



# Designing and operating our network of trails

A world-class network, comprising 44 trails over 186km of stunning landscape, is proposed to attract mountain bikers locally and internationally to Warburton.

Innovative design and construction techniques would be used to integrate the network into the natural environment, while creating an enjoyable and challenging experience for riders of all skill levels.

Delivering a world-class mountain bike destination in the heart of the Yarra Ranges would facilitate tourism, economic and jobs growth and provide a positive community connection with the biodiversity and heritage values in the region.

Protecting the area's significant natural and cultural environment and minimising potential impacts has been central to the project's development from day one.

Yarra Ranges Council is preparing an Environment Effects Statement which will include detailed investigations, further development of strategies to manage environmental risks and assessment of the project's potential impacts.

Specialist builder **World Trail** was appointed in 2019 to finalise the network design and build the trails.

World Trail has built more than 700km of purpose-built Australian recreational trails including Blue Derby (Tasmania), Atherton and Smithfield (far north Queensland) and both Falls Creek and Mt Buller in Victoria.

Director Glenn Jacobs said his company had designed, planned and constructed hundreds of projects in 20 countries.

"We've been involved (in the project) since back in 2013 ... and I can tell you there's nothing like it here in Australia," he said.

"The natural features here are really spectacular, it's really amazing.

"Imagine finishing a ride in the mountains around Warburton and finishing it right on the Yarra River, with platypus and amazing scenery."

## Fast facts



186.6km, 44 trails



Four main trail heads



2 large bridges



22 small bridges



47 sections of boardwalk



66% cross country and 34% gravity trails

Warburton Mountain Bike Destination

A WORLD-CLASS MOUNTAIN BIKE DESTINATION IN THE HEART OF THE YARRA RANGES

[rideyarraranges.com.au](http://rideyarraranges.com.au)





## DESIGN PRINCIPLES

A number of design principles have been identified through consultation for consideration during project design and development, including:

- Provide a range of trails, suitable for riders of all abilities, and first-class facilities
- Put Warburton at the heart of the network, providing ride in, ride out experience
- Prioritising superior rider experience
- Minimise construction footprint – including off-site prefabrication when possible
- Protect natural environment during works
- Avoid or minimise disrupting native animal habitat – including Leadbeater's possum and the Mount Donna Buang Wingless Stonefly
- Design and construct the trails to avoid removing large trees
- Remove as little natural vegetation
- Maintain heritage values within project area
- Minimal signposting
- Avoid excessively flat or steep areas
- Minimise impact on cool temperate rainforest
- Minimise impact on waterways
- Manage water run-off and erosion for long-term sustainability
- Integrate network into natural terrain where possible
- Rehabilitate and incorporate existing informal trails into network
- Avoid building trails near homes
- Upgrade roads to cater for increased traffic
- Achieve IMBA gold ride status (networks above 160km)



## Sensitive design to look after the environment

Minimising impacts and ensuring long-term sustainability are central to designing and implementing a successful mountain bike trail network.

This begins in the design phase - by ensuring trails avoid critical environmental values and sites of cultural heritage significance - and continues in the construction phase through careful and sensible design refinements and construction practices.

Extensive research has been carried out by environmental and other technical specialists at every stage of the project's development.

Designing mountain bike trails includes multiple stages - conceptual design, master planning, detailed design and pre-construction assessments.

It requires continual refinement and adjustment, reflecting the ever-changing natural environment and an evolving knowledge of the landscape.

This adaptive approach means the design process is not always iterative.

Trail design is always informed by rigorous expert advice including through the construction phase.

## Stages of design



### Conceptual design

Trails are mapped and planned based on research of ground conditions and knowledge of access points, with a focus on sustainability, rider experience and difficulty.

### Master plan

Each conceptual trail alignment is investigated in person, the trail alignment is walked and mapped by trail planners and relevant biodiversity and heritage experts. The concept design is updated in response to on-ground conditions.

### EES assessment

The proposed design and any potential impacts will be assessed through the EES process including feedback from communities and stakeholders. The EES process may inform changes to the design.

### Detailed design

The detailed design is developed following the EES assessments and outcome, and includes refining construction methodology, infrastructure designs, trail alignment and appropriate responses to on-ground conditions.

### Micro-siting

A detailed pre-construction walk-through with the trail builder and technical experts to inspect conditions confirm exact alignment, identify any environmental values to be protected and agree on construction methods.

## Making changes to our designs

Numerous design changes have been made in response to on-ground conditions which differed from desktop assessments.

We've sought to avoid or minimise the impact on sensitive values as part of the design development.

### Drop A-K trail

Despite significant revisions, the current Drop-A-K trail would pass through a 2.42km area of cool temperate rainforest, close to the summit of Mt Donna Buang.

