail network for walking, horse riding, trail running and mountain biking will increase the number of adventure tourists to the area. This would provide opportunity for trial running, mountain biking and walking accessories sales at the site.
- 

Adventure Tourism opportunities will exist for private operators to take guided mountain bike rides, walks or horse rides throughout the Wungong Regional Park commencing, stopping at or ending at the Byford Trail Centre.
- 

The Shire of Serpentine Jarrahdale is within easy access of Perth and could appeal to residents as an ideal location for a weekend getaway. This would provide investment opportunities for bed & breakfast accommodation, campgrounds and tourist villages.

Per capita annual cost of using the trails was \$209 (\$59 construction and maintenance, \$150 equipment and travel). Per capital annual direct medical benefits of using the trails was \$564. The cost benefit ratio was 2.94, which means that every \$1 investment in trails for physical activity led to \$2.94 in direct medical benefit.

A Cost-Benefit Analysis of Physical Activity Using Bike/Pedestrian Trails, Wang, G., et al., (2004) of Many Varieties of Economic Benefits linked to Trails

Mundijong to Jarrahdale Rail Trail

The Mundijong to Jarrahdale Rail Trail will be upgraded to provide a high quality surface for all trail users and will ensure a continuous connection from Mundijong to Jarrahdale. Two trail heads have been proposed along the Rail Trail: the upgrade of the existing Jarrahdale Information Bay which will include parking, signage, amenities and shade; and the development of a new trail head in Mundijong at the intersection of the railway line with the South Western Highway. The Mundijong Trail Head will include parking for standard vehicles and vehicles with horse floats, a horse tie-up area, new amenities and trail head signage.

Visitation Assumptions

Tredwell Management took a conservative approach in estimating the annual visitors to the Mundijong to Jarrahdale Rail Trail, based on similar trails well located for a day trip from a major capital city.

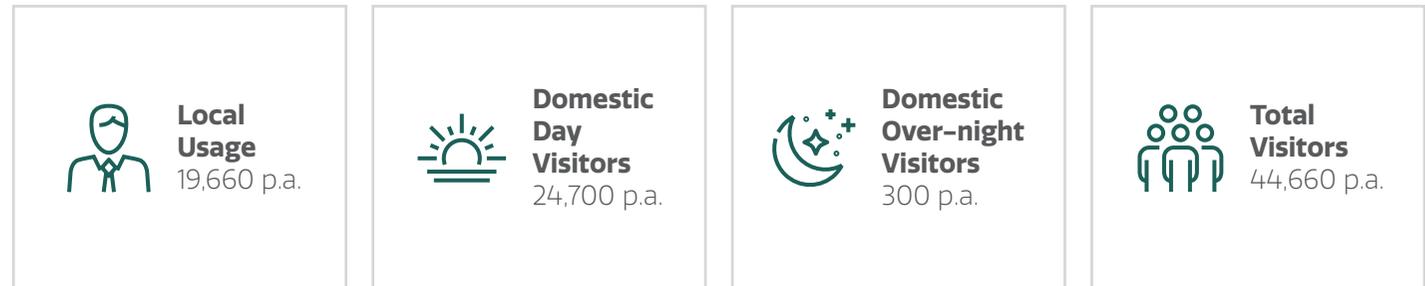
The visitation data assumes the Rail Trail is fully developed and is predominately used by trail walking, trail running, off-road cycling and trail horse-riders. The visitation data also assumes one event will be held per annum at the Rail Trail - this event could be trail walking, trail horse-riding, trail running or off-road cycling.

The Rail Trail will be available for regular use by the local community for walking (recreational), trail horse-riding, trail running and off-road cycling.

The estimated usage rates provided by Tredwell have been based off current recreational and bushwalking statistics and cycling statistics⁷ and Tredwell have made informed participation estimates for trail horse-riding based on experience and the Shire of Serpentine Jarrahdale Equine Strategy.



Mundijong to Jarrahdale Trail



Mundijong to Jarrahdale Rail Trail

Site Economic Assessment

The site economic assessment has been prepared using the Shire of Serpentine Jarrahdale, REMPLAN tourist impact modelling. Only visitors from outside the Shire of Serpentine Jarrahdale have been included in the economic assessment.

Based on 25,000 visitors per annum, the rail trail will generate \$3.7M of economic benefits (\$2.5M direct / \$1.2M indirect) and create up to 16 jobs (12 direct/4 indirect). Gross Regional Product is estimated to increase by \$1.776 million (0.17%).

Cost v Benefits Analysis

The cost to develop the Mundijong to Jarrahdale Rail Trail is estimated to be \$10,504,375¹⁰, with an estimated annual maintenance cost of \$210,087 (2%). With annual benefits of \$3.8M, this equates to a pay-back period of under 3 years.

⁸ Remplan assumption \$97 expenditure per day visitor, \$462 expenditure per overnight visitor.

⁹ Supply chain is the flow on supply effect and Remplan assumed the following Type 1 economic multipliers: Output 1.340, Employment 1.250, Wages and Salaries, 1.312, Value-added (GRP) 1.340. The consumption effect assumes the following Type 2 economic multipliers: Output 1.479, Employment 1.333, Wages and Salaries 1.407, Value-added (GRP) 1.523

¹⁰ Rider Levett Bucknall Rail Trail Alignment Order of Cost Estimate

¹¹ To compare costs and benefits over time these have been generally weighted with different discount rates and the concept of present value. The Office of Best Practice Regulation (OBPR) recommended the use of a 7% discount rate with sensitivity analysis using discount rates of 3% and 10%. Reference - Building Better Regions Fund Round Four - Cost-Benefit Analysis Fact Sheet.

Table 3 Cost Benefit Analysis Mundijong to Jarrahdale Rail Trail

	Initial Investment (\$M)	Year 1 (\$M)	Year 2 (\$M)	Year 3 (\$M)
Mundijong to Jarrahdale Rail Trail Costs	\$10.50	\$0.21	\$0.21	\$0.21
Benefits (Direct & In-direct)	-	\$3.75	\$3.75	\$3.75
Net Benefits	(\$10.50)	\$3.54	\$3.54	\$3.54
Cumulative Benefit	(\$10.50)	(\$6.97)	(\$3.43)	\$0.11
Pay-back Period	< 3 year			

The following table shows the benefits and costs of the trail development for Mundijong to Jarrahdale Rail Trail. For comparison the present value of benefits is calculated using 3 discount rates (3%, 7% and 10%)¹¹.

Table 4 Net Present Value over a 20-year operation period

20-year operation period	(\$M)
Initial Capital Cost	\$10.50
Total Cost (20 years)	\$4.20
Total Cost (20 years)	\$14.71
Total Benefits (20 years)	\$74.95
Net Cashflow (20 years)	\$60.24
Net Present Value @ 3% discount rate	\$42.12
Net Present Value @ 7% discount rate	\$26.97
Net Present Value @ 10% discount rate	\$19.61

Investment Opportunities

Investment opportunities associated with the Mundijong to Jarrahdale Rail Trail will exist for the towns of Mundijong and Jarrahdale and the wider Shire of Serpentine Jarrahdale.

- ✓ Opportunities for tourist operators to hold guided walks, horse rides and cycling rides. Increased opportunities for existing businesses already situated along, and using the Rail Trail.
- ✓ The Rail Trail will increase visitors to the townships of Mundijong and Jarrahdale, providing investment opportunities for cafes and bakeries for trail users who are seeking coffee and a light lunch after their ride or walk.
- ✓ Opportunity exists for a large annual event and multiple smaller events throughout the year.
- ✓ The Shire of Serpentine Jarrahdale is with easy access of Perth and could appeal to Perth residents as an ideal location for a weekend getaway. This would provide investment opportunities for bed & breakfast accommodation, campgrounds and tourist villages.
- ✓ Promote of the use of the Rail Trail to private tourism operators who could use the site/ facilities to create activities through the installation or showcasing of items such as vintage rail carts and train access.

Jarrahdale Oval Trail Head

The Jarrahdale Oval is well positioned in relation to the both the Mundijong to Jarrahdale Rail Trail and the existing bridle trail network in Langford Park. The proposed trail head will provide basic amenities such as shade, picnic facilities, bike racks and repair station, drinking fountain and trail head signage. Once developed the Jarrahdale Oval Trail head will provide supporting infrastructure and amenities for trail walkers, horse riders and off-road cyclists.

