CANMORE NORDIC CENTRE PROVINCIAL PARK

Summer Use Trail Master Plan

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CANADA

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Summer Use Trail Master Plan

Presented to:
Canmore Nordic Centre Provincial Park
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Disclaimer

The following information is provided as advisory material to the Canmore Nordic Centre Provincial Park for the purposes of proposing the summer use trail master plan. No other use of the material is authorized, expressed, or implied. The information is assumed to be accurate and acceptable at the time it was created, but no warranty is made regarding the temporal nature of the information.

Prior to reviewing this document, it is recommended that readers become familiar with the information found in *Trail Solutions: IMBA's Guide to Designing Sweet Single Track and Managing Mountain Biking: IMBA's Guide to Providing Great Riding* to gain important background information regarding the concepts and terms used herein.

Executive Summary

Executive Summary

The International Mountain Bike Association (IMBA) Canada's Trail Solutions team is pleased to provide a Summer Use Trail Master Plan for the Canmore Nordic Centre Provincial Park. The purpose of this Summer Use Trail Master Plan is to provide the Canmore Nordic Centre with a strategy for making improvements in the park to ensure environmental protection and visitor enjoyment.

The Canmore Nordic Centre is part of Alberta's park system. The Centre is a popular area for summer use trails activities including mountain biking, hiking, disc golf, orienteering, trail running and roller skiing. This area serves as both a destination and an access point to trail systems that spans the whole Kananaskis Country, Banff National Park and the Town of Canmore.

Since 1986, a formal and informal trail network has been created for both summer and winter recreation. The sixty-plus kilometres of winter-use (double track) trail require very little improvement as they were designed in an environmentally and socially sustainable manner. Renovations, based on public feedback, were completed in 2008, bringing the competition trails back to international standards and recreational trails to a more beginner-friendly level.

The approximately 30 km of single-track (summer-use) trail at the Canmore Nordic Centre was purpose-built by amateur, volunteer trail builders for events. Close to 75% of this trail (22 km) was constructed between 1988 and 2000 and has not been rehabilitated since. This poor planning and lack of maintenance has resulted in environmental damage, including soil compaction, erosion and damage to the forest habitat. Further the trails have spread and were not constructed in a recreational user-friendly loop system.

The Summer Use Master Trail Plan for the Canmore Nordic Centre is based on existing planning documents that are in place for the Centre, including:

- Plan 4 Parks (April 2009)
- Bow Valley Protected Areas Management Plan (September 2002)
- Recreational Opportunities Working Group (ROWG) Plan (updated Summer 2009)
- Alberta Recreation Corridor & Trails Classification System (May 2009)

These existing plans carry general and specific recommendations for the nature and layout of trails and facilities at the Canmore Nordic Centre. This Summer Use Master Trail Plan document builds on these recommendations and provides a specific implementation plan to enhance the Centre.

This Summer Use Trail Master Plan will address social and environmental issues currently associated with summer trail use. This plan includes:

- Redesign of the trail loop system to aid in way-finding
- Design and construction of introductory single-track trails that are part of the loop system, to aid in skill development of beginners and youth.
- Design and construction of additional "freeride" and "downhill" trail to accommodate the growing mountain bike segment.
- Trail alignments to accommodate wildlife and environmentally sensitive areas
- Signage recommendations to aid in way-finding and trail information
- Restoration plans for closed and decommissioned trails
- Event loops for elite cross country and marathon races that:
  - ~ Meet the needs of the international sport bodies
  - ~ Protect the natural environment of the existing trails
  - ~ Protect the integrity and construction of the trails
  - ~ Showcase the "best" that the park has to offer
  - ~ Withstand the unique use demands.

The plan is divided into four parts:

Part 1: Site Inventory: provides an overview of the existing conditions and current management initiatives.

Part 2: Recommendations: outlines suggested improvements to the trails including trailheads and access, trail design and management, signage and way-finding.

Part 3: Trail Design and Maintenance: provides a brief description of trail construction standards, techniques and trail type definitions.

Part 4: Implementation: provides a detailed work schedule for completion of the plan (2009-2013).

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Part 1: Site Inventory

Site Inventory

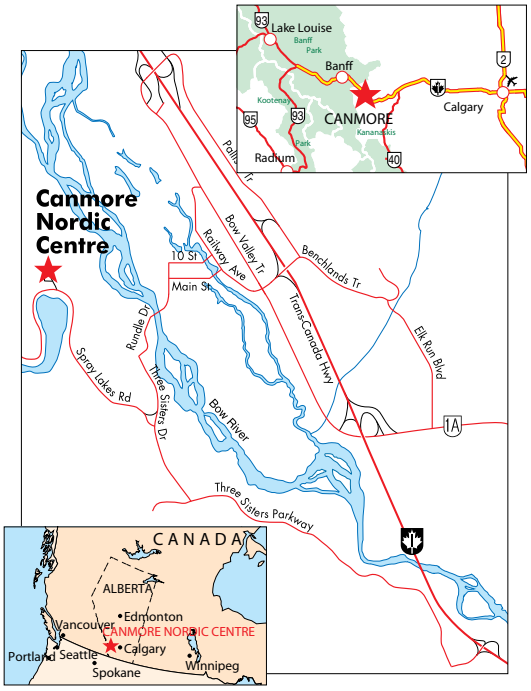
1

Study Area Context

The Canmore Nordic Centre Provincial Park is located in Canmore, Alberta, Canada. The Park is part of Kananaskis Country and the larger Alberta Provincial Park system.

The facility area is located at 1988 Olympic Way, Canmore, Alberta T1W 2T6. This is approximately 4 km from downtown Canmore, off Alberta Provincial Highway 742. The Park is approximately 105 km west of Calgary, easily found by driving along the TransCanada Highway.

The Canmore Nordic Centre Provincial Park is approximately 480 hectares and ranges in elevation from 1350 to 1650 metres. Maps outlining the boundaries of the park can be found in Appendix 1. More information on the Park is available in the Bow Valley Protected Areas Management Plan (September 2002).



Study Process

A review of the study area and its context was conducted over the summer season of 2009. The majority of the review was during the week of July 18th to 24th. This work included:

- Walking and riding the existing trails using a global positioning system (GPS) unit to accurately map and to become familiar with the existing trail network.
- Reviewing current maps of trail system to better understand the most popular trails in the system.
- Meeting with specialists to review and understand the wildlife constraints in the area.
- Design and mapping of new trails.

In addition to the physical assessment of the trails, a number of social factors were considered for the development of trail management recommendations:

- Typical users / range of users
- Ability of users
- Common access points and traffic patterns
- Equipment of users

Public Consultation

A series of two public open houses were held in order to best understand what the users wanted. As well as open houses several small meeting were held to ensure that all user voices were heard.

Open House #1

The first public open house was held on Monday July 20th at the Canmore Nordic Centre. Approximately 30 local residents and park users were in attendance, the users ranged from mountain bikers, and hikers, to parks planners. The purpose of the first open house was to brainstorm the trail plan.

A series of questions were posed to participants. The questions and answers can be found in Appendix 2. Overall, the participants were excited about the trail plan and were happy to provide answers and comments.

1 Site Inventory

Several smaller meetings were held during the week of July 18th to July 24th for key individuals who expressed an interest in the planning process but were unable to attend the open house. The comments collected from these meetings were:

- Keep the Coal Chutes, but create an easier alternative
- Create a permanent 24 Hour race loop
- Create a permanent Canada Cup Race loop
- Keep the races off of the single track
- Bring back more of the old downhill trails
- Do not "dumb down" the trails
- Add more flow to the trails

Open House #2

The second public open house was held on Thursday August 20th at the Canmore Nordic Centre. Approximately 5 local residents and park users were in attendance. The purpose of the second open house was to preview the draft plan and to obtain feedback.

