







### 5.1 TRAIL DEVELOPMENT PROCESS



The trail development process is the planning, design and construction procedures required to ensure the long-term sustainability of a trail facility.

To ensure successful trail development the required stages are outlined in the graphic below.





This 8 stage process, briefly outlined in the table below, is deliberately prescriptive in order to ensure the delivery of the highest possible standard of trails which are sustainable and an asset to trail owners and the community.

Stage	Outcome		
1 Trail Proposal	The proposed area is supported in principle, or not supported due to constraints precluding trail development.		
2 Framework	A project outline including a clear understanding of project objectives, stakeholders, roles, requirements and execution		Des
3 Site Assessment	Undertake a broad scale study of the area and identify constraints		Desktop
4 Concept Plan	Conceptual design plan produced		
5 Corridor Evaluation	Concept plan checked and flagged in the field	Fie	
6 Detailed Design	Detailed trail design produced including classifications, technical trail features, construction types and specifications, and gain approvals.	Field	
7 Construction	Trail is constructed following the design specifications		
8 Management	Management plan implemented detailing maintenance and monitoring requirements		



# The definitions of these eight stages are provided below.

Trail Proposal	At the beginning of trail project the viability of the proposal should be assessed through preliminary background investigations of community support, legislative requirements, existing and proposed land use and management considerations.  An Impact Evaluation Checklist (IEC) can be completed (desktop) to check for major constraints such as management plans, existing master plans, disease risk areas, water catchment.
Framework	Development of a clear framework guides and informs the entire project.
Site Assessment	The site assessment, combined with the framework inform the development of the concept plan.  Conduct on ground, desktop and literature review of:  Location, Access, Land Use, Landscape, Ground Conditions,  Existing Recreation Use, Heritage and Environmental Protections and Constraints, Conflicts and Sensitivities.  It is advised to meet with stakeholders to garner support and mitigate concerns at this stage.
Concept Plan	The concept plan illustrates what the trail system may look like and addresses key strategic priorities such as:  Detailed review and identification of;  Location of trailhead, configuration of trails, alignment of trail corridors and estimation of development costs.  It also identifies construction stages and makes broad cost estimates.  The concept plan can form a crucial consultation tool to be presented to stakeholders.
Corridor Evaluation	The Corridor Evaluations stage completes the IEC by undertaking detailed checks and surveys within the proposed corridor identified in the Concept Plan and documenting environmental or heritage protection strategies where required.  The corridor evaluations help to formally establish and agree on the location of trail corridors with land owners/managers and other stakeholder and should be developed into a report which can be used to seek approvals to proceed with detailed design.  It may require work with specialist consultants to undertake; Dieback Mapping, Flora Survey and Aboriginal Heritage Survey, establishing estimated design, construction and management costs, identifying appropriate ways in which trails can be developed.  Once the constraints have been assessed and any mitigation strategies documented, the proposed trail corridor can be flagged in the field.



6 Detailed Design	Review corridor evaluation outcomes, adjust trail corridor alignments and undertake detailed trail design including; trailhead nature and design, additional major feature designs, definitive trail lines and trail feature types and locations.  The draft design plan should include construction ready specifications, final detailed design plan drawings related to these and timescales for approval by the Steering Group.  Detailed design should include:  Definitive trail lines, flagged in the field and identified on the plan, including the location of:  • Turns • Technical Trail Features • Built structures • Drainage features • Hardened surfacing  Schematic construction plans including specified drawings for: • Turns • Technical Trail Features • Built structures • Drainage features • Trail tread construction cross sections • Hardened surfacing  Details of resources and materials required A signage plan Estimated probable construction costs
7 Construction	<ul> <li>Develop detailed construction and tender specification including; prescriptive trail plan and drawings, chainage identifying trail construction type and feature location, documentation of typical trail features and drainage techniques, construction management plan and standards.</li> <li>secure final approvals and permits</li> <li>Advertise tender, select supplier</li> <li>Appoint trail builder</li> <li>Administer contract</li> <li>Develop 'as built' documentation required for ongoing assessment and management of the facility.</li> </ul>
8 Management	Trails, like any other facility, require ongoing management and maintenance. A management plan should encompass all aspects of managing the trail and should be developed and agreed on by the Steering Group. The management plan should be informed by the Framework, and any broader land management policies. The plan should include:  • Background information (Outlined in the Framework)  • The trail system • The classification of the trails  • Target use • The amount and type of use  • Clarification of management roles and responsibilities (outlined in the Framework)  • Trail adoption and volunteer roles  • Funding and resources  • A record of the infrastructure and costs or link to the appropriate system or asset database  • Maintenance program  • Audit • Frequency  • Standards (e.g. construction, hygiene, signage)  • Works program • Funding and resources  • Hazard inspection and reporting procedures  • Visitor statistic recording procedures  • Marketing