Visitation Assumptions

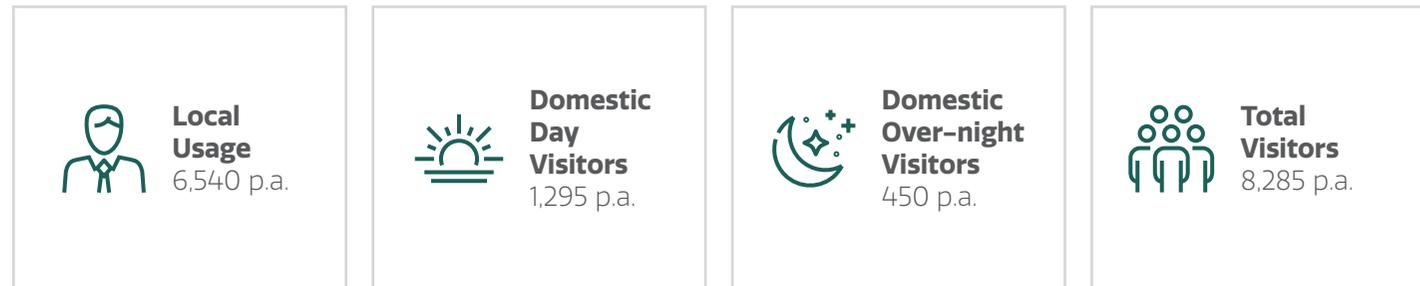
The visitation data is based only on the Trail Head development. It assumes the Jarrahdale Oval Trail Head is fully developed as per the plan and will result in increased utilisation and activation of Jarrahdale Oval, although the data is not reflective of the potential visitation to Jarrahdale Oval as an event site (for events other than trail events). Local usage to the Jarrahdale Oval Trail Head assumptions are based on participation data for horse-riding, adjusted for trail horse riding only, and participation data for cyclists - adjusted for off-road cyclists.

The Jarrahdale Oval is the start and end point of the Mundijong to Jarrahdale Rail Trail and visitors who visit both the Jarrahdale Oval and the Rail Trail in the same visit have been included in the economic analysis for the Mundijong to Jarrahdale Rail Trail. The visitor data below assumes minimal visitors from outside the region who visit the Jarrahdale Trail Head site only.

Tredwell Management took a conservative approach to estimated visitation, and assumed two annual events, with participation consistent with the current endurance equestrian event (The Jarrahdale Ride).



Jarrahdale Oval Trail Head



Jarrahdale Oval Trail Head

Site Economic Assessment

The site economic assessment has been prepared using the Shire of Serpentine Jarrahdale, REMPLAN tourist impact modelling. Only visitors from outside the Shire of Serpentine Jarrahdale have been included in the economic assessment.

Based on 1,745 visitors per annum, the Jarrahdale Oval Trail Head will generate \$0.5M of economic benefits (\$0.3M direct / \$0.2M indirect) and create up to 2 jobs (2 direct/0 indirect). Gross Regional Product is estimated to increase by \$0.234 million (0.02%).

Cost v Benefits Analysis

The cost to develop the Jarrahdale Oval Trail Head is estimated to be \$325,395¹⁴, with an estimated annual maintenance cost of \$6,508 (2%). With annual benefits of \$0.49M, this equates to a pay-back period of under 1 year.

¹² Remplan assumption \$97 expenditure per day visitor, \$462 expenditure per overnight visitor assuming a two night stay.

¹³ Supply chain is the flow on supply effect and Remplan assumed the following Type 1 economic multipliers: Output 1.340, Employment 1.000, Wages and Salaries 1.312, Value-added (GRP) 1.340. The consumption effect assumes the following Type 2 economic multipliers; Output 1.479, Employment 1.000, Wages and Salaries 1.407, Value-added (GRP) 1.523.

¹⁴ Rider Levett Bucknall Rail Trail Alignment Order of Cost Estimate

¹⁵ To compare costs and benefits over time these have been generally weighted with different discount rates and the concept of present value. The Office of Best Practice Regulation (OBPR) recommended the use of a 7% discount rate with sensitivity analysis using discount rates of 3% and 10%. Reference - Building Better Regions Fund Round Four - Cost-Benefit Analysis Fact Sheet.

Table 5 Cost Benefit Analysis Jarrahdale Oval Trail Head

	Initial Investment (\$M)	Year 1 (\$M)	Year 2 (\$M)	Year 3 (\$M)
Jarrahdale Oval Trail Head Costs	\$0.33	\$0.01	\$0.01	\$0.01
Benefits (Direct & In-direct)	-	\$0.49	\$0.49	\$0.49
Net Benefits	(\$0.33)	\$0.49	\$0.49	\$0.49
Cumulative Benefit	(\$0.33)	\$0.16	\$0.65	\$1.13
Pay-back Period	< 1 year			

The following table shows the benefits and costs of the development of the Jarrahdale Oval Trail Head. For comparison the present value of benefits is calculated using 3 discount rates (3%, 7% and 10%)¹⁵.

Table 4 Net Present Value over a 20-year operation period

20-year operation period	(\$M)
Initial Capital Cost	\$0.33
Total Cost (20 years)	\$0.13
Total Cost (20 years)	\$9.87
Total Benefits (20 years)	\$9.87
Net Cashflow (20 years)	\$9.41
Net Present Value @ 3% discount rate	\$6.92
Net Present Value @ 7% discount rate	\$4.83
Net Present Value @ 10% discount rate	\$3.82

Investment Opportunities

Investment opportunities for the Jarrahdale Oval Trail Head will be realized through additional work to build Jarrahdale into a Trails Town, however, the site specific opportunities are;

- ✔ Opportunities for tourism operators to hold guided walks, horse rides and cycling rides. Opportunity for investment into riding schools or expansion of existing riding schools.
- ✔ The Shire of Serpentine Jarrahdale has a strong equine industry with over 80 + local equine business¹⁶. Opportunities for increased sales revenue for these existing business or additional operators for local equine business (including equine suppliers (feed), Vet / Equine health professional, Agistment and Farriers).
- ✔ Opportunities to hold larger scale events at the Jarrahdale Oval which has the ability to be used as marshalling area.
- ✔ The Shire of Serpentine Jarrahdale is easily accessible to Perth and could appeal to residents as an ideal location for a weekend getaway. This would provide investment opportunities for Bed & Breakfast accommodation, campgrounds and tourist villages.



¹⁶ Shire of Serpentine Jarrahdale Equine Strategy

Social, Health & other Economic Benefits

The analysis shows the Shire of Serpentine Jarrahdale will generate positive economic benefits from construction of each recommended trail development. However, there are further non-quantitative benefits related to the mental and physical wellbeing of residents. This analysis has not quantified the economic benefit associated with health and wellbeing; however, studies are beginning to look at the links between trail use and health benefits. Examples of these include the Queensland Cycling Strategy 2017-2027 and also A Cost-Benefit Analysis of Physical Activity Using Bike/Pedestrian Trails, Wang, G., et al., (2004) of Many Varieties of Economic Benefits linked to Trails.

It is well known that participating in physical outdoor activity improves physical and mental wellbeing and provides multiple other benefits, including reduced pressure on the health system and helping to increase employee productivity. The social benefits will include bringing people together with similar interests, providing opportunity for social interaction and creating a sense of belonging in the community.

As the Rail Trail will link Mundijong to Jarrahdale, it will provide a safe and relatively easy off-road connection for users which encourages residents and visitors to use the trail, increasing physical activity. The construction of the new trail will also encourage curious residents to use the trail, and additionally, the development of a new, optional transport route between the towns will likely increase economic spending in the Shire. The economic benefits in holding events at the trail development sites are reflected within the economic assessments, however events also provide health benefits for participants and creates a sense of community pride and belonging for the local community.

This is particularly relevant within the township of Jarrahdale which is rich with heritage and culture. The trail developments here will provide a space the community can be proud of.

The Shire of Serpentine Jarrahdale is the leading equine region in Western Australia, with trail riding and recreational riding the most common equine activities¹⁶. The Shire of Serpentine Jarrahdale Equine Strategy recognised a lack of information, poor quality trails, lack of parking and current quality of facilities, as barriers to equine accessibility. The upgrade of Jarrahdale Oval Trail Head coupled with the other Serpentine Jarrahdale trail developments will provide the equine community with additional horse-riding facilities and amenities that make the Shire a more attractive place to live and visit. This has the potential to influence non-residents to relocate into the Shire, especially for horse owners, where large property sizes and a rural lifestyle support the equine identity and industry.

The establishment of a trail network nearby the community of Byford makes the town a more attractive place to live, influencing relocation decisions for the wider Perth community. As more residents make the move to the Shire, increases in property values will lead to higher rate revenue, higher buying and selling fees and increased borrowing capacity.