At this point a draft trail plan was proposed and was generally well accepted. Some suggestions were made about incorporating some additional trail to the plan. These suggestions were implemented into the plan.

During the review of the existing trail system, an assessment was made of current trail conditions to determine the need for closure, rerouting and/ or improvements to the existing tread. The following factors were visually assessed:

- Tread slope relative to side slope
- Erosion and soil conditions
- Tread width
- Trail braiding
- Tread creep
- Water drainage and tread out slope
- Safety, including sight lines, trail corridor width, and hazards
- Flow and efficiency, including speed of trail users
- Effectiveness of trail within the context of the larger trail network
- Presence of positive and negative control points
- Aesthetics

Summary of Existing Conditions

Trailheads and Access

The Canmore Nordic Centre Provincial Park borders the Town of Canmore, Highway 742 (Smith-Dorrien Trail/Spray Lakes Road), Banff National Park, and the Bow Valley Wildland Park. As such, there are many ways to access the Canmore Nordic Centre.

In the winter, most visitors drive from town at park in one of the approximately 300 parking stalls adjacent to the Day Lodge.

In the summer, many more visitors will propel themselves to the Nordic Centre. The key access points are as follows:
(For a map, see Appendix 3)

- Highway 742 / Main Canmore Nordic Centre entrance
- "TransAlta Stairs" (Leading from Town of Canmore) via Canmore Trail, Narnia, TransAlta powerline right-of-way or Georgetown Interpretive trail
- Rundleview Connector Trail
- Banff National Park – Rundle Riverside Trail
- Grassi Lakes Trailhead – toward Highline Trail or toward Canmore Nordic Centre

Popular Use

The Canmore Nordic Centre is a popular destination in the summer months for a variety of recreational activities. The most significant summer use group are cyclists. Trail Runners, Hikers, Rollerskiers, Orienteerers and Disc Golfers are also frequent users of the centre.

The centre also hosts a very small population of users with a physical disability, as the national training centre for the National ParaNordic ski team and others. The Canmore Nordic Centre management plan limits recreational use to "non-motorized" users and excludes equestrian use.

A short trail use study was done with TrafX counters from June 22 to July 20, 2009. The TrafX counter counts the number of trail users as they pass through an infrared beam on a portion of the trail. The trail counter was placed on the EKG (orange) trail for the duration. Over the course of the study 1,531 users passed through the infrared beam. The average daily use during the week is 51.8 passes and the average daily use during the weekend is 70.9 passes.

1 Popular Use

Based on this study we can assume that the Canmore Nordic Centre trails are very popular with the local users (weekday use) and are also a popular destination for non-local users (weekend use). The EKG trail, at the time was the only signed mountain bike trail at the venue and the only continuous single track loop – thus, far and away the most popular trail.

Cycling

Cycling is the most popular form of summer trail recreation at the Canmore Nordic Centre. This is due to Kananaskis Country, Bow Valley and the Canmore Nordic Centre's reputation as a premiere mountain bike trail destination and also because several mountain bike races are held on the Canmore Nordic Centre trail system annually.

Cycling can be further sub-divided into a number of different categories. It should be noted that the types of skills required, equipment used, expectations and type of trail experience desired varies with each user group (for more information, please see Appendix 4).

Cross Country Mountain Bikers are the primary category of users at the Canmore Nordic Centre lands adjacent to the Day Lodge. There is a specific site designed for Mountain Bike Skills and dirt jumping where daily use is observed.

Freeride and Downhill mountain bikers frequent the Canmore Nordic Centre lands (trails) adjacent to Grassi Lakes (Reclaimer and Riders of Rohan). These trails are heavily used on a daily basis from early spring to late fall and even in the winter months.

Similar to the Cross Country Mountain bikers, the Centre's lands are extensively used by recreational cyclists who use the ski trails to enjoy the outdoors, access picnic areas and, for some, ride into Banff National Park.

Trail Running

Trail runners use the Nordic Centre trails for exercise, and training, on natural surface trails, rather than paved trails or streets. Use patterns and motivations are suspected to be similar to those of XC mountain bikers, i.e. endurance and technical challenges. Typically trail runners experience the trail with the same flow as a mountain bike and thus, most rail runners will enjoy single-track trails designed with mountain biking in mind.

Hiking

Most hikers gravitate to other exceptional Bow Valley destinations in Kananaskis or Banff National Park. The Canmore Nordic Centre does offer a number of moderate hikes for beginner and intermediate hikers, including Grassi Lakes, which are heavily used. The Banff Trail to the meadow is also to a much lesser extent. It is suspected, with more signage, that the "Alpine Meadows" trail, leaving from the Day Lodge would be a popular alternative to Grassi Lakes in the summer months.

Roller Skiing

The Canmore Nordic Centre provides a 6.5 km paved trail for rollerskiing. Other use of this trail is discouraged as it is heavily used by athletes in the summer months on rollerskis. The paved trail is one of many in the Bow Valley, including a proposed trail from Canmore to Lake Louise, but still sees significant use due to it's proximity to the Biathlon Range and the Bill Warren Training Centre.

1 Popular Use

Orienteering

A new orienteering course was opened at the Canmore Nordic Centre in the spring of 2009. This course has 88 individual control points and the specific routing of four courses (beginner – advanced and mountain bike) is changed three times a year. There were approximately 100 users on the course (excluding events) in the summer of 2009 but these numbers are expected to increase in future years.

Disc Golf

The Disc Golf Course at the Canmore Nordic Centre is one of the most popular in Canada. Although most of the users are local, many users have traveled from across Canada and internationally to play this particular course. On summer weekends and evenings the course is normally at capacity. The disc golf course is isolated or carefully integrated with the other trail and use systems within the Canmore Nordic Centre to avoid user conflict or accidents involving the discs.

Accessible Use

Accessible use trails are trails that are accessible to and usable by people with disabilities. Currently, the only trails that are being used by people with a disabilities are the paved roller ski loop and portions of the Banff Trail (gravel surface road). There are no UTAP designations on any of the trails, nor are any signed or recognized as accessible.

Winter Use

Winter use and accessibility are not addressed as part of this plan. The primary winter use of the Centre is Nordic skiing, including biathlon. Snowshoeing, skating, sledding and many other winter uses have been proposed and should be investigated as part of a general site planning process.

Management Issues

The trails at the Canmore Nordic Centre can be divided into two categories – summer use and winter use trails. The Centre experiences moderate to heavy use in both the summer and winter months by events and the general public on the entire trail system. On average, more than 650 cross country skiers head out onto the trails on a daily basis in the winter months while, in the summer an average of 65 cyclists, per day, travel around the intermediate single-track trail.

More than 60 km of winter use trail was designed for cross country ski and biathlon recreation and competition in the early 1980s for the 1988 Winter Olympics. In 2005 the Centre underwent a major refurbishment and 25 kilometres of trail was re-designed to accommodate international competition standards and provide more recreational opportunities. The winter use trail was carefully designed and built to be environmentally sustainable and user friendly. The only maintenance required on the winter use trail relates to improving the surface of the trails that were refurbished in 2008 to make them hold early snow better and delineating the existing trail so the trail path is easier to follow in the summer months.

There is approximately 30 km of single-track trail that is primarily used in the summer months by mountain bikers, hikers, and trail runners. Most of the single track trail was purpose-built by amateur, volunteer trail builders for events. Close to 75% of this trail (22 km) was constructed between 1988 and 2000 and has not been rehabilitated since. This poor planning and lack of maintenance has resulted in environmental damage, including soil compaction, erosion and damage to the forest habitat. Further the trails have spread and were not constructed in a recreational user-friendly loop system.

The Nordic Centre's paved trail, disc golf course and orienteering course will not be addressed in this plan. These features were all built for summer enjoyment and elite athlete training and are considered to be in good condition only requiring regular maintenance.