# 5.2 GUIDING PRINCIPLES FOR TRAIL DEVELOPMENT AND CONSTRUCTION



In order to assist the City of Albany to create an environment that fully supports the development of Albany into a Trails Tourism Hub the following principles have been suggested. These general design and location considerations should be taken into account before and during construction of any trail.



### **GUIDING PRINCIPLES FOR TRAILS TOURIST HUBS**

- ✓ Locate new trails in iconic locations, within the City Centre and expanding outwards
- ✓ Focus on new trails growth markets (Mountain Bike and Aquatic)
- ✓ Give priority to trails that provide loops and connectivity
- ✓ Development of trail activity nodes which capitalise on iconic coastal landscapes

### GUIDING PRINCIPLES FOR SUSTAINABLE TRAIL CONSTRUCTION

#### **Trails Location and Corridor Evaluation**

**Trail Network:** The trail network and trailhead should be located such that riders finish their ride with a descent back to the trailhead. Most riders tend to prefer to do any hard climbing early during their ride, finishing with a descent.

A mountain biking trail system should be easy to navigate and intuitive, with the majority of trails offered as loops, and generally following the same overall direction of travel. It should ideally be possible to ride one lap of the entire trail network, without backtracking, without crossing over any trails and without missing any large sections of trail.

For a trail network, especially mountain biking, the easiest trails should be located near the trailhead, with increasingly harder trails located further from the trailhead. This is a risk management technique to prevent inexperienced riders accidentally ending up on very difficult trails.

A trail network should be sympathetic to the terrain and topography, without trying to squeeze a large network of trails into a small space.

Follow existing tracks/trails where possible to minimise disturbance to the landscape Avoid areas of dense vegetation that may require heavy clearing, avoid environmentally sensitive areas (e.g. areas of endangered flora) and areas with high erosion potential Trails should meander to take advantage of natural and man-made features and to create

Trails should meander to take advantage of natural and man-made features and to create interest. Avoid long straight sections with long steady grades.

Use aerial photography, supported by extensive on-the-ground verification, to enable the best possible routes of proposed trails to be selected that maximises use of already-disturbed locations and that minimises the need for clearing of vegetation.



**Drainage planning:** Proper drainage is of considerable importance in constructing a lasting, maintenance-free facility. Water should be removed from trail surfaces as fast as possible, wherever possible. The steepness of some trails and the type of soil dictate individual site requirements for the frequency of draining water from trails. Culverts and other drainage controls (steps and water bars) should be used to direct run-off away where needed. It should be noted that some slope is desirable on shared-use trails.

### **Trails Design and Construction**

**Trail Direction:** Trail direction should be a consideration, especially for mountain biking trails where riders ride at speed. Single-direction trails are recommended for mountain biking trails in a network to improve visitor experience and safety.

**Trail Width:** Walk trails in the locations proposed should have a maximum trail width of 1.5m where purpose-built trail is required. On suitable sections a more intimate experience can be provided by reducing the trail width to around 1.0 - 1.2m. Shared-use trails should have a minimum trail width of 2.5m. Consistency of width is particularly important for mountain bike trails.

**Trail Height:** On trails only to be used only for walking (where cycling and mountain biking are to be excluded) height clearance should be around 2.5m.