Trails provide a chance to preserve and enhance natural areas within the Shire, and the trails developments outlined within this report will enable residents to appreciate the natural area while having a minimal environmental impact.

On average every \$1 invested in cycling infrastructure returns almost \$5 to Queensland in health benefits, reduced traffic congestion and other benefits.

Department of Transport and Main Roads. 2016. Queensland Cycle Infrastructure Investment Strategy 2016-26 and Business Case. Brisbane. Unpublished report.

Implementation Plan



Byford Trail Centre (BTC)

Tasks (Order)	Actions	Timeframes	Partners	Cost
1	BTC1: Complete corridor evaluation of trails, and conduct a site survey (services, terrain etc.), vegetation assessment, traffic management planning, additional site investigations and detail designs of the BTC project.	Year 1	Shire External funding	\$69,500 (including design contingency)
2	BTC2: Seek funding for construction of the BTC.	Year 1	Shire Funding Bodies	Nil
3	BTC3: Seek any approvals required e.g. planning & development, indigenous/cultural and vegetation clearances.	Year 2	Shire Landscape Architect Consultants Traditional Owners (Sea and Land Council)	\$4,000
4	BTC4: Construct BTC in line with detailed designs.	Year 3	Shire Consultants Landscape/Civil Contractors Trail Builders	\$916,760* (including contingencies)
5	WTC5: Establish a management/governance structure and work collaboratively with local clubs, peak bodies, businesses (e.g. Byford Country Club), adjoining Councils, relevant government agencies and service groups to develop and activate the BTC including the development of a sustainable trail network for mountain bikers, walkers, trail runners and horse riders.	Year 3	Shire Western Australian Mountain Bike Association (WAMBA) Dept. of Environment and Conservation (DEC) City of Armadale Local Businesses Walking/Cycling/Riding Clubs	Low

*subject to change after designs are refined further

Mundijong to Jarrahdale Rail Trail (MJRT)

Tasks (Order)	Actions	Timeframes	Partners	Cost
1	MJRT1: Conduct a site survey (services, terrain etc.), vegetation assessment, traffic management planning, additional site investigations (i.e. contamination assessment) and detailed designs of the MJRT project; including staging plans.	Year 1	Shire Landscape Architect Consultants	\$949,000 (including design contingency)
2	MJRT2: Seek any approvals required including landowner approvals, planning & development, indigenous/cultural and vegetation clearances.	Year 1	Shire Consultants Alcoa Australia Traditional Owners (Sea and Land Council)	\$52,500 (does not include any cost to purchase land)
3	MJRT3: Seek funding for development of the MJRT.	Year 2	Shire Funding Bodies	Nil-Low
4	MJRT4: Construct the MJRT including the trail heads at Mundijong and Jarrahdale in-line with detailed designs.	Year 3	Consultants Landscape/Civil Contractors Trail Builders	\$9,502,874.50 total (including contingencies)*
5	MJRT5: Establish a management/governance structure and work collaboratively with local clubs, peak bodies, businesses, and service groups to activate and promote the established rail trail.	Year 3	Rail Trails Australia Local Businesses Local Walking/Cycling/Riding Clubs Alcoa Australia	Low

*subject to change after designs are refined further and staging is confirmed.

Jarrahdale Oval Trail Head (JOT)

Tasks (Order)	Actions	Timeframes	Partners	Cost
1	JOT1: Conduct a site survey (services, terrain etc.), vegetation assessment, traffic management planning, additional site investigation and detail designs of the JOT project.	Year 1	Shire Landscape Architect Consultants	\$29,500 (including design contingency)
2	JOT2: Seek funding for development of the JOT.	Year 1	Shire Funding Bodies	Low
3	JOT3: Seek any approvals required including landowner approvals, planning & development, indigenous/cultural and vegetation clearances.	Year 2	Shire Consultants Land Owners Traditional Owners (Sea and Land Council)	\$1,500
4	JOT4: Construct the JOT in line with detailed designs and broader planning for the site.	Year 3	Consultants Landscape/Civil Contractors	\$294,395* (including contingencies)
5	JOT5: Establish a management/governance structure and work collaboratively with local clubs, peak bodies, businesses, and service groups to activate and promote the Jarrahdale Oval Trail Head site.	Year 3	RDEC Local Businesses Local Walking/Cycling/Riding Clubs/Groups Australian Trail Horse Riders Association (ATHRA)	Low

*subject to change after designs are refined further

Management



Management

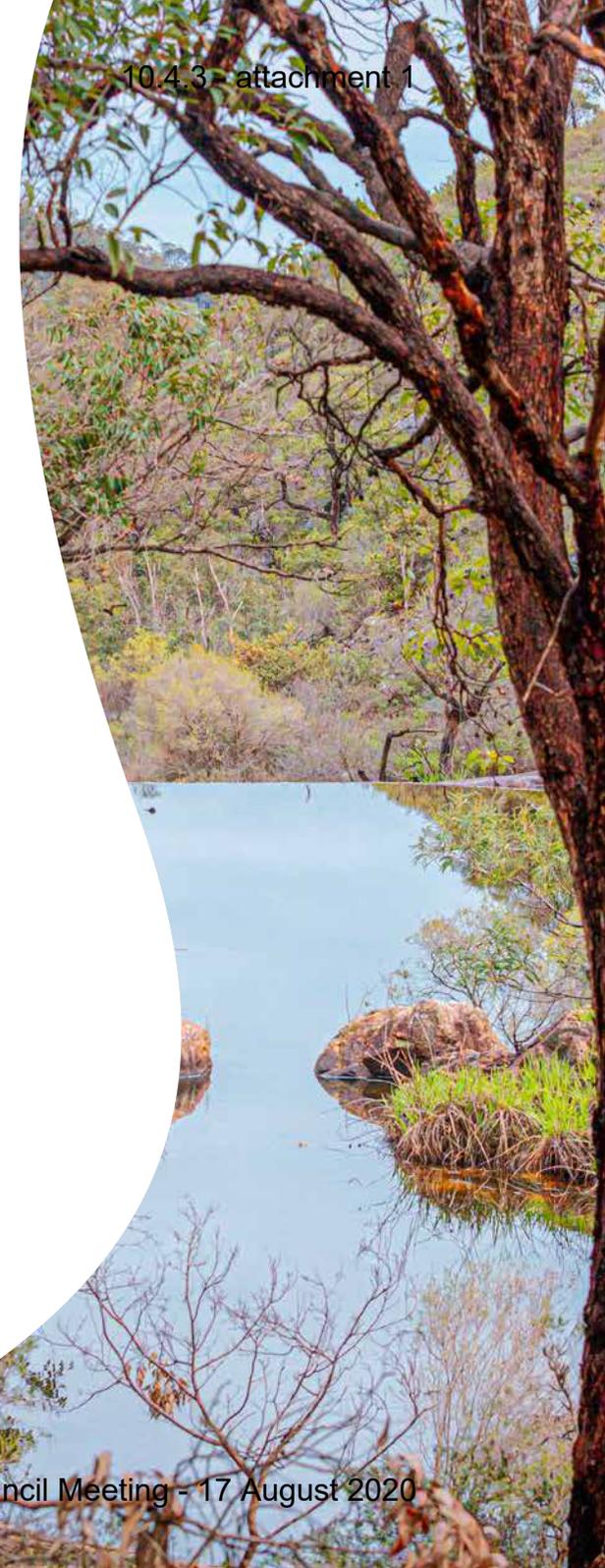
As trail management and maintenance is often a collaborative effort, it is important to identify the partners involved and to have clearly defined roles and responsibilities relating to each trail. These responsibilities can be clearly defined and agreed upon through the development of a Trail Management Plan. Formal agreements can address liability, which is a common constraint for trail developments across varied land tenures.

The Management Plan for each trail needs to identify partners in management and/or maintenance and clearly defined roles and responsibilities. This could be agreed upon through a Memorandum of Understanding, a formal partnership agreement or a trail licensing agreement through Council which can assist landowners to manage risk and liability.

An effective management model may include the establishment of a Trail Management Committee working with local government or other public authorities under a Memorandum of Understanding for management of the trail.

The roles and responsibilities of such a Committee could include:

- Strategic management of the trail and its ongoing development
- Development and implementation of relevant planning and policy governing the trails operation
- Ensuring standardisation of the trail
- Advocacy and submission to Council and other external organisations for budgeting and external funding for future development, operation and marketing of the trail
- Ensure the quality of the trail and its facilities are maintained to the agreed service level
- Aid in the development process of the trail
- Operate within and be accountable for approved budgets



Funding Opportunities



Funding Opportunities

A variety of funding sources are available for the development of sporting and community facilities and are identified below. These programs change regularly and it is important to contact the funding agency/organisation to get up to date details on guidelines and project eligibility.