Trail Design

There are a number of concerns with the trail design pertaining, especially to the single-track trails. Many of the trails are at the more difficult or very difficult level. The only trails available for beginners are the doubletrack. Options are limited for easy introductory single track trails where users can have a "loop" experience.

User Conflict

Trails are used by a range of user groups including hikers, trail runners, and a variety of mountain bikers. In some areas the trails are steep, narrow, and eroded which could cause a conflict if two users need to pass one another. Conflict is not considered to be a major issue on the Nordic Centre's trails, but as the popularity of the trails and the diversity of trail users increase there may be some conflict.

In some areas visibility can be improved to allow for users to see one another in advance. Signage regarding proper trail etiquette and who has the right of way can also be posted.

1 Environmental Issues

Access

Currently the Nordic Centre's trails can be accessed from various locations around the park. However, only a few of these access points to the park are signed. A main trailhead access needs to be recognized in the Nordic Centre and secondary trailheads should be recognized at other points of access.

Signage & Wayfinding

Signage in the park is limited. Mapping and directional signage does exist, although these maps are confusing and lack information. Poor signage makes it difficult for users to navigate through the trails. A full signage program needs to be designed for both winter-use and summer-use trails as part of this planning process.

Interpretation

There is little information available to users pertaining to the environmental or cultural characteristics of the Canmore Nordic Centre. Although this information is not critical to the success of the trail system it is a nice feature for recreational users who want more than a pure trail experience.

Environmental Issues

Erosion of Trails

Many of the trails at the Nordic Centre were never properly designed or constructed. In many cases the trails represent desire lines between a start and destination point, and fail to respect the vegetation, soils and topography of the site. As a result, sections of trail:

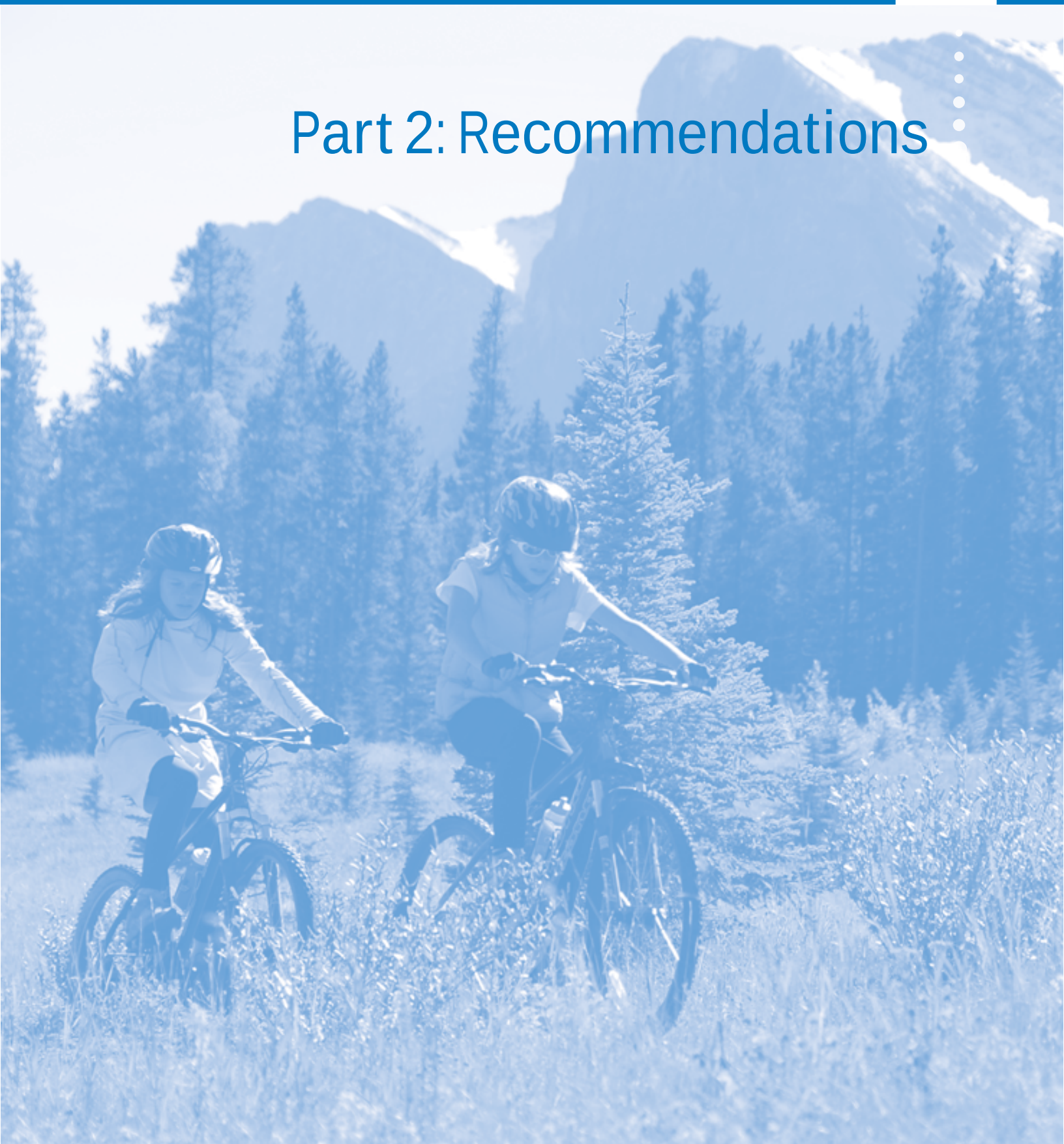
- Do not drain properly.
- Impact vegetation and tree roots.
- Run directly up/down the fall line of slopes making the trail highly susceptible to erosion.

Human / Wildlife Interaction

The Canmore Nordic Centre has one of the highest concentrations of human use in Kananaskis Country. It is also a significant corridor for animals, including elk, bears, cougar and coyotes. A lack of designated trails at the Nordic Centre, poor mapping and signage, and numerous access points all contribute to a lack of guidance for visitors and more difficulty in keeping them away from closed or high-animal-use areas.

2

Part 2: Recommendations



Recommendations

2

Introduction

Trail design and management at the Nordic Centre must address the need and demand for sustainability in order to achieve a balance of providing recreational opportunities with protecting the natural environment.

The trail system at the Canmore Nordic Centre needs to be designed to reflect the specific conditions of the park to provide a sustainable system of trails, and also to provide a suitable experience for the trail users.

Multi-use recreational trails can be designed to be environmentally and socially sustainable. A sustainable trail may be defined as a trail that has minimal impact on the natural environment, requires little maintenance, meets the needs of the users and minimizes conflict between different user groups.

The development of a sustainable trail network must therefore address the physical impact and design of a trail, as well as the "why, who and what" of how the trail is used. Understanding these elements is critical to successfully designing a sustainable trail network.

The following key questions must be answered to ensure the design of the trail network meets the demand of its users:

- Why is the trail needed?
- Who will use the trail?
- What kinds of experiences are we trying to create?

In brief, based on assessments of the current trail condition, and input from the public open houses, these questions may be answered for the Nordic Centre's trail network as follows:

Why is the trail needed?

- To provide access to public natural environment parkland for recreation, exercise, and nature appreciation while minimizing negative impact to the natural environment.

Who will use the trail?

- Multiple users. Primary users are mountain bikers.
- People of all ages and levels of fitness.
- Accessibility – highly accessible although limited access to wheelchairs depending on individual ability and equipment.

What kinds of experiences are we trying to create?