**Trail Surface materials:** Walk trails can range from smooth natural earth surfaces to rushed limestone or more hardened surfaces, depending on the grade and purpose of the trail. A smooth compacted surface is most appropriate for shared-use trails and mountain bike trails. The surface should be firm enough to provide cyclists with a relatively smooth ride, and free of potholes and undulations. Choose appropriate materials for the trail's sub-base and topping (surface layer) to ensure longevity and suitability of the trail for the intended user groups. Use debris from trail clearing to prevent use of unwanted paths

**Drainage:** Ensuring local drainage is maintained along natural watercourses where possible. Ensure local drainage is maintained along natural watercourses where possible.

**Signage:** Effective signage will reduce possible conflicts between different types of trail users — for example, walkers and trail bikes or 4WD's, or cyclists and walkers. A code of conduct and field heirarchy will also reduce conflict between different trail users

Rating: All trails should be given a trail difficulty rating



**Road Crossings:** A crossing should have enough space cleared and levelled on both sides of the road to allow trail users travelling together to gather in a group and cross en masse, to reduce overall time spent at the crossing. The crossing should be at a straight, level area allowing both trail user and vehicle driver good visibility and the driver ample stopping distance. The trail should be clearly marked on each side of the road for easy recognition and the crossing be designed to move the trail user away from the road reserve as quickly as possible. If at all possible the trail should not slope down – or up – to the road. Further information is provided in *Austroads Guide to Traffic Engineering Practice – Pt 14 – Bicycles.* 



### **Horse Trail Design**

The following was extracted from *Horse SA's Horse Trail Infrastructure – Guidelines for Peri Urban Precincts (2010)* by Tredwell Management and provides some highly valuable guidance with regards to horse trail design:

Barriers/control points: controlling access onto a trail, modifying speed or direction of users, often providing a barrier to unauthorised vehicular access. Suitable barriers may include the use of bollards, posts or rocks. Barriers should not require a horse to step over an obstacle exceeding 35cm in height and should have no protruding sharp edges. A cavaletti (step-over) allows safe access for horse and rider and should preferably be 3m wide, with a step-over height of 30 – 35cm.

Control points should provide a hardened, horse-friendly surface.

- **Bridges:** the single most expensive item to include on a trail and may need to service recreational trail users and other users, such as emergency service vehicles. Careful consideration of construction materials is required, avoiding noisy materials and providing anti-slip surfacing. The colour and consistency of the surface of the trail should continue from the trail tread approaching the bridge, and over the bridge itself. Preferred widths are greater than 3.5m wide, with parapets.
- Boardwalks: a series of interconnected bridges positioned above ground height, enabling users to navigate over areas of sand, marshes or wetland. Horse trails rarely have boardwalks.
- **Hitching posts, Rails and Rings:** most likely to be required at trail heads, watering points and rest stops, including horse float parking sites. A hitching ring is a heavy duty ring anchored firmly into another solid fixture, such as a wall. A hitching post is a single upright post, strong enough to at least withstand a 750kg horse pulling back. A hitching rail accommodates 2 4 horses and should be placed at least 6m away from any other trail infrastructure, including the trail itself, installed on a hardened surface.





- **Mounting blocks:** installed at trail heads, rest stops and gates where horse riders are required to dismount to open and close. Riders normally mount the horse on the left hand side (head facing forward) and require a clear area around the mounting block. Wheelchair accessible mounting ramps might be considered at trail heads.
  - One, two, or three step designs might be considered, dependent on budget, sitting and materials selected. Individual step heights approx. 250mm, width greater than 500mm and depth greater than 250mm.
- Watering Points: Trail heads require an identified source for stock water. Troughs require regular inspection (preferably daily) cleaning and maintenance. Taps fitted with self-turning-off handles can be supplied by mains water. If access to mains water is not available it may be necessary to provide rainwater tanks that collect runoff from shelters or other structures and may form part of other bridle trail infrastructure, such as covered seating and interpretive facilities at trail heads and rest stops. Such facilities would require on-going maintenance to ensure reliable water supply and that the supply meets all relevant health regulations. Maintenance would most likely be undertaken by the relevant land manager.
- Traffic Separation: riding along roadsides should be avoided as far as possible. Horses under the control of a rider are permitted to travel either way on the verge or footpath with due care. Where unavoidable, the provision of a natural or artificial barrier between the horse rider and vehicles on the carriageway should be considered. Provision of sufficient space between carriageway and trail would be considered a natural barrier, as would vegetation and earth mounding. Loss of roadside verges (at bridges or on the crest of hills and bends) creates 'crush points', which need to be carefully considered in terms of trail user safety.
- Road Crossings: crossing points should be minimised as far as possible, and safety
  for all trail users can be improved by careful selection of crossing points. If room permits,
  the installation of a horse holding bay is preferable, creating an area where horses can be
  held at holt, prior to crossing a road. A Pegasus crossing could be installed where regular
  crossings over busy roads are anticipated.
- **Crossing points:** need to be well signed, with holding bays/bump rails (approx.1.4m high) located on a firm, natural surface. Crossing points require maximum sightlines for oncoming traffic and need to be free of hazards (street furniture, poorly placed signage, obtrusive landscaping).
- **Signage:** signage requirements vary from trail to trail and specific requirements may be imposed by various land managers (signage plans/policies). Signage hierarchy:
  - Primary signage Trail Heads