Local Government

In addition to the normal capital works budget and developer contribution reserves, Council may be able to borrow funds specifically to conduct the project.

Department of Local Government, Sport and Cultural Industries

The Department is the key driver in developing the WA Strategic Trails Blueprint and a key supporter of Trails WA. They also manage the Lotterywest Trails Funding Program which allocates around \$1million per annum to plan, build and develop trails in WA. Refer www.dsr.wa.gov.au

It is important to note that due to Covid-19 this funding source may be affected, it is recommended to monitor the Department of Local Government, Sport and Cultural Industries website and reach out to them before applying as situations may change in this uncertain time.

Australian Sports Foundation

Fundraising4Sport –raises funds through tax deductible donations for organisations and athletes around Australia. Fundraising4Sport also allowing access to a Community Fundraising platform.

Federal Government

The federal government from time to time provides funding for community facilities. For example, in 2018-2019, \$30million was spent to deliver up to 500 local community sporting infrastructure developments – up to \$500,000 each – to improve community sporting facilities. The Federal Government has a role to contribute towards the redevelopment from a regional and economic development, health and social cohesion perspective.

It is important to note that due to Covid-19 the Federal Government funding source may be affected, it is recommended to contact them before applying for funding as situations may change in this uncertain time.

Trusts and Foundations

There are numerous trusts and foundations established in Australia with a number providing funding for sport and recreation projects. Often, they are established by large corporations. Refer www.philanthropy.org.au

Commercial and Private Sector Funding

Commercial and private sector funding is often used by sporting organisations to assist with facility developments and ongoing operations. Opportunities such as facility naming rights and in-kind donations are a potential resource for new

Peak Bodies, Associations and Clubs

Club and association contributions toward facility development and other initiatives is common. This may include funds generated through fundraising, loans and savings. Peak bodies and associations may also have funds which could be contributed towards the projects.

Royalties for Regions

Royalties for Regions underpins the State Government's long-term commitment to developing Western Australia's regional areas into strong and vibrant regional communities that are desirable places to live, work and invest. Royalties for Regions promotes and facilitates economic, business and social development in regional Western Australia for the benefit of all Western Australians. Since December 2008, Royalties for Regions has invested over \$6.9 billion into over 3,700 projects to improve infrastructure and services across regional Western Australia.

Royalties for Regions focuses on delivering benefits to regional WA through six objectives:

1. Building capacity in regional communities
2. Retaining benefits in regional communities
3. Improving services to regional communities
4. Attaining sustainability
5. Expanding opportunity
6. Growing prosperity.

Refer www.drd.wa.gov.au/rfr/

Next Steps



Further Considerations

Further considerations to be addressed when progressing the Serpentine Jarrahdale Trail Development Business Case include:



Council to consider
the feasibility of the projects



Corridor evaluation phase
of Council's selected project



Investigating water supplies
for drinking fountains,
vegetation and turf



Refine
concept designs



External funding
to be advocated for



Consider a re-alignment
of the Mundijong – Jarrahdale Rail Trail
to bypass the Keirnan Park Recreation
Precinct site, and additionally, a trail
between the Byford Trail Centre and the
Mundijong Trail Head be investigated to
create connection across townships.



Jarrahdale Trails Town plan
be investigated and completed
to fully capitalise on
Jarrahdale's unique offerings

Appendices

Appendices

Appendix One: QS Costings

Appendix Two: REMPLAN reports

Appendix One

Order of Cost Estimate

ORDER OF COST ESTIMATE

JUNE 2020

**SHIRE OF SERPENTINE JARRAHDALE TRAIL DEVELOPMENT
PROJECTS**

Shire of Serpentine Jarrahdale Trail Development Projects

Order of Cost Estimate

Project Details

Description

Basis of Estimate

This estimate is based upon measured quantities to which we have applied rates and conditions we currently believe applicable as at **June 2020**. 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.

COVID-19 Impact

Our estimate has been prepared on the basis of normal economic and industry circumstances. The full impact of COVID-19 is unknown at this stage and changing daily. Our estimate makes no provision for the impacts of COVID-19 virus and we advise that an impact on the estimate is probable and could vary considerably depending on the extent of a variety of issues. These may include but are not limited to the following issues, which are intended as a guide as opposed to a comprehensive list:

- Economy, industry and society shut down
- Exchange rate fluctuations (our estimate reflects pricing as at the US\$0.70 market exchange rate).
- Off shore manufacturing capacity and delivery timing
- On shore site deliveries of plant, materials and equipment
- On site staff to manage productivity of the works
- On site labour to implement the works

RLB has observed that, for key construction components, there is an increasing reluctance by contractors to commit to a definitive programme or cost for future projects. This estimate does not consider increased project costs due to potential programme delays, alternative procurement methods of materials and/or labour nor the wider potential impact of COVID-19 on construction activities.

Potential COVID-19 Actions

RLB recommends that a project contingency provision is made for COVID-19 impacts dependent of the status of the design and delivery cycle of the project. We would be pleased to discuss suitable provisions.

RLB recommends undertaking a risk analysis of this issue and we would be pleased to assist in the preparation of an order of cost assessment and/or sensitivity analysis for the project based on defined criteria. Our new programming capability can also be of assistance in these matters.

Please let us know if you would like RLB to assist with a sensitivity analysis on the exchange rate fluctuations to inform on the impact of the current exchange rate and potentially include in any additional COVID-19 project contingency.

RLB anticipate that the impact on the estimate may only be in the short to medium term and that long-term impacts may revert to normal circumstances but this will be subject to ongoing monitoring.

Items Specifically Included

Contingencies & Escalation

The estimate includes the following contingency allowances:

Shire of Serpentine Jarrahdale Trail Development Projects

Order of Cost Estimate

Project Details

Description

- 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:

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
- Rock excavation
- Removal of rail sleepers
- Removal of rail ballast
- Retaining walls
- Public Art
- Staging / Phasing costs

Other Project Cost Exclusions

- Land costs
- Legal fees
- Goods and Services Taxation
- Escalation in costs from **February 2020** to future construction period.

Documents

The following documents have been used in preparing this estimate:

	Date Received
<u>Documents prepared by Tredwell Management</u>	
■ Byford Trial Centre Plan 1/2 Rev2	27/11/19
■ Byford Trial Centre Plan 2/2	08/10/19
■ Rail Trail Plan 1/1	08/10/19
■ Mundijong Trail Head Plan 1/1 Rev2	27/11/19
■ Jarrahdale Trail Head Plan 1/1 Rev2	27/11/19
■ Jarrahdale Oval Trail Head Plan 1/1	10/10/19

Shire of Serpentine Jarrahdale Trail Development Projects

Order of Cost Estimate

Location Summary

Rates Current At June 2020

Location	Total Cost
A BYFORD TRAIL CENTRE	1,013,260.00
B JARRAHDALE OVAL	325,395.00
C JARRAHDALE TRAIL HEAD	293,392.50
D MUNDIJONG TRAIL HEAD	702,432.00
E RAIL TRAIL	9,508,550.00
ESTIMATED TOTAL COST	\$11,843,029.50

Shire of Serpentine Jarrahdale Trail Development Projects

Order of Cost Estimate

Location Elements Item

A BYFORD TRAIL CENTRE

Rates Current At June 2020

Description	Unit	Qty	Rate	Total
FT Fitments				
21 Signage 2000 x 1500 Trail head sign	No	1	1,100.00	1,100.00
22 Signage 900x900 wayfinding / interpretation signs	No	9	650.00	5,850.00
60 Supply and install removable bollard including cast-in sleeve and concrete foundation	No	4	1,000.00	4,000.00
Fitments				\$10,950.00
SF Sanitary Fixtures				
14 Drinking fountain 'DF5055 TE ARI Drinking Fountain'	No	1	3,500.00	3,500.00
Sanitary Fixtures				\$3,500.00
BW Builders Work in Connection With Specialist Services				
1 Builders work in connection with services	Item			2,500.00
Builders Work in Connection With Specialist Services				\$2,500.00
XP Site Preparation				
29 Allowance to clear existing shrubs and topsoil and dispose on site	m ²	7,181	5.00	35,905.00
31 Allowance to remove trees	Item			20,000.00
Site Preparation				\$55,905.00
XR Roads, Footpaths and Paved Areas				
8 50mm Thick asphalt pavement including boxing out, basecourse etc.	m ²	1,172	85.00	99,620.00
9 Pedestrian Pathway including boxing out, basecourse etc.	m ²	396	115.00	45,540.00
10 Site kerbing including base prep, basecourse etc. - Details TBA	m	322	105.00	33,810.00
12 200mm Thick compacted crushed rock path including boxing out, basecourse etc.	m ²	2,772	35.00	97,020.00
13 Line marking to car park	m ²	1,172	2.50	2,930.00
26 Allowance for pram ramps	No	2	1,200.00	2,400.00
27 Allowance for raised wombat crossing	No	1	4,500.00	4,500.00
32 Allowance for fill to roadside car parking	Item			7,500.00
36 Allowance to re sheet the section of road between car park entre and northen end of roadside car parks	m ²	327	40.00	13,080.00
Roads, Footpaths and Paved Areas				\$306,400.00
XN Boundary Walls, Fencing and Gates				
23 Wood post and rail fence	m	122	195.00	23,790.00
24 Steel pedestrian gate	No	1	1,200.00	1,200.00
25 Steel vehicle gate	No	1	2,800.00	2,800.00
64 Steel horse gate	No	1	2,800.00	2,800.00
65 Kissing gate	No	1	2,200.00	2,200.00
33 Allowance to remove existing western wood post fence	m	59	25.00	1,475.00
Boundary Walls, Fencing and Gates				\$34,265.00