- Beautiful natural setting
- Quiet and solitude
- Exposure to and appreciation of flora, fauna, geological features
- Exercise and physical challenges
- Continuous and varied trail network

Factors affecting trail design and management:

- Location of trailheads and access
- Stacked loops
- Directionality
- User groups and multiple use trails
- Tread width
- Tread surfacing
- Drainage features
- Water crossings
- Vegetation management zones
- Natural environment feature protection
- Use of gateways, control points, anchors, flow
- Filters and other safety consideration

Trailheads and Access

2

Trailheads and Access

See Appendix 5 for a map of all the trailhead locations.

Primary Trailheads

Two primary trailheads will be established at the Canmore Nordic Centre. One will act as the major trail head for winter-use and also as a guide-point to the summer-use trailhead. This winter-use trailhead will be located at the west end of the Day Lodge.

The summer-use trailhead for the Nordic Centre will be located in the Biathlon Mass Start Area at the south west side of the Biathlon Range. This trailhead is located at the primary access point to the summer (single-track) trail system. It is also the best location for beginner to intermediate cycling terrain and separates winter users from summer users. The large kiosk sign will be a good introduction and way finding point for users to locate the trails.

Both trailheads will act as a beginning point for park users. The trailhead signage will clearly identify the name of the access point, provide explicit warnings regarding user safety and liability, indicate rules and regulations, outline trail etiquette, and provide trash and recycling receptacles. A large-scale trail system map will be an integral part of the trailhead.

Secondary Trailheads

Secondary trailheads are smaller and less developed than primary trailheads, but serve similar functions. They should have a map, basic rules, and emergency contact information. Six secondary trailheads are identified:

- Canmore Trail at Town of Canmore Lands (top of Stairs)
- Back Door at Highway 742 (Grassi Lakes Access Point)
- West end of Banff Trail (Banff National Park)
- Disc Golf Course (at Parking Lot P2)
- Soft Yogurt trailhead (at Parking Lot P3)
- Day Lodge (east end, former trail head for recreational skiing

Canmore Trail (Town of Canmore Lands)

This trailhead will be located at the north-east side of the Nordic Centre's property. Users accessing the trails from the Town of Canmore will climb up the stairs then ride into the trails from this location. It will have directions to the Day Lodge and the summer and winter trailhead.

Back Door at Highway 742

This trailhead will be located at the south-east side of the Canmore Nordic Centre property. Users accessing this trailhead will be coming from the Grassi Lakes parking lot or riding in from the Highline Trail. This will have a trail map and directions to the Day Lodge and summer trailhead.

Banff Trail (Banff National Park)

This trailhead will be located at the west side of the Nordic Centre property. Users accessing this trailhead will be coming from Banff National Park. This will have a trail system map and directions to the Day Lodge.

Disc Golf Course

Located on the access trail to the Disc Golf Course at Parking Lot P2, this trail will outline Disc Golf Course use regulations and direct users to the practice hole and hole 1.

Soft Yogurt

This trailhead will be located at the top of the freeride trails area, found on the north side of the main road coming into the Nordic Centre. This trailhead will make the access to the freeride trail more visible and reference any required regulatory information.

Day Lodge (East End)

The primary purpose of this trailhead is to re-route people to the primary winter or summer trailhead. The east end of the Day Lodge used to be the primary trailhead and it is closest to the main parking lot so a lot of users miss the primary trailheads if they do not go into the Day Lodge for information.

Tertiary Trailheads

These will be located at the beginnings of the recommend loops in the stacked loop system. They will feature a locator map that includes the entire trail, symbol to follow, distance, and elevation profile.

Connections to Other Trail Systems

The Nordic Centre trails are not used in isolation: they are frequently a departure point for (or destination from) rides that extend into other jurisdictions throughout the Bow Valley. Some formal connections exist to these other trail systems, while others need to be improved and/or created. The connections include:

- Town of Canmore connection
- Highline trail connection
- Banff National Park connection

More information on the trails that will make these connections is available in the next section (Designated Trail System). These connections will all have secondary trailheads and be valuable and important parts of the overall trail system at the Canmore Nordic Centre.

Trail Use

2

Trail Use

Directionality

All trails will be designed for bidirectional travel. This increases the useable total kilometres of trail. It also adds variety and challenge to all of the trails. Bidirectional trail is expected to reduce user conflict as many trails are currently used in both directions, despite signage indicating one-way trail. Making the trails bi-directional will encourage all users to be aware of the potential for oncoming traffic and ski/ride with proper caution.

Some measures may be taken to reduce conflict due to bidirectional trails, including:

- Ensuring sufficient sightlines
- Encouraging proper trail etiquette
- Posting signage at trailheads, intersections and descents/ascents indicating trail are multi-use and bidirectional ("descending riders/ skiers have the right of way; please stay right)

Designated Use Areas

For the majority of trail networks and trail users, multi-use shared trails can be managed successfully with minimal conflict. The Canmore Nordic Centre trails and users are no exception. However, some uses, due to the nature of the use may be better suited to a separate designated area.

Three such uses are found within the Nordic Centre's trail network. They are:

1. Mountain bike skills park / dirt jump park
    a. Mountain Bike Users only in the summer months.
    b. Winter use may be investigated in future years as part of a park upgrade.
2. Mountain bike freeride trails
    a. These trails will be designated one-way and appropriate signage posted at the "bottom" of the trail to discourage reverse direction use by cyclists and pedestrians
3. Roller ski trails
    a. This trail is preferred use. Cyclists, hikers, and runners are not prohibited but must yield to rollerski traffic.
4. Disc Golf and Orienteering
    a. These areas, by default, are preferred use.

Accessible Use

Accessible use trails are trails that are accessible to and usable by people with disabilities. Currently the only trail that is being used by people with disabilities is the paved roller ski loop. With modern advancements in modes of travel for people with disabilities more trails can be opened up. For example the surfaced ski trails (Banff Trail) can be recognized as an accessible trail. In the future more technical trails can also be opened to accessible use.

Over the next five years UTAP assessments should be done on all winter and summer use trails and the trails signed with their appropriate UTAP ratings. Skills for this can be developed in-house or contracted to professionals.

Trail Types

2

Trail Types

The proposed designated trail system for the Canmore Nordic Centre reflects the need for a variety of difficulty levels and types of experiences. The plan includes the following trail types:

1. Double track (no new construction planned, existing double track and ski trail is sufficient)
2. Easy single track
3. More difficult single track
4. Most difficult single track
5. Race trails
6. Freeride trails

By providing a variety of options for trail experiences and a progression of trail difficulty levels, users may be more likely to choose appropriate trail for their skill level, lowering the risk of injury, and lead to more enjoyable experience for all trail users.

The location of these trail types are based on a number of different factors including:

- Ease of Access
- Connections to other trails and location within the stacked loop system
- Proximity to the Day Lodge, Stadiums and other facilities
- Elevation changes and influence of terrain on "flow"
- Impact of the trail on the natural environment

Designated Trail System

The proposed Designated Trail System identifies a formal network of approximately 30km of single track trails. The identified network of designated trails presented in the trail plan include a combination of existing trails and new alignments to circumnavigate unsustainable sections in order to maintain a logical route for trail users. In developing the proposed Designated Trail Network, existing trail alignments have been included wherever possible, with rerouting or new trail alignments identified only when necessary in order to ensure a sustainable network.

All trails in the designated trail system will be multi-use trails designed and built for all types and levels of use. Types of use include, but are not limited to: hiking, trail running, and mountain biking.

See Appendix 6 for trail construction specifications.

See Appendix 7 for IMBA's trail difficulty rating system.

See Appendix 8 for maps of the trail system.

Easy Trail (Single Track)

The easy trail will be a multi-use natural surface trail. Natural surface could be natural mineral soil found in the work area or imported mineral soil and material. It will feature a subtle rolling contour with minimal grade changes. It will focus on introducing new trail users to the outdoor experience and act as the first trail in the network.

There should be no mandatory obstacles, such as roots, rocks, steps, over 2 inches in height. Minimal optional features, such as rocks, roots, steps, and interpretive signage may be appropriate for this trail.