The trail was moved slightly to avoid more rainforest but is constricted due to requirements not to encroach into a crucial water catchment area.

Measures were also taken to avoid a Mt Donna Buang Wingless Stonefly habitat and Leadbeater's Possum nesting and monitoring locations close to this trail.

### Residential proximity

The network was modified around Old Warburton Road and Merlino Avenue in response to community concerns about proximity to homes.

Other revisions include realigning trails to avoid unnecessary water crossings, cutting the number of sharp switchback turns and identifying existing informal trails to be merged into the new network.

### Crossing waterways

A "no wet wheels" approach, using elevated structures to cross all waterways, has been adopted to protect waterways and minimise erosion.

Elevated structures would be used in boggy areas, including boardwalks and low-level bridges, also creating enjoyable conditions for riders.

Bridges over the Yarra River and Old Warburton Road would be used to provide a safe crossing, connect trails and minimise traffic conflicts.

Existing clearings would be used at both bridges to avoid clearing vegetation and pre-fabrication of components would occur off-site.

No works are proposed within the Yarra River. A new bridge is proposed to be build over the Yarra River, and works will be planned to avoid or minimise impacts on the waterway.



# Building a world-class network of trails

We'll use a variety of innovative construction methods to minimise impacts on the surrounding natural environment.

Environmental investigations through the EES will help to refine the design of the trails and buffer zones would be used to protect important areas from construction activities.

## Trail types

- **Standard excavation trail:** Commonly used technique involves cutting a path into the existing slope. Cut and fill techniques are used to create a smooth soil path.
- **Elevated structures:** Built-up decking used to avoid and minimise impacts to waterways and associated biodiversity values or over soft ground.
- **Rock armoured surfaces:** Generally used on steep gradients, where the soil would otherwise likely be displaced by water or trail users, leading to erosion. Also used when crossing wet areas.
- **Raised embankments:** May be necessary for wet and boggy trail sections where tree roots run along the surface, or to improve rideability through changing the vertical alignment. Excess material is moved along the trail to where it's required.

Rock walls may be used for stabilisation and retaining walls would only be used where they cannot be avoided through realigning the trail.

The mountain bike trails will generally be between 600mm and 900mm wide and naturally surfaced.

Considerable effort is made to avoid flora and fauna of environmental significance during construction, as evidenced by the differing trail designs.



## OUT SLOPE

All trails should be out sloped, where possible.

This means it slopes gently down towards the trail's lower outside edge. This allows water flowing down the hillside to run off the side of the trail.

## ROLLING CONTOURS CONCEPT

This concept states the trail should be built in side-slope location, aligned with the contours of the hillside, generally with undulating gradients.

## TRAIL GRADIENT

There are two key guidelines that are followed when building mountain bike-specific trails:

- The half rule: Trail gradient shouldn't exceed half of the grade of the hillside or slope it passes along. If it does exceed half, it is then considered a fall-line trail. Water will then run along the trail, moving soil and causing erosion.
- A gradient less than 10 per cent is the most sustainable option.

## GRADE REVERSALS

Dips and crests incorporated into a trail create exciting features for riders and are known as grade reversals. The term refers to the point where a trail changes from downhill to uphill.

## Trail difficulty rating system

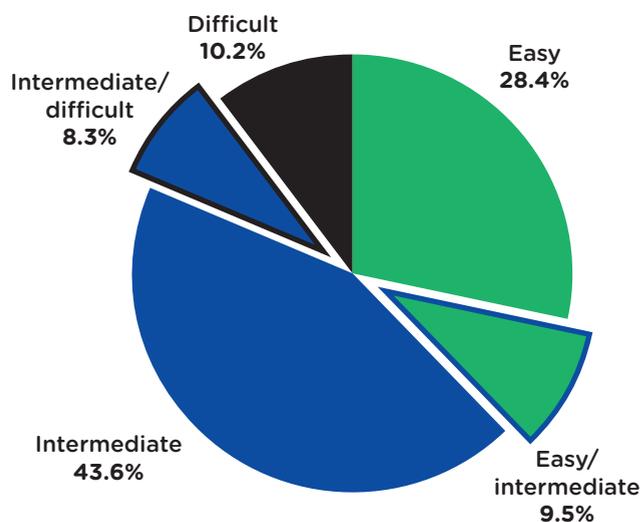
The network has been designed to cater for riders of all abilities.

The mix of trails has been informed by extensive market research and expert advice.

A grading system, determined by technical difficulty, allows riders to make informed choices, allowing safe and enjoyable riding with an appropriate level of safety.

Hand-installed trail signage will be minimal, showing arrows, trail identification numbers and other important information.