Shire of Serpentine Jarrahdale Trail Development Projects

Order of Cost Estimate

Location Elements Item

A BYFORD TRAIL CENTRE (continued)

Rates Current At June 2020

Description	Unit	Qty	Rate	Total
XB Outbuildings and Covered Ways				
17 4000mm x 4000mm Shade shelter 'BS8200 North Shelter'	No	1	15,000.00	15,000.00
20 Iconic lookout structure - as advised by Tredwell Management on 09/06/20	No	1	200,000.00	200,000.00
Outbuildings and Covered Ways				\$215,000.00
XL Landscaping and Improvements				
11 Cultivated organic mulch planting beds not including irrigation	m ²	106	75.00	7,950.00
15 Rubbish bin LR6220 120L Timber Bin	No	1	2,500.00	2,500.00
16 Picnic table 'TM4340-41 Mernda Setting'	No	2	3,500.00	7,000.00
18 Boulder seats	No	4	450.00	1,800.00
19 2500mm Long bench seat 'TM4040 Yard bench'	No	1	1,200.00	1,200.00
30 Allowance for planting to garden beds (4 plants per m2)	m ²	106	45.00	4,770.00
Landscaping and Improvements				\$25,220.00
XK External Stormwater Drainage				
68 Allowance for stormwater to asphalt pavement including excavation, bedding, pipework, pits and backfill	m ²	1,172	45.00	52,740.00
34 No allowance for stormwater to general pavement types - assumed only asphalt car park	Item			Excl.
External Stormwater Drainage				\$52,740.00
XW External Water Supply				
28 Allowance for water supply to drinking fountain including pipework, trenching, bedding and backfill	m	108	35.00	3,780.00
External Water Supply				\$3,780.00
XE External Electric Light and Power				
35 Limited lighting to carpark	Item			10,000.00
External Electric Light and Power				\$10,000.00
PR Preliminaries				
2 Preliminaries and supervision (10%)	Item			72,000.00
Preliminaries				\$72,000.00
MA Builders Margin				
3 Margin and overheads (10%)	Item			79,000.00
Builders Margin				\$79,000.00
CT Contingency				
4 Design contingency (5%)	Item			43,500.00
5 Construction contingency (5%)	Item			45,500.00
Contingency				\$89,000.00
PF Professional Fees				
6 Professional fees (5%)	Item			48,000.00
Professional Fees				\$48,000.00

Shire of Serpentine Jarrahdale Trail Development Projects

Order of Cost Estimate

Location Elements Item

A BYFORD TRAIL CENTRE (continued)

Rates Current At June 2020

Description	Unit	Qty	Rate	Total
ST Statutory Charges				
7 Statutory fees and charges (0.5%)	Item			5,000.00
			Statutory Charges	\$5,000.00
			BYFORD TRAIL CENTRE	\$1,013,260.00

Shire of Serpentine Jarrahdale Trail Development Projects

Order of Cost Estimate

Location Elements Item

B JARRAHDAL OVAL

Rates Current At June 2020

Description	Unit	Qty	Rate	Total
FT Fitments				
21 Signage 2000 x 1500 Trail head sign	No	4	1,100.00	4,400.00
22 Signage 900x900 wayfinding / interpretation signs	No	3	650.00	1,950.00
40 Bike station	No	5	950.00	4,750.00
41 BBQ - details TBA	No	1	7,500.00	7,500.00
47 Bike repair station	No	1	1,500.00	1,500.00
Fitments				\$20,100.00
SF Sanitary Fixtures				
14 Drinking fountain 'DF5055 TE ARI Drinking Fountain'	No	2	3,500.00	7,000.00
Sanitary Fixtures				\$7,000.00
BW Builders Work in Connection With Specialist Services				
1 Builders work in connection with services	Item			2,500.00
Builders Work in Connection With Specialist Services				\$2,500.00
XR Roads, Footpaths and Paved Areas				
12 200mm Thick compacted crushed rock path including boxing out, basecourse etc.	m ²	1,833	35.00	64,155.00
45 Line marking for pedestrian crossing	No	2	200.00	400.00
27 Allowance for raised wombat crossing	No	1	4,500.00	4,500.00
46 Allowance to re sheet Millars road adjacent Jarrahdale oval	m ²	973	40.00	38,920.00
43 No allowance for site kerbing	Item			Excl.
Roads, Footpaths and Paved Areas				\$107,975.00
XN Boundary Walls, Fencing and Gates				
23 Wood post and rail fence	m	176	195.00	34,320.00
Boundary Walls, Fencing and Gates				\$34,320.00
XB Outbuildings and Covered Ways				
37 4000mm x 8000mm Shade shelter 'BS8200 North Shelter'	No	1	22,000.00	22,000.00
Outbuildings and Covered Ways				\$22,000.00
XL Landscaping and Improvements				
15 Rubbish bin LR6220 120L Timber Bin	No	3	2,500.00	7,500.00
16 Picnic table 'TM4340-41 Mernda Setting'	No	7	3,500.00	24,500.00
39 Shade trees 'Marri's corymbia calophylla'	No	2	1,000.00	2,000.00
Landscaping and Improvements				\$34,000.00
XK External Stormwater Drainage				
34 No allowance for stormwater to general pavement types - assumed only asphalt car park	Item			Excl.
External Stormwater Drainage				Excl.
XW External Water Supply				
28 Allowance for water supply to drinking fountain including pipework, trenching, bedding and backfill	m	69	35.00	2,415.00
External Water Supply				\$2,415.00

Shire of Serpentine Jarrahdale Trail Development Projects

Order of Cost Estimate

Location Elements Item

B JARRAHDALE OVAL (continued)

Rates Current At June 2020

Description	Unit	Qty	Rate	Total
XG External Gas				
44 Allowance for gas supply to BBQ	m	31	35.00	1,085.00
			External Gas	\$1,085.00
PR Preliminaries				
2 Preliminaries and supervision (10%)	Item			23,000.00
			Preliminaries	\$23,000.00
MA Builders Margin				
3 Margin and overheads (10%)	Item			25,500.00
			Builders Margin	\$25,500.00
CT Contingency				
4 Design contingency (5%)	Item			14,000.00
5 Construction contingency (5%)	Item			14,500.00
			Contingency	\$28,500.00
PF Professional Fees				
6 Professional fees (5%)	Item			15,500.00
			Professional Fees	\$15,500.00
ST Statutory Charges				
7 Statutory fees and charges (0.5%)	Item			1,500.00
			Statutory Charges	\$1,500.00
			JARRAHDALE OVAL	\$325,395.00