Recommended easy trail (single track) includes
(See Appendix 8 – green lines on the map):

- Get In (Green Loop): 1.5 km
- Get Out (Green Loop): 2 km
- Baby Beluga (Blue Loop): 3 km
- Canmore Connector Trail

More Difficult Trail (Single Track)

The more difficult trails will be multi-use natural surface trails. They will feature a subtle rolling contour with grade changes. These trails will be accessed from the Easy Trails at the main trail head. The more difficult trails will provide a more challenging experience in both the skill required and the level of fitness required.

The trail tread will be easily passable for the majority of the loop with optional features off to the side of the tread.

Recommended more difficult trail (single track) includes
(See Appendix 8 – blue lines on the map):

- EKG (Orange Loop): 8 km
- Far Perimeter (unnamed): 15 km
- Banff Connector Trail (Departs EKG): 6 km (one-way, to Banff National Park Boundary from Day Lodge)
- 24 Hours Event Loop: 18 km (see Appendix 9 for a map)
  - ~ This loop will also incorporate double track and other technical features required of a race loop.
  - ~ The purpose of this trail is go have a permanently marked race trail riders can pre-ride and volunteers can identify with.
  - ~ This trail will be built to a higher standard of environmental sustainability to withhold the unique demands of high traffic, in varying weather, over a very short period of time.
  - ~ This trail will start and finish in the Cross Country Stadium (as in the event)

Trail Types

2

Most Difficult Trail (Single Track)

The most difficult trail will be a multi-use natural surface trail. It will feature a subtle rolling contour with grade changes. The trail will be accessed only from the more difficult trails. The most difficult trails will provide a more challenging experience in both the skill required and the level of fitness required

The trail tread will be easily passable for the majority of the loop with optional features off to the side of the tread.

Recommended most difficult trail (single track) includes (See Appendix 8 – black lines on the map):

- EKG East (Yellow Loop): 4 km
- The Terminator (2012 construction): 10 km
- Elevator Shaft & Coal Chutes (EKG Option): 8 km
- Highline Trail / Grassi Lakes Connector (Departs Back Door): 4 km (one-way, to Highway 742 from Trailhead)
- Canada Cup Event Loop: 6.5 km (see Appendix 10 for a map)
  - ~ One loop will be signed and map although the actual race course may vary from year to year.
  - ~ Variations of this loop to accommodate different categories in competition may be outlined on a per-event basis but will have no effect on the signage or mapping of this loop.

Freeride Trails

The freeride trails will all be natural surface trails. They will feature steep grades, large berms, jumps and other technical trail features. The primary access and egress for these trails will be from a roadway to permit vehicle transportation from the bottom to top. The freeride trails will provide a more challenging experience in the skill required.

The trailhead will be easily passable for the majority of the loop with optional features off to the side of the tread. Although not enforced, users will be encouraged to use these trails in one direction only.

Recommended freeride trail (single track) includes
(See Appendix 8 – red lines on the map):

- Soft Yogurt
- Reclaimer (Grassi Lakes area)
- Riders of Rohan (Grassi Lakes area)
- Unnamed (2013 construction)

Bike Parks

There is one mountain bike skills park at the Canmore Nordic Centre. This park incorporates dirt jumps, a pump track and various skill building tools including graduated drops, "skinnies," teeter-totters, and other obstacles. In general, this park meets the demands of the riding community.

The major concern with the existing park is that it is not located at an ideal location within the trail system (it is located approximately 0.5 km from the summer trailhead). The ideal location for a skills park is at a trailhead where groups can entertain themselves as they wait for others to join while practicing their mountain bike handling skills.

Two additional parks are proposed for the Canmore Nordic Centre and will be located at the summer trailhead and at the freeride trailhead. These parks will not be as extensive as the existing park, nor will they entirely replicate features in the existing park.

- **Summer Trailhead**: will contain beginner, intermediate and advanced features that can be found on the cross country mountain bike trails. This may include bridges, skinnies, rocks, logs, among other things.
- **Freeride Trailhead:** will contain beginner, intermediate and advanced features that can be found on the freeride trails. This may include a pump track, skinnies, logs, rocks and other elements. This park will also encourage users to visit the existing park for dirt jump opportunities.

It is recommended that this process be continued with a professional skills park consultant to develop design concepts and remain involved in the construction process and maintenance plan development.

Recommended bike park locations
(See Appendix 8 – red circles on the map)

2 Signage and Way-Finding

Signage and Way-Finding

There are several types of signs that can be used to help with the trail management issues at the Canmore Nordic Centre. Signs can be divided into three categories:

- Informational/Directional
- Regulatory/Warning
- Educational/Interpretive

All signs at the Canmore Nordic Centre will be designed to the standard of the Government of Alberta (Parks Division) sign regulations..

Informational/Directional Signs

Directional signs provide navigational information – from a simple blaze to elaborate maps. Informational signs, usually positioned at the trailhead, provide details such as trail length and difficulty.

Trailhead Identification Signs

Clear roadside signs directing users to trailheads serve two key purposes: encouraging trail use, and preventing users from creating unauthorized access routes.

- To be posted on the main access road to the Canmore Nordic Centre

Trailhead Signs

Trailhead signs – often called trailhead kiosks – are relatively large installations at the entrance to a trail or trail system. Well-designed kiosks include a complete map and description of all the nearby trails and facilities, local regulations, emergency contact information, and educational messages.

The main trailhead kiosk is an ideal place to describe trail length and relative difficulty. Visitors armed with this information can make smart decisions about which trails to travel. Kiosks might also have information about the area's natural and cultural resources, volunteer projects, a message board, and portable maps or fliers. They are also the best place to collect fees or install donation boxes.

Trailhead signage will also depend on the type of trailhead:

- Primary Trailheads

  Primary trailheads are the major access points to trail systems and should include all types of signage – informational, regulatory, and educational.

- Secondary Trailheads

  Secondary trailheads are smaller and less developed than primary trailheads, but serve similar functions. They should have a map with a "you are here" location, basic rules, and emergency contact information.

- Tertiary Trailheads

  Tertiary trailheads are located at junctions within the staked loop system where secondary loops depart from the main loop. These trailhead signs should contain route information (distance, elevation profile and technical difficulty) along with a map of the loop, relative to the rest of the trail system.

Trail Intersection Signs

Signs at intersections need to provide clear, concise directions for how to stay on the trail or return to a trailhead. In areas where access rules differ among trails (i.e. hiking only permitted on one trail while the intersecting trail also permits mountain biking) ensure the intersection signs clearly indicated the permitted use on each trail. Information on location and how to get response in case of emergency should also be part of the trail intersection signage.

Waymarks

Waymarks are small, simple signs that direct users along the trail. Examples include blazes painted on trees, aluminum or plastic diamonds affixed to trees, and posts sunk into the ground. These signs can be small, so long as they are obvious and clearly mark the way.

Directional arrows or user icons should contrast vividly with the background. In a coordinated waymarked route system, trails are identified by unique blazes that enable users to follow a designated route on interconnecting trails of similar difficulty. Marking routes in this manner is a convenient and effective way of giving visitors a self-guided experience without the need for frequent map checks.

Difficulty Rating Signs

Signs that indicate trail difficulty provide considerable information yet are simple to create and easy to understand. They help trail users make informed decisions and select trails that match their skill level. Placing this information at the beginning of a trail and at trail intersections helps manage risk and minimize injuries. Typically, trail difficulty signs indicate the technical challenge, not the physical exertion. This type of signage can be combined with the trail name signs.

Trail Length and Elevation Gain/Loss

The best way to indicate physical exertion is by posting trail length, and possibly even elevation change, in addition to rating the trail's technical difficulty.