### PROPOSED TRAIL DIFFICULTY RATING



The Mountain Bike Australia trail difficulty rating system differentiates each trail by its:

- Width
- Surface
- Grading
- Exposure
- Sign quality
- Natural and technical trail features



### TRAIL DIFFICULTY RATING SYSTEM

SYMBOL	SHORT DESCRIPTION
	<p><b>Very Easy</b></p> <ul style="list-style-type: none"> <li>• Wide trail with a gentle gradient, smooth surface and no obstacles</li> <li>• Suitable for beginner cyclists with basic bike skills, and most bikes</li> </ul>
	<p><b>Easy</b></p> <ul style="list-style-type: none"> <li>• Wide trail with a gentle gradient and smooth surface</li> <li>• Some obstacles such as roots, logs and rocks</li> <li>• Suitable for beginner cyclists with basic mountain bike skills, and off-road bikes</li> </ul>
	<p><b>Easy with Intermediate Sections</b></p> <ul style="list-style-type: none"> <li>• Likely to be a single track with a moderate gradient, variable surface and some obstacles</li> <li>• Some obstacles such as roots, logs and rocks</li> <li>• Suitable for mountain bikers with mountain bikes</li> </ul>
	<p><b>Intermediate</b></p> <ul style="list-style-type: none"> <li>• Single trail with moderate gradients, variable surface and obstacles</li> <li>• May include steep sections</li> <li>• Suitable for skilled mountain bikers with mountain bikes</li> </ul>
	<p><b>Intermediate with Difficult Sections</b></p> <ul style="list-style-type: none"> <li>• Suitable for competent mountain bikers, used to physically demanding routes</li> <li>• Expect large and unavoidable obstacles and features</li> <li>• Challenging and variable with some steep climbs or descents and loose surfaces</li> </ul>
	<p><b>Difficult</b></p> <ul style="list-style-type: none"> <li>• Suitable for experience mountain bikers, used to physically demanding routes</li> <li>• Navigation and personal survival skills are highly desirable</li> <li>• Expect large, dangerous and unavoidable obstacles and features</li> <li>• Challenging and variable with long steep climbs or descents and loose surfaces</li> <li>• Some sections will be easier to walk</li> </ul>
	<p><b>Extreme</b></p> <ul style="list-style-type: none"> <li>• Suitable for highly experienced mountain bikers, used to physically demanding routes</li> <li>• Navigation and personal survival skills are highly desirable</li> <li>• Severe constructed trails and/ or natural features, all sections are challenging</li> <li>• Includes extreme levels of exposure and/ or risk</li> <li>• Expect large and unavoidable obstacles and features</li> <li>• Some sections will be easier to walk</li> </ul>



## Maintenance

Regular inspections would identify any problems or trail changes that need to be rectified. This will ensure the network provides a superior riding experience during all seasons. This work is expected to be carried out by up to four full-time staff members.

Proactive maintenance will include:

- Pruning
- Weed control
- Trail edge mowing/cutting
- Trail sweeping
- Drainage works
- Litter removal

Regular patrols would be conducted to identify, close down and rehabilitate any illegal trails created.

## Operation

The network will operate from sunrise to sunset, allowing flexibility for riders to plan their journeys.

We know state-of-the-art facilities are just as important as the network itself.

We're proposing to build a visitor's hub – allowing direct access to the northern and southern trails - and main trail head to the south of Warburton Golf Course.

This would feature an upgraded carpark, shuttle bus shelter, toilet and shower facilities, picnic tables, comprehensive visitor information and wash bays.

A new trail head would also be built at the top of Mount Tugwell, while existing visitor facilities at Mount Donna Buang and Wesburn Park will be integrated into the network and upgraded.

A shuttle bus would transport riders between trail heads at regular intervals.

We expect the network to become a drawcard for both local, state and national mountain bike events.

### WHAT WE'VE LEARNED FROM OTHER DESTINATIONS

- Inspired by European ski resorts, our network radiates from the centre of Warburton to provide a “ride in, ride out” experience.
- An immersive experience with trails embedded in the landscape, connecting riders with the natural environment.
- Trails start and end within a significant town with access to a variety of services and amenities.
- A variety of trail difficulties to attract riders of varying skill levels from beginner to advanced levels.



Bright Mountain Bike Park, Victoria

## Find out more and stay involved

**Community input is an important part of the EES process and the project's continued development.**

🌐 Sign up for project updates, find the latest information or ask a question on our website [rideyarraranges.com.au](http://rideyarraranges.com.au)

✉ [mtb.planning@yarraranges.vic.gov.au](mailto:mtb.planning@yarraranges.vic.gov.au)

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NOVEMBER 2020