- Secondary signage wayfinding markers
- Tertiary signage location specific (e.g. 'Close the Gate')
- Regulatory signage (e.g. road signs)

Each land manager will have policies, specifications, application requirements and approval processes that must be complied with. All stakeholders (land managers, funding agencies, community groups) should review and approve all information contained on all signage.

- Horse yards: yards often hold horses for overnight stays and need to be well
  constructed.
- **Trail Heads:** provide an entry point onto a trail network, and include signage (with key trail information), horse float parking, tie up rails, horse yards (potentially), stock water source, rider and other trail user facilities. Perimeter fencing with gates is preferred to provide an extra level of security. Key considerations include trail head entry and exit points, vehicle turning circles, sightlines, and provision of sufficient parking numbers (including horse float parking). Consideration is also required for power availability, water (stock and human consumption), facilities for camping and BBQ areas and any resultant implications for neighbouring land uses/properties and conservation/heritage areas.

### • Trail Dimensions:

- The trail ceiling (trail surface to lowest overhead obstruction) should be 3m.
- The trail tread width should be minimum 500mm (single horse track/bridle trail).
- The trail corridor width should be minimum 1m (obstacle free, assuming trail tread is located centrally within the corridor).
- **Trail Surface:** A natural trail surface is preferred and long sections of asphalt or concrete avoided. Unstable, loose surfaces and loose debris (stones larger than 10mm across) are not suitable. The trail surface should be maintained in a safe condition, with the removal of any sharp objects (glass, metal scraps, loose wire), with the timely repair of deep pot holes/bog holes. Steep slippery surfaces such as rocky outcrops can be dangerous, although the degree to which certain surfaces/obstacles are acceptable is dependent on the experience and technical ability of the rider and the level challenge intended for the specific bridle trail.
- For multi-use trails: the use of trotting fines as surfacing options offers a relatively cost effective option to other surfaces, whilst serving to reduce impacts such as erosion of the trail tread. Trotting fines are a natural by-product of a variety of mining operations, comprised of 2mm diameter crushed aggregate (also known as crusher dust). This type of material is readily available from quarries.



# 5.3 FRAMEWORK TEMPLATE



# City of Albany PROPOSED FRAMEWORK FOR TRAIL DEVELOPMENT

Project Name	
Project Location	
Project Area	plan attached
Tenure	
Background	
Steering Group	
Objectives	
Meetings	
Management Model	
Scope and Scale	
User Types and Styles	
Trail System/Model	
Agreed Standards	
Funding	
Delivery	
Evaluation	
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(Based on work by D. Davis, 2010)



### 5.4 TRAIL DEVELOPMENT FRAMEWORK



### **EXPLANATORY NOTES**

The development of a framework for proposed trail developments will ensure clarity with all stakeholders working towards agreed objectives and outcomes, along with assisting and informing the trail planning, design, construction and management stages. The following notes have been provided as a general guide to the development of the framework.