Signage and Way-Finding

2

Regulatory/Warning Signs

Regulatory signs delineate rules, such as prohibited activities, direction of travel, or other restrictions. Warning signs are used to caution trail users of upcoming hazards or risks.

Visitor Rules & Regulation Signs

Regulator signs should be simple and easily digested. Use point form where possible. The goal is to engage the trail user and re-inforce positive behaviour, not to direct, demand, or restrict.

Allowed Activities

Signs at all trailheads and major intersections should indicate which activities are allowed and which are prohibited. Use well-established icons (horse, hiker, bikes) to communicate use and continue use of these icons on the trail system.

Warning Signs

When appropriate, warning signs should be used to mark known hazards. Position them well in advance of the hazard or risk so that visitors have enough time to read the sign and react. Consider adding signs before unexpected challenging technical trail features, like drop-offs, narrow bridges, or other elements of increased risk.

Road/Trail Intersections

Signs should be used to alert motorists and trail users to the intersections of trails and roads. Yield signs, painted crosswalks, stop signs and traffic signals examples of signage used to address road/trail intersections. The amount of traffic will affect the type and number of signs needed. Trail and road intersections should be treated the same as trail/trail intersections or trailheads with trail names, maps, and permitted uses clearly indicated on signage.

Emergency Signs

To facilitate emergency services access, each trailhead or access point should be assigned a physical address and mapped by GPS. This physical address and GPS coordinates should be included on trailhead signs along with emergency contact information.

Intersections and/or other locations within the trail system can also have location identification. Locations should be consistently number and not duplicated.

Educational/Interpretive Signs

Educational signs provide guidelines for responsible recreation and trail etiquette. Interpretive signs describe natural or cultural resources.

Responsible Use

Trail etiquette information should be communicated as part of the trailhead signage. These can be captured as stand-alone signs on key trail segments or at trailheads.

Interpretive Signs

Interpretive signs provide information about points of interest along the trail. They are sometimes posted in a planned sequence to provide in-depth education. Intepretive topics are not limited to nature or history, but can also include skills development tips for mountain biking among many other topics.

In developing signage for an interpretive trail, several objectives should be considered:

- Who is the intended audience: children or adults, groups or individuals?
- What will keep their interest?
- Will the trail be interactive or passive?
- What are we trying to showcase: the unique landscape, history, wildlife, or archaeology of the area?
- What lessons can be learned?
- Is there a theme or story we want to present?
- How can the interpretive trail tie into the broader trail?

3

Trail Design and Maintenance

3 Trail Design and Maintenance

See Appendix 11 for IMBA-recommended resources on Trail Design and Maintenance.

Elements of Sustainable Trail Design

All new trails at the Nordic Centre will meet the 5 key elements of sustainable trail design. These 5 key elements are:

- The Half Rule
- The 10% Average Guideline
- Maximum Sustainable Grade
- Grade Reversals
- Outslope

The Half Rule

The Half Rule states that a trail's grade should not exceed half the grade of the hillside or sideslope that the trail traverses. If the grade does exceed half the sideslope, it's considered a fall-line trail. Water will flow down the trail rather than run across it.

The 10% Average Guideline

Also called overall trail grade, average trail grade is the slope of the trail from one end to the other. To determine the trail's average grade divide total elevation gain by total length, then multiply by 100 to convert to percent. An average trail grade of 10% or less is most sustainable. This does not mean that all trail grades must be kept under 10%. Many trails will have short sections steeper than 10%, with the average still being under 10%.

Maximum Sustainable Trail Grade

The maximum grade is the steepest section of the trail that is more than 10 feet in length. When designing a trail it is essential to determine early in the process the precise maximum trail grades that the trail will be able to sustain in local conditions. Here are some variables that need to be considered for determining a maximum sustainable trail grade:

- Half Rule
- Soil Type
- Rock
- Annual Rainfall Amount
- Grade Reversals
- Types of Users
- Number of Users
- Difficulty Level

Grade Reversals

Grade reversals are undulations in the trail; a negative grade followed by a positive grade. This change in grade forces water to exit the trail at the low point of the grade reversal, before the water can gain more volume, momentum, and erosive power.

Outslope

As the trail contours across a hillside, the downhill or outer edge of the tread should tilt slightly down and away from the high side. This tilt is called outslope and it encourages water to sheet off the trail instead of funneling down its centre.

Trail Construction Standards

3

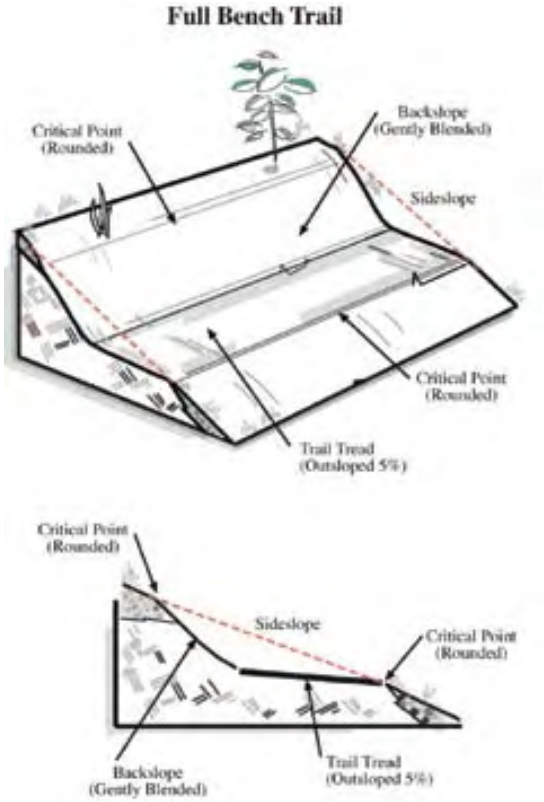
Trail Construction Standards

Construction of the trails will consist of building with natural material. Due to the variety of terrain several construction techniques will be used. Some techniques that will be used are:

- Full Bench Trail
- Partial Bench Trail
- Raised Tread
- Turnpike Construction
- Causeway Construction
- Raised Stone Tread Construction
- Trail Armoring
- Stone Pitching

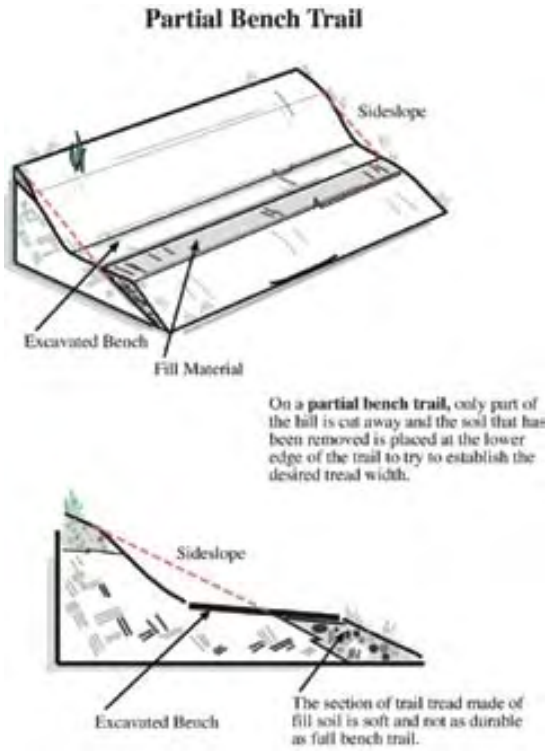
Full Bench Trail

A bench is a section of tread cut across the side, or contour of a hill. A full bench trail is constructed by cutting the full width of the tread into the hillside. The entire tread is dug down to compacted mineral soil. (See *Trail Solutions, IMBA's Guide to Building Sweet Single Track*, page 140 to page 148 – "Bench Cut Trails").



Partial Bench Trail

On a partial bench trail, only part of the hill is cut away and the soil that has been removed is placed at the lower edge of the trail.