Shire of Serpentine Jarrahdale Trail Development Projects

Order of Cost Estimate

Location Elements Item

C JARRAHDAL TRAIL HEAD

Rates Current At June 2020

Description	Unit	Qty	Rate	Total
FT Fitments				
21 Signage 2000 x 1500 Trail head sign	No	1	1,100.00	1,100.00
53 3000mm x 1500mm Entrance sign	No	1	2,000.00	2,000.00
Fitments				\$3,100.00
SF Sanitary Fixtures				
14 Drinking fountain 'DF5055 TE ARI Drinking Fountain'	No	1	3,500.00	3,500.00
Sanitary Fixtures				\$3,500.00
BW Builders Work in Connection With Specialist Services				
1 Builders work in connection with services	Item			2,500.00
Builders Work in Connection With Specialist Services				\$2,500.00
XR Roads, Footpaths and Paved Areas				
8 50mm Thick asphalt pavement including boxing out, basecourse etc.	m ²	691	85.00	58,735.00
9 Pedestrian Pathway including boxing out, basecourse etc.	m ²	206	115.00	23,690.00
10 Site kerbing including base prep, basecourse etc. - Details TBA	m	192	105.00	20,160.00
13 Line marking to car park	m ²	691	2.50	1,727.50
54 Allowance to clear existing site including asphalt, fencing, kerbing, signage, trees and shrubs	m ²	1,201	10.00	12,010.00
Roads, Footpaths and Paved Areas				\$116,322.50
XB Outbuildings and Covered Ways				
17 4000mm x 4000mm Shade shelter 'BS8200 North Shelter'	No	1	15,000.00	15,000.00
Outbuildings and Covered Ways				\$15,000.00
XL Landscaping and Improvements				
11 Cultivated organic mulch planting beds not including irrigation	m ²	91	75.00	6,825.00
15 Rubbish bin LR6220 120L Timber Bin	No	1	2,500.00	2,500.00
16 Picnic table 'TM4340-41 Mernda Setting'	No	2	3,500.00	7,000.00
Landscaping and Improvements				\$16,325.00
XK External Stormwater Drainage				
68 Allowance for stormwater to asphalt pavement including excavation, bedding, pipework, pits and backfill	m ²	691	45.00	31,095.00
69 Allowance for swale to Jarrahdale oval new works	m	65	300.00	19,500.00
70 No allowance for swale to Jarrahdale oval trail head existing car park	Item			Excl.
34 No allowance for stormwater to general pavement types - assumed only asphalt car park	Item			Excl.
External Stormwater Drainage				\$50,595.00

Shire of Serpentine Jarrahdale Trail Development Projects

Order of Cost Estimate

Location Elements Item

C JARRAHDAL TRAIL HEAD (continued)

Rates Current At June 2020

Description	Unit	Qty	Rate	Total
XW External Water Supply				
28 Allowance for water supply to drinking fountain including pipework, trenching, bedding and backfill	m	30	35.00	1,050.00
			External Water Supply	\$1,050.00
PR Preliminaries				
2 Preliminaries and supervision (10%)	Item			21,000.00
			Preliminaries	\$21,000.00
MA Builders Margin				
3 Margin and overheads (10%)	Item			23,000.00
			Builders Margin	\$23,000.00
CT Contingency				
4 Design contingency (5%)	Item			12,500.00
5 Construction contingency (5%)	Item			13,000.00
			Contingency	\$25,500.00
PF Professional Fees				
6 Professional fees (5%)	Item			14,000.00
			Professional Fees	\$14,000.00
ST Statutory Charges				
7 Statutory fees and charges (0.5%)	Item			1,500.00
			Statutory Charges	\$1,500.00
			JARRAHDAL TRAIL HEAD	\$293,392.50

Shire of Serpentine Jarrahdale Trail Development Projects

Order of Cost Estimate

Location Elements Item

D MUNDIJONG TRAIL HEAD

Rates Current At June 2020

Description	Unit	Qty	Rate	Total
EW External Walls				
62 5000mm L x 2000mm H Public art wall, excluding any artist painting including footing	m ²	10	500.00	5,000.00
External Walls				\$5,000.00
FT Fitments				
21 Signage 2000 x 1500 Trail head sign	No	4	1,100.00	4,400.00
22 Signage 900x900 wayfinding / interpretation signs	No	5	650.00	3,250.00
40 Bike station	No	5	950.00	4,750.00
41 BBQ - details TBA	No	1	7,500.00	7,500.00
61 2700mm x 2200mm Horse manure bin	No	1	3,000.00	3,000.00
Fitments				\$22,900.00
SF Sanitary Fixtures				
14 Drinking fountain 'DF5055 TE ARI Drinking Fountain'	No	2	3,500.00	7,000.00
Sanitary Fixtures				\$7,000.00
BW Builders Work in Connection With Specialist Services				
1 Builders work in connection with services	Item			2,500.00
Builders Work in Connection With Specialist Services				\$2,500.00
XP Site Preparation				
29 Allowance to clear existing shrubs and topsoil and dispose on site	m ²	4,461	5.00	22,305.00
Site Preparation				\$22,305.00
XR Roads, Footpaths and Paved Areas				
8 50mm Thick asphalt pavement including boxing out, basecourse etc.	m ²	1,522	85.00	129,370.00
9 Pedestrian Pathway including boxing out, basecourse etc.	m ²	182	115.00	20,930.00
12 200mm Thick compacted crushed rock path including boxing out, basecourse etc.	m ²	1,547	35.00	54,145.00
63 Crushed gravel paving including boxing out, basecourse etc. - Assumed 100mm thick	m ²	749	38.00	28,462.00
13 Line marking to car park	m ²	1,522	2.50	3,805.00
42 Wheel stops	No	19	200.00	3,800.00
45 Line marking for pedestrian crossing	No	1	200.00	200.00
43 No allowance for site kerbing	Item			Excl.
Roads, Footpaths and Paved Areas				\$240,712.00
XN Boundary Walls, Fencing and Gates				
23 Wood post and rail fence	m	78	195.00	15,210.00
64 Steel horse gate	No	2	2,800.00	5,600.00
65 Kissing gate	No	2	2,200.00	4,400.00
Boundary Walls, Fencing and Gates				\$25,210.00

Shire of Serpentine Jarrahdale Trail Development Projects

Order of Cost Estimate

Location Elements Item

D MUNDIJONG TRAIL HEAD (continued)

Rates Current At June 2020

Description	Unit	Qty	Rate	Total
XB Outbuildings and Covered Ways				
17 4000mm x 4000mm Shade shelter 'BS8200 North Shelter'	No	1	15,000.00	15,000.00
37 4000mm x 8000mm Shade shelter 'BS8200 North Shelter'	No	1	22,000.00	22,000.00
Outbuildings and Covered Ways				\$37,000.00
XL Landscaping and Improvements				
11 Cultivated organic mulch planting beds not including irrigation	m ²	465	75.00	34,875.00
15 Rubbish bin LR6220 120L Timber Bin	No	2	2,500.00	5,000.00
16 Picnic table 'TM4340-41 Mernda Setting'	No	5	3,500.00	17,500.00
39 Shade trees 'Marri's corymbia calophylla'	No	4	1,000.00	4,000.00
Landscaping and Improvements				\$61,375.00
XK External Stormwater Drainage				
68 Allowance for stormwater to asphalt pavement including excavation, bedding, pipework, pits and backfill	m ²	1,522	45.00	68,490.00
34 No allowance for stormwater to general pavement types - assumed only asphalt car park	Item			Excl.
External Stormwater Drainage				\$68,490.00
XW External Water Supply				
28 Allowance for water supply to drinking fountain including pipework, trenching, bedding and backfill	m	110	35.00	3,850.00
External Water Supply				\$3,850.00
XG External Gas				
44 Allowance for gas supply to BBQ	m	74	35.00	2,590.00
External Gas				\$2,590.00
PR Preliminaries				
2 Preliminaries and supervision (10%)	Item			50,000.00
Preliminaries				\$50,000.00
MA Builders Margin				
3 Margin and overheads (10%)	Item			55,000.00
Builders Margin				\$55,000.00
CT Contingency				
4 Design contingency (5%)	Item			30,000.00
5 Construction contingency (5%)	Item			31,500.00
Contingency				\$61,500.00
PF Professional Fees				
6 Professional fees (5%)	Item			33,500.00
Professional Fees				\$33,500.00

Shire of Serpentine Jarrahdale Trail Development Projects

Order of Cost Estimate

Location Elements Item

D MUNDIJONG TRAIL HEAD (continued)

Rates Current At June 2020

Description	Unit	Qty	Rate	Total
ST Statutory Charges				
7 Statutory fees and charges (0.5%)	Item			3,500.00
			Statutory Charges	\$3,500.00
			MUNDIJONG TRAIL HEAD	\$702,432.00