### **TYPES OF TRAIL SIGNAGE**

Location	Provide a description of the proposed location
Project Area	Provide details of the boundaries of the planning area for the proposed trails.
Tenure	Provide details as to the land tenure, or mix of land tenures applicable to the project area
Background	Provide the background as how the project area has been identified and why it is being considered for trail development.
Steering Group	Developing a framework can only be done through clear and formal consultation with all relevant stakeholders and partners. It is crucial that all key stakeholders and partners are identified, understand and support the planning, design and delivery process.  Provide a list the key agencies/groups and persons who will form the steering group. Include contact details – phone and email as minimum.
Meetings	Identify an indicative timeframe of how often and where the Steering Group will meet for the duration of the project.
Objectives	Project objectives should define the overall aim and outcomes of the project, clearly setting out what the project is trying to achieve and why. Objectives may include environmental, economic, social or community outcomes. All objectives should be high-level and SMART – Specific, Measurable, Achievable, Realistic and Timely. Project objectives should not detail 'how' the outcomes of the project will be achieved.
Management Model	To ensure long-term sustainability, it is essential to identify who is the trail owner and operator.  (The trail owner is the entity that owns the physical structure of the trail and manager of the land and carries the liability for the health and safety of all users. The operator is generally the entity that maintains the trail to the agreed standards of the owner.)  • Who is the trail owner?  • Who is the trail operator?  • How will visitor use be monitored?  • Who will undertake the maintenance – owner, operator, volunteers?



# Scope and Scale

The scope and scale clearly identify the significance and size of the project and are closely linked to achieving the project objectives.

- What is the proposed trail/networks level of significance national, regional or local?
- What are the parameters of the project? What size/extent is the project? How many kilometres of trail is planned?
- Is the project development to be staged?
- What type of use is proposed recreational and/or event?

# User Types and Styles

It is essential to define the target users of the trails as part of the framework to ensure that they meet the needs and expectations of the intended users.

- What are the different types of users being targeted?
- · What are the abilities of target users?
- What are the appropriate trail classifications for the targeted users?
- What are the different styles of activities that will take place on the trails (if appropriate) e.g. cross country vs downhill for mountain bike trails?
- Is the trail single use or multi use?

### Trail System/ Model

The trail system defines the design, layout and configuration of the trails as well as the location, nature and extent of associated facilities and infrastructure such as car parking, toilets and trailheads.

Outline the trail system being proposed.

- Is it linear or looped trail?
- Is it a single trail or a network of trails?
- If looped, is it a core trail, stacked loop, cloverleaf, or finger style?
- Is it single or dual direction?

The trail model will be or become a part of, for example a trail hub, centre, network or individual trails. The trail model must be appropriate to the location, scope and scale of the project and clearly link back to the project goals.

### Agreed Standards

These standards must be agreed by the Steering Group and applied consistently to all aspects of –

- Design, e.g. IMBA guidelines or designing trails to the agreed classification.
- Planning, e.g. following correct approval procedures; undertaking an Impact Evaluation Checklist; undertaking consultation throughout the development process.
- Construction, e.g. building standards; hygiene protocols; ensuring trail fits into the environment; ensuring appropriate supervision.
- Maintenance, e.g. checklists and frequency, construction standards, maintaining trail to its original state (no new features).

### Funding

Outline how the project will be funded. For larger projects with multiple funding sources, it may be beneficial to outline the sources for the specific stages of trail development e.g. Site Assessments, Concept Plan, Corridor Evaluations, Design, Construction and Management, possibly in a table format.

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### Delivery

Confirming the way the project will be delivered requires the Steering Group to agree on the following key issues:

- Who will deliver the project? (staff, contractors, volunteer, and for what sections of the trail development – Site Assessments, Concept Plan, Corridor Evaluations, Design, Construction and Management?)
- How will the project be delivered?
- Who will manage the project?
- How will the project be managed?
- Who will take responsibility for delivering different aspects of the project?
- Will the project be staged?
- What are the proposed timelines?

#### Evaluation

Evaluation of the project is essential to find out if the project has met its objectives and to improve future trail developments. A methodology should be described for evaluation in the framework including:

Evaluation criteria

- Has the project met its planned objectives?
- Are the trails being used by the intended target market?
- Has predicted usage been reached? Are users satisfied?
- Are then any unforeseen issues/impacts (environmental, economic or social)?

Evaluation data: arrangements for data collection.

When will evaluation take place?

Who will evaluate? Roles and responsibilities.

### Stakeholder Approval

Document the Steering Group approval of completed and agreed framework.