Raised Tread

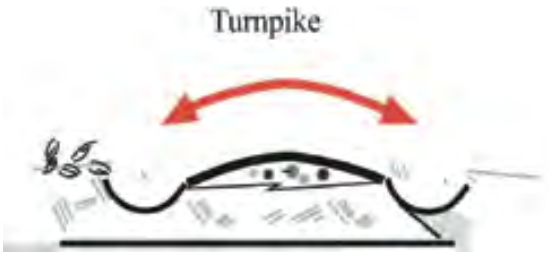
In areas where a trail is located in flat areas and there is no side slope to relocate the trail to, the trail tread must be raised in order to create a sustainable trail. There are several types of raised tread construction techniques that can be used: turnpikes, causeways, and stone raised tread.

Trail Construction Standards

3

Turnpike Construction

Turnpike construction is the process of raising the tread by using fill material excavated from parallel ditches running along the side of the trail. urnpikes are a technique developed for construction trails in wet areas, but this technique also works in flat areas. The build up of material for the tread surface allows water to run off the tread and collect in the side ditches.



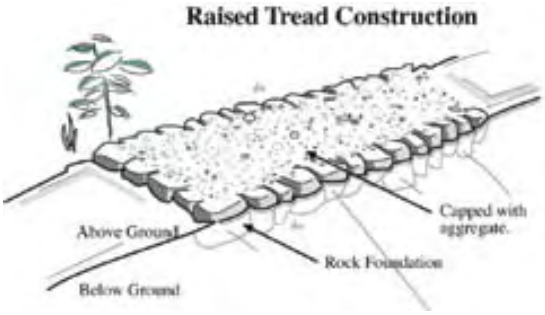
Causeway Construction

Causeways are very similar to turnpikes, however a causeway does not use the side ditches for material to build up the tread surface. Material is brought in, such as gravel with a binder, and/or mineral soil. The imported material is used to raise the tread and then the tread surface is built up using natural mineral soil, from the worksite, to act as a cap.

(See Trail Construction and Maintenance Notebook, United States Department of Agriculture, page 70 – "Causeways"). Causeways are a technique used for constructing trails in wet areas, but work for trails in flat areas as well.

Raised Stone Tread Construction

Raised Stone Tread Construction is the most successful and ideal way of constructing trails in flat areas. A foundation of large rocks are laid in the trail tread, building the tread surface up. Next, a layer of smaller rocks are laid on top, and then a layer of mineral soil is used to cap the tread surface. (See *Trail Solutions, IMBA's Guide to Building Sweet Single Track,* page 164" – "Raised Tread Construction"). There are many techniques for raising the tread surface of a trail. Causeway construction and turnpike construction are found to be the most successful and sustainable methods.



Trail Armoring

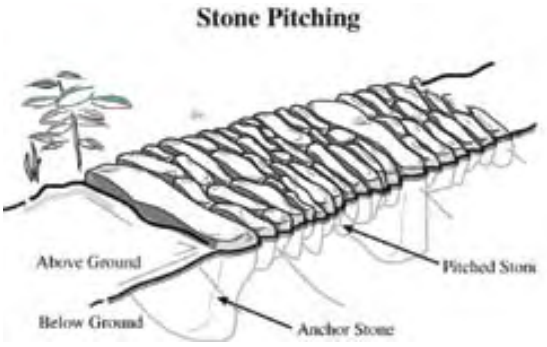
Trail Armoring is a technique of constructing the tread surface with something harder than the natural mineral soil. Materials like geosynthetics (plastic material used to stabilize tread surface), wooden corduroy (laying down a wooden deck and surfacing it with mineral soil), and concrete or other soil additives, are used to harden the surface. The recommended technique for hardening/armoring the surface is to use rocks.

Armoring can benefit a trail by:

- Hardening a contour trail in rainy climates
- Stabilizing steep sections of contour trail with grades from 20 to 40 percent (as long as the contour trail follows the half rule)
- Reinforcing stream crossings
- Crossing a low-lying muddy or sandy area when a reroute isn't possible
- Toughening the trail surface on high-traffic routes to withstand user- caused erosion

Stone Pitching

Stone pitching is a process where medium sized rocks are placed on end, or "pitched" up on their side. The stones are tightly fit together, and smaller rocks and aggregate are packed into the gaps to tighten the construction. (See *Trail Solutions, IMBA's Guide to Building Sweet Single Track*, page 164 – "Stone



Trail Definitions

3

Trail Definitions

The proposed designated trail network for the Canmore Nordic Centre reflects the needs for a variety of difficulty levels and types of experiences. The plan includes the following trail types:

1. Double track
2. Easy single track
3. More difficult single track
4. Most difficult single track
5. Race trails
6. Freeride trails

In accordance to the Alberta Recreation Corridor & Trial Classification System the trail types fall into a newly created set of categories. These categories are:

- Developed
- Semi-developed
- Primitive

These new classifications can be translated as follows:

Developed Trail -> Double Track

Semi-developed Trail -> Freeride Trail, Easy Trail

Primitive -> More Difficult Trail, Most Difficult Trail

Combination (Developed, Semi-developed, Primitive) -> Race Trail

Developed [2]

The trail would have a smooth, hard surface, gentle gradients (up to 10%), and a width of at least 2.5m. Clearing would be 0.5m beyond the trail tread and a minimum of 3m height.

Semi-developed [3]

The trail tread may be surfaced with a granular material such as compacted crushed gravel, gradients would be gentle to moderate (up to 15%), and the width would range from 1m to 2m width. Clearing would typically be 0.5m beyond the trail tread and a minimum of 3m height.

Primitive [4]

The trail would be unsurfaced and could be rough with roots, rocks, or fallen trees, have steep gradients (up to 30%), and be as narrow as 0.2m wide with a cleared area only large enough to accommodate the person and bicycle (1m width and 2.5m height). "

[2] *Alberta Recreation Corridor & Trails Classification System*, Government of Alberta, July 2009, PG 11

[3] *Alberta Recreation Corridor & Trails Classification System*, Government of Alberta, July 2009, PG 11

[4] *Alberta Recreation Corridor & Trails Classification System*, Government of Alberta, July 2009, PG 11

4

Part 4: Implementation

4 2009 Construction Season

The building season in Canmore extends from early April (on some trails) to late October, depending on snow melt rates and snow conditions.

Please reference Appendix 12 for information on estimating the time and costs associated with trail construction.

Please reference Appendix 13 for a map of the entire proposed trail system. Trails are coded by construction year (not by difficulty or loop).

2009 Construction Season

Construction in 2009 was primarily funded via a National Trails Coalition grant awarded to IMBA. Part of the grant covered the costs associated with developing this trail plan while the rest was dedicated to labour and machine costs associated with trail development.

Trail development in 2009 resulted in the construction of approximately 10 km of single-track trail over the course of 8 weeks. The plan focusses on the following priorities: Beginner and easy intermediate trails, freeride trails and event trails.

All of the trails proposed as part of this plan (and shown on the attached map) were approved by Alberta Parks for construction. Most of the trail in this plan has been flagged in the field for design as well as tracked with a GPS. If not formally flagged in the field, a conceptual line has been drawn on the map that is very close to where the eventual trail will be routed.

Easy Trail

- Get In
- Get Out
- Baby Beluga
- Artistic Merit
- Orchid Trail

More Difficult Trail

- FYI
- EKG (rehabilitation work)

Most Difficult Trail

- All parts of Canada Cup Event Loop, including:
  - ~ Mad Handler
  - ~ Hey MacLeod
  - ~ Laundry Chutes
  - ~ Buried Alive
  - ~ Eye Dropper
  - ~ Dipped Cone
  - ~ Devonian Drop

Freeride Trail

- Soft Yogurt

Trail Signage

- Trail signage was ordered for all trail existing and proposed for construction between 2009 and 2012.
- Install/establish secondary trailhead at Disc Golf Course parking lot access point.