Shire of Serpentine Jarrahdale Trail Development Projects

Order of Cost Estimate

Location Elements Item

E RAIL TRAIL

Rates Current At June 2020

Description	Unit	Qty	Rate	Total
FT Fitments				
22 Signage 900x900 wayfinding / interpretation signs	No	22	650.00	14,300.00
48 Shared use path signage	No	11	650.00	7,150.00
49 Informative signage	No	11	650.00	7,150.00
Fitments				\$28,600.00
BW Builders Work in Connection With Specialist Services				
1 Builders work in connection with services	Item			2,500.00
Builders Work in Connection With Specialist Services				\$2,500.00
XR Roads, Footpaths and Paved Areas				
51 5000mm Wide 200mm thick compacted crushed rock connecting to rail trail	m ²	8,610	45.00	387,450.00
56 4000mm Wide 200mm thick compacted crushed rock surface to rail trail alignment	m ²	35,646	45.00	1,604,070.00
67 Standard bridge for pedestrian/bike riders to cross main road. Simple design - assumed 40m long by 2m wide	m ²	80	15,000.00	1,200,000.00
50 Allowance for road crossing safety points	No	7	4,000.00	28,000.00
66 Allowance re-work existing maintenance track to a suitable level including re-grading existing levels and new crushed rock wearing course - as advised by Tredwell Management Services on 18/02/20	m ²	36,900	30.00	1,107,000.00
Roads, Footpaths and Paved Areas				\$4,326,520.00
XB Outbuildings and Covered Ways				
55 Proposed rest area including 4000mm x 4000mm shade shelter, drinking fountain, rubbish bin, picnic table and two bench seats	No	1	26,000.00	26,000.00
Outbuildings and Covered Ways				\$26,000.00
XK External Stormwater Drainage				
34 No allowance for stormwater to general pavement types - assumed only asphalt car park	Item			Excl.
External Stormwater Drainage				Excl.
XX Alterations and Renovations to Existing External Works				
52 Remove rail track only sleepers to remain	m	8,912	50.00	445,600.00
57 Remove existing surface material for connections to rail trail	m ²	8,610	5.00	43,050.00
58 Supply and lay 300mm thick imported fill material to existing contaminated rail ballast including geotec layer	m ²	44,557	40.00	1,782,280.00
59 Allowance to demolish abandon rail bridge including traffic management	Item			100,000.00
Alterations and Renovations to Existing External Works				\$2,370,930.00
PR Preliminaries				
2 Preliminaries and supervision (10%)	Item			675,500.00
Preliminaries				\$675,500.00
MA Builders Margin				
3 Margin and overheads (10%)	Item			743,000.00
Builders Margin				\$743,000.00

Shire of Serpentine Jarrahdale Trail Development Projects

Order of Cost Estimate

Location Elements Item

E RAIL TRAIL (continued)

Rates Current At June 2020

Description	Unit	Qty	Rate	Total
CT Contingency				
4 Design contingency (5%)	Item			408,500.00
5 Construction contingency (5%)	Item			429,000.00
			Contingency	\$837,500.00
PF Professional Fees				
6 Professional fees (5%)	Item			450,500.00
			Professional Fees	\$450,500.00
ST Statutory Charges				
7 Statutory fees and charges (0.5%)	Item			47,500.00
			Statutory Charges	\$47,500.00
			RAIL TRAIL	\$9,508,550.00

Appendix Two

REMPPLAN Reports



Tourism Impact Summary Report for Serpentine-Jarrahdale (S) (Tourism Activity: 365 days)

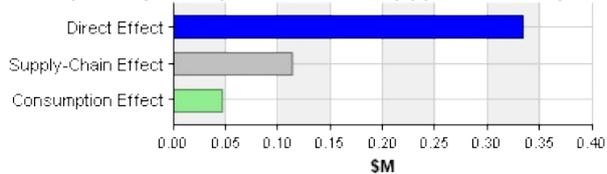
Tourism Impact Scenario

Name Jarrahdale Oval
 Duration 365 days

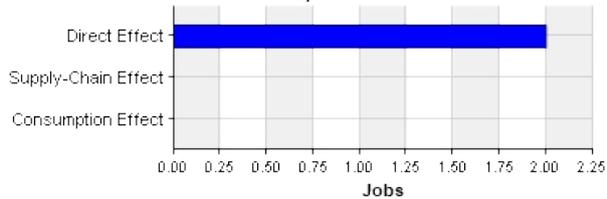
Direct Impact	Domestic Day	Domestic Overnight	International	Total
Number of Visitors	1,295	450	0	1,745
Number of Nights	n/a	2.00	0.00	
Estimated Expenditure per Visitor (\$)	\$97	\$462	\$0	
Total Estimated Expenditure (\$)	\$125,615	\$207,900	\$0	\$333,515

Tourism Impacts

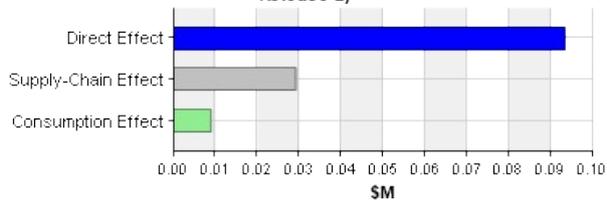
Impact Output - Serpentine-Jarrahdale (S) (2018 Release 2)



Impact Employment Total - Serpentine-Jarrahdale (S) (2018 Release 2)

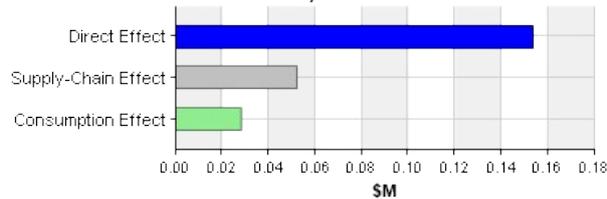


Impact Wages and Salaries Total - Serpentine-Jarrahdale (S) (2018 Release 2)





Impact Value-Added Total - Serpentine-Jarrahdale (S) (2018 Release 2)



Under this scenario Gross Regional Product is estimated to increase by \$0.234 million (0.02%) to \$1,026.162 million. Contributing to this is a direct increase in output of \$0.334 million, 2 additional jobs , \$0.093 million more in wages and salaries and a boost in value-added of \$0.153 million.

From this direct expansion in the economy, flow-on supply-chain effects in terms of local purchases of goods and services are anticipated, and it is estimated that these indirect impacts would result in a further increase to output valued at \$0.113 million, 0 more jobs , \$0.029 million more paid in wages and salaries, and a gain of \$0.052 million in terms of value-added.

These supply-chain effects represent the following Type 1 economic multipliers:

Impact	Type 1 Multipliers
Output	1.340
Employment	1.000
Wages and Salaries	1.312
Value-added	1.340

The increase in direct and indirect output and the corresponding creation of jobs in the economy are expected to result in an increase in the wages and salaries paid to employees. A proportion of these wages and salaries are typically spent on consumption and a proportion of this expenditure is captured in the local economy. The consumption effects under the scenario are expected to further boost output by \$0.046 million, employment by 0 jobs , wages and salaries by \$0.009 million, and value-added by \$0.028 million.

Under this scenario, total output is expected to rise by \$0.493 million. Corresponding to this are anticipated increases in employment of 2 jobs , \$0.131 million wages and salaries, and \$0.234 million in terms of value-added.

The total changes to economic activity represent the following Type 2 economic multipliers:

Impact	Type 2 Multipliers
Output	1.479
Employment	1.000
Wages and Salaries	1.407
Value-added	1.523

Tourism Impact Summary (Tourism Activity: 365 days)

Impact	Direct Effect	Supply-Chain Effect	Consumption Effect	Total Effect	Type 1 Multiplier	Type 2 Multiplier
Output (\$M)	\$0.334	\$0.113	\$0.046	\$0.493	1.340	1.479
Long Term Employment (Jobs)	2	0	0	2	1.000	1.000
Wages and Salaries (\$M)	\$0.093	\$0.029	\$0.009	\$0.131	1.312	1.407
Value-added (\$M)	\$0.153	\$0.052	\$0.028	\$0.234	1.340	1.523



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Tourism Impact Summary Report for Serpentine-Jarrahdale (S) (Tourism Activity: 365 days)

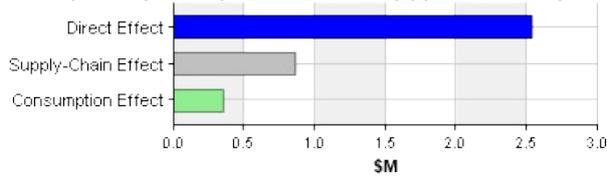
Tourism Impact Scenario

Name Mundijong to Jarrahdale Rail Trail
 Duration 365 days

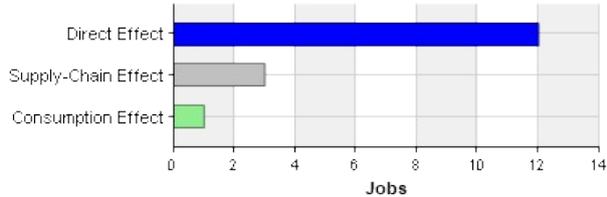
Direct Impact	Domestic Day	Domestic Overnight	International	Total
Number of Visitors	24,700	300	0	25,000
Number of Nights	n/a	2.00	0.00	
Estimated Expenditure per Visitor (\$)	\$97	\$462	\$0	
Total Estimated Expenditure (\$)	\$2,395,900	\$138,600	\$0	\$2,534,500