### 5.5 SIGNAGE GUIDELINES



For the purposes of Albany's Trail Hub, there are five forms of Trail signage:

- 1. Trail Head
- 2. Waymarking
- 3. Directional
- 4. Interpretive
- 5. Management

### 1 Trail head

As described elsewhere in this report the trail head is the area where users can access the trail. This area is accessible by road and usually provides parking and some amenities for trail users (toilets, information, and rules). Trail head signage features the following information:

- Trail name
- Trail type (i.e. walk, mountain bike, equestrian)
- Trail length and difficulty information (including classification system and personal safety, Estimated completion time;)
- Environmental or management information, such as code of conduct
- Orientation and Navigation (this information is particularly relevant where a trail head is at the beginning of a trail network, where the user needs to make decisions regarding which path to take) including Graphic image/map for orientation.
- Land manager contact information

Where a trailhead is marking a trail network the trailhead signage should include a Map of the trail system. The map should clearly show how trails link up. For example where a single track trail uses a section of fire road or vehicle track this should be marked as a continuous trail. Maps should always be orientated north and include a legend and scale.

### Waymarking

Waymarking is signage on the trail which directs trail users. A familiar waymarking example is the Bibbulmun 'wagyl'. The extent of waymarking signage will depend on the target market and trail grade – the harder the trail, the less the need for trail markers, but the more important it is to have clear information at the trail-head (warning of trail conditions, length, duration, etc). Waymarking signs should be attached to posts at the start of trails, at regular intervals along each route – and particularly at corners and at intersections to direct users and keep them on the correct trails. The user must clearly be able to see where to go from the trailhead sign to the trail access point. If the entrance to the trail cannot be seen from the trailhead, directional signage may be used to point the way.

At Intersections:





- Trail markers should be installed a couple of metres prior to an intersection.
- A trail marker should be installed 10 20m from the intersection to confirm the user has taken the correct path. (Users should be able to see this confirmation marker from the intersection).
- Where a trail has no intersections or other options, trail markers do not need to be installed.
- For single direction trails always install 'no entry signage' at intersections that cross single direction trails, or at the exit points of single direction trails

Waymarking signs should be placed between 0-1.5m above the ground (900mm recommended) depending on the terrain and the seasonal effects of vegetation. The height chosen should remain consistent and the marker (triangle or arrow) should be mounted with the apex pointing toward the direction to be followed. Trail markers are usually located on the left side of the main trail direction for loop trails. Two-way trails will require bi-directional markers.

### 3 Directional

Directional signage directs users to a trail head from the town or from other key landmarks. Where a trail meets another trail or multiple trails it may be useful to install directional signs that point to a destination e.g. to the trail head, or to a car park. It may be useful to use orientation signs with a map and 'you are here' points at these locations.

## 4 Interpretive signage

Interpretive signage is generally used to describe natural or cultural heritage information to engage the visitor in the experience on the trail. Interpretive information can be provided at a Trail Head, and is often included in walking trails which are specifically designed to be interpreted experiences. Interpretive signage can also be used to highlight a particular point of interest.

## Management signage

This would generally be used in instances where a trail is temporarily closed or realigned due to natural hazards or incidents.

Overall trail signage should be obvious without being obtrusive to the natural environment. Signs should never be attached to trees or other vegetation as not only is it destructive, it also creates maintenance issues.





Specifically, signs should be placed with consideration of approach speed, space to manoeuvre without obstruction or blocking the pathway for other users, offer clear visual lines of other trail signs and minimise the potential impact on the views of the landscape. The approach speed should allow three seconds for people to view and read the sign and also enough time to make a decision on the relevant action prompted by the sign. As a general rule, signs should be placed at a height within half a meter above or below the forward line of vision, depending on the angle of the sign.

Signs should also be located and positioned where their attention does not create a hazard or obscure a hazard. Surrounding vegetation or environmental effects such as sun glare should also not impact on the visibility, legibility and durability (fading of the text) of the sign information.

### **Branding**

Trail signage should be standardised across the City of Albany, through the use of the Albany Trails Hub brand and consistent colouring to guide all trail signage. The trail markers should have a distinguishing symbol or logo for each trail but this should be consistent with overall branding.