Tourism Impacts

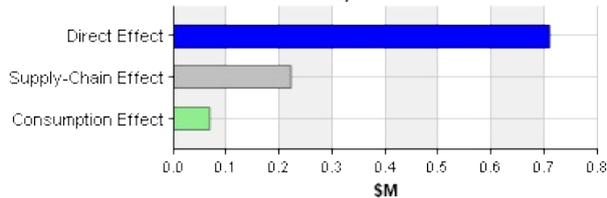
Impact Output - Serpentine-Jarrahdale (S) (2018 Release 2)



Impact Employment Total - Serpentine-Jarrahdale (S) (2018 Release 2)

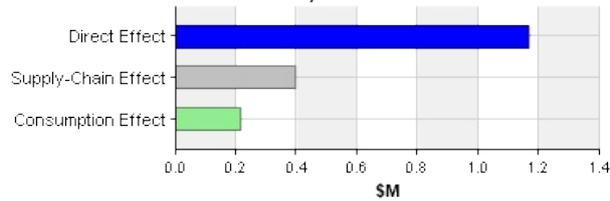


Impact Wages and Salaries Total - Serpentine-Jarrahdale (S) (2018 Release 2)





Impact Value-Added Total - Serpentine-Jarrahdale (S) (2018 Release 2)



Under this scenario Gross Regional Product is estimated to increase by \$1.776 million (0.17%) to \$1,027.705 million. Contributing to this is a direct increase in output of \$2.535 million, 12 additional jobs , \$0.709 million more in wages and salaries and a boost in value-added of \$1.166 million.

From this direct expansion in the economy, flow-on supply-chain effects in terms of local purchases of goods and services are anticipated, and it is estimated that these indirect impacts would result in a further increase to output valued at \$0.861 million, 3 more jobs , \$0.221 million more paid in wages and salaries, and a gain of \$0.396 million in terms of value-added.

These supply-chain effects represent the following Type 1 economic multipliers:

Impact	Type 1 Multipliers
Output	1.340
Employment	1.250
Wages and Salaries	1.312
Value-added	1.340

The increase in direct and indirect output and the corresponding creation of jobs in the economy are expected to result in an increase in the wages and salaries paid to employees. A proportion of these wages and salaries are typically spent on consumption and a proportion of this expenditure is captured in the local economy. The consumption effects under the scenario are expected to further boost output by \$0.353 million, employment by 1 job , wages and salaries by \$0.068 million, and value-added by \$0.214 million.

Under this scenario, total output is expected to rise by \$3.748 million. Corresponding to this are anticipated increases in employment of 16 jobs , \$0.998 million wages and salaries, and \$1.776 million in terms of value-added.

The total changes to economic activity represent the following Type 2 economic multipliers:

Impact	Type 2 Multipliers
Output	1.479
Employment	1.333
Wages and Salaries	1.407
Value-added	1.523

Tourism Impact Summary (Tourism Activity: 365 days)

Impact	Direct Effect	Supply-Chain Effect	Consumption Effect	Total Effect	Type 1 Multiplier	Type 2 Multiplier
Output (\$M)	\$2.535	\$0.861	\$0.353	\$3.748	1.340	1.479
Long Term Employment (Jobs)	12	3	1	16	1.250	1.333
Wages and Salaries (\$M)	\$0.709	\$0.221	\$0.068	\$0.998	1.312	1.407
Value-added (\$M)	\$1.166	\$0.396	\$0.214	\$1.776	1.340	1.523



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Tourism Impact Summary Report for Serpentine-Jarrahdale (S) (Tourism Activity: 365 days)

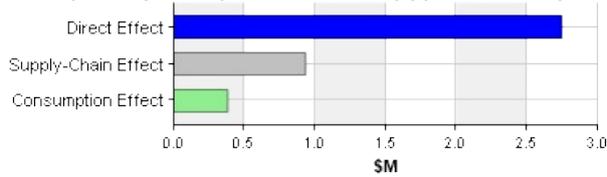
Tourism Impact Scenario

Name Wungong Byford Trail Centre
 Duration 365 days

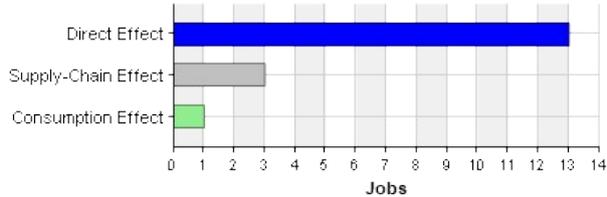
Direct Impact	Domestic Day	Domestic Overnight	International	Total
Number of Visitors	14,000	6,000	0	20,000
Number of Nights	n/a	1.00	0.00	
Estimated Expenditure per Visitor (\$)	\$97	\$231	\$0	
Total Estimated Expenditure (\$)	\$1,358,000	\$1,386,000	\$0	\$2,744,000

Tourism Impacts

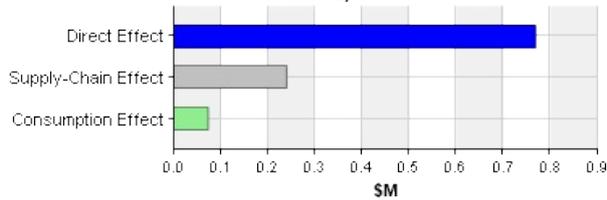
Impact Output - Serpentine-Jarrahdale (S) (2018 Release 2)



Impact Employment Total - Serpentine-Jarrahdale (S) (2018 Release 2)

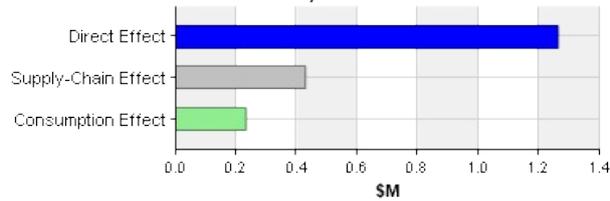


Impact Wages and Salaries Total - Serpentine-Jarrahdale (S) (2018 Release 2)





Impact Value-Added Total - Serpentine-Jarrahdale (S) (2018 Release 2)



Under this scenario Gross Regional Product is estimated to increase by \$1.923 million (0.19%) to \$1,027.852 million. Contributing to this is a direct increase in output of \$2.744 million, 13 additional jobs , \$0.768 million more in wages and salaries and a boost in value-added of \$1.262 million.

From this direct expansion in the economy, flow-on supply-chain effects in terms of local purchases of goods and services are anticipated, and it is estimated that these indirect impacts would result in a further increase to output valued at \$0.932 million, 3 more jobs , \$0.240 million more paid in wages and salaries, and a gain of \$0.429 million in terms of value-added.

These supply-chain effects represent the following Type 1 economic multipliers:

Impact	Type 1 Multipliers
Output	1.340
Employment	1.231
Wages and Salaries	1.312
Value-added	1.340

The increase in direct and indirect output and the corresponding creation of jobs in the economy are expected to result in an increase in the wages and salaries paid to employees. A proportion of these wages and salaries are typically spent on consumption and a proportion of this expenditure is captured in the local economy. The consumption effects under the scenario are expected to further boost output by \$0.382 million, employment by 1 job , wages and salaries by \$0.073 million, and value-added by \$0.232 million.

Under this scenario, total output is expected to rise by \$4.058 million. Corresponding to this are anticipated increases in employment of 17 jobs , \$1.081 million wages and salaries, and \$1.923 million in terms of value-added.

The total changes to economic activity represent the following Type 2 economic multipliers:

Impact	Type 2 Multipliers
Output	1.479
Employment	1.308
Wages and Salaries	1.407
Value-added	1.523

Tourism Impact Summary (Tourism Activity: 365 days)

Impact	Direct Effect	Supply-Chain Effect	Consumption Effect	Total Effect	Type 1 Multiplier	Type 2 Multiplier
Output (\$M)	\$2.744	\$0.932	\$0.382	\$4.058	1.340	1.479
Long Term Employment (Jobs)	13	3	1	17	1.231	1.308
Wages and Salaries (\$M)	\$0.768	\$0.240	\$0.073	\$1.081	1.312	1.407
Value-added (\$M)	\$1.262	\$0.429	\$0.232	\$1.923	1.340	1.523



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