4 2010 Construction Season

2010 Construction Season

Construction in the 2010 season will be completed by Canmore Nordic Centre staff and volunteers. This is expected to be the most intensive trail building season of the next quadrennial due to pressure to install the new trail signage as well as ensure the event loops are complete for 2010 summer events.

A more detailed traffic counting program will be implemented in the 2010 season. This will set the groundwork for the establishment of a more refined maintenance schedule.

Easy Trail

- Canmore Connector Trail
  - ~ Through Canmore Nordic Centre lands
  - ~ Alongside stairs leading to power plant (option to pushing bike)

More Difficult Trail

- Parts of the 24 Hour Event Loop:
  - ~ Killer Bees
  - ~ Back Door (including connection to Highway 742)
  - ~ Ziggy's
  - ~ Albertan to Swamp
  - ~ Swamp to Sherwood Forest
  - ~ Coal Chutes – intermediate option
- Reconstruction of all parks of EKG so it is:
  - ~ Bi-directional
  - ~ Intermediate level (some parts are currently classified advanced)

Most Difficult Trail

- Coal Chutes – rehabilitation of advanced option
- Devonian Drop
  - ~ Causeway
  - ~ Transition into Narnia Trail
- Highline Trail – connector from Highline West, through Grassi Lakes to the Reclaimer

Bike Parks

- Install technical difficulty signage
- Replace or repair rotten and deteriorating features (ongoing maintenance plan)

Trail Signage

- Install all trail and bike park signage (per signage order)
  - ~ Names
  - ~ Difficulty (particularly in existing skills park)
- Establish the primary summer and winter trailhead kiosk locations
- Establish / install tertiary trailhead signage, and the following secondary trailheads:
  - ~ Soft Yogurt and Day Lodge (East End)

Ongoing Projects

- Closure of designated trails (renaturalization and rehabilitation)
- Collection of garbage, ribbons, old signage and posts (disposal)
- Rock picking on ski trails
- Corridor cleaning, decking wood along all trails
- Risk assessments on all parts of existing trail and installation of appropriate safety structures or features.
- Installation of Bike Wash Station
- Installation and regular collection of data of TrafX counters located at:
  - ~ Disc Golf Course
  - ~ Get In (beginning)
  - ~ FYI (mid-point)
  - ~ EKG (above XC Stadium)

Other Projects

- Construction of footpath from BWTC to Biathlon Team Rooms (following existing wear, where sustainable)
- Construction of stairs or retention steps from P2 to Disc Golf Hole #18 and Disc Golf Practice Tee.
- Installation of paved connectors on rollerski loop
- Spread woodchips on Ski Trails
- Orienteering Course – control checks and spring maintenance
- Upgrades to Agility Course

Information Management

- Creation of a Database that includes GPS locations and photographs of all:
  - ~ Signs
  - ~ Intersections
  - ~ Bridges
  - ~ Orienteering Points
  - ~ Weather Stations
  - ~ Disc Golf Tees and Baskets
  - ~ Viewpoints
  - ~ Picnic Tables

Administration

- Development of:
  - ~ Summer trail and park assessment tool
  - ~ Summer trail and park inspections schedule
- Revision of orienteering maps to reflect new trails
- Name all powerline trails
- Finish numbering all summer junctions (as trails are completed)
- Create "routes" for all competition trails (XC and Biathlon)

4 2011 Construction Season

2011 Construction Season

The 2009 and 2010 constructions seasons were primarily focused on completion all of the required sections of the two proposed event trails, construction of suitable beginner trail, and other high priority projects. The 2011 construction season will be primarily focused on expanding the recreational trail offering at the Canmore Nordic Centre and finishing connections to adjacent land owners.

The proposed construction in 2011 may be started in 2010, depending on volunteer labour.

More Difficult Trail

- Construction of wooden boardwalk with option lines through "The Swamp"

Most Difficult Trail

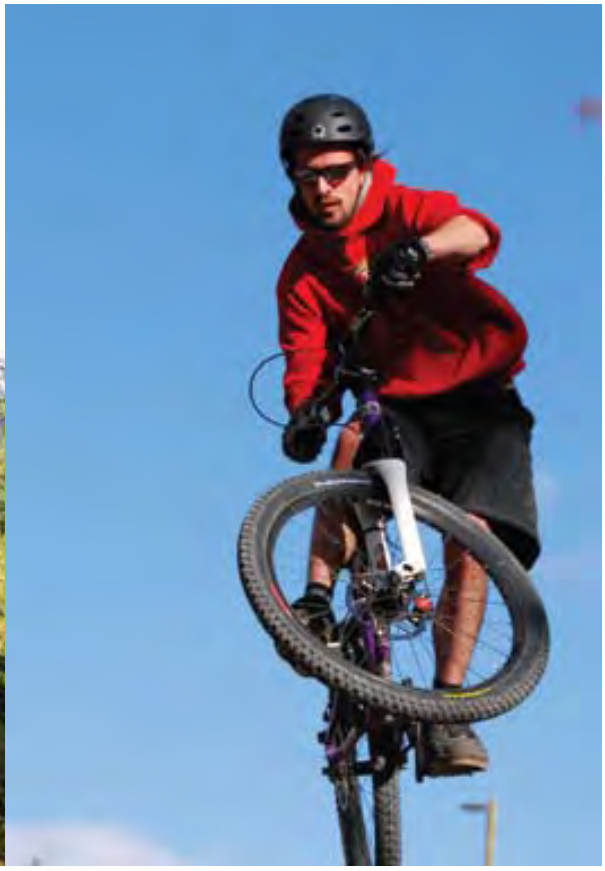
- Sherwood Forest -> Elevator Chutes -> Coal Chutes
- Sherwood Forest -> Terminator (re-build) -> No Homers
- Coal Chutes -> Artistic Merit (climb – two options)
  - ~ Adjacent to current Georgetown Climb double track
  - ~ Adjacent to current "Ass Whupper"

Freeride Trail and Bike Parks

- Construction of second and third free-ride trail (per Jay Hoots design) adjacent to Soft Yogurt (pending grant funding)
- Construction of second and third bike park (approvals pending)
- Order and installation of intepretive (instructional) signage
- Investigation of winter use options – terrain parks
- Investigation of accessibility options (wheelchair use)

Ongoing Projects

- Trail signage
  - ~ Revision and re-order as construction continues
- Interpretive signage for the follow areas, concepts:
  - ~ King of Sweden downhill
  - ~ Beckie's Hill
  - ~ Bjoreger's Corner
  - ~ Biathlon Range
  - ~ Differences between 1988 and 2005 winter trail construction and competition standards
  - ~ Catabatic Winds
  - ~ Sport and Venue history
  - ~ Ecology and wildlife
  - ~ Historical and cultural
- Host naming ceremonies and rename trails after local sport heros and/or Olympians



4 2012/13 Construction Season

2012 Construction Season

Similar to the 2011 construction season, 2012 will be focused on the expansion of the recreational trail network and the rehabilitation and ongoing maintenance of the existing trail network. The 2012 season will also be critical to monitoring usage and understanding the appetite of the trail users.

More Difficult Trail

- Construction of outer trail from Terminator west toward Banff Park, not entering the newly constructed habitat area ("fire break"), and returning to the Meadow
- Construction of Banff Trail Single Track

Most Difficult Trail

Continuation and completion of work on:

- Sherwood Forest -> Elevator Chutes -> Coal Chutes
- Sherwood Forest -> Terminator (re-build) -> No Homers
- Coal Chutes -> Artistic Merit (climb – two options)
  - ~ Adjacent to current Georgetown Climb double track
  - ~ Adjacent to current "Ass Whupper"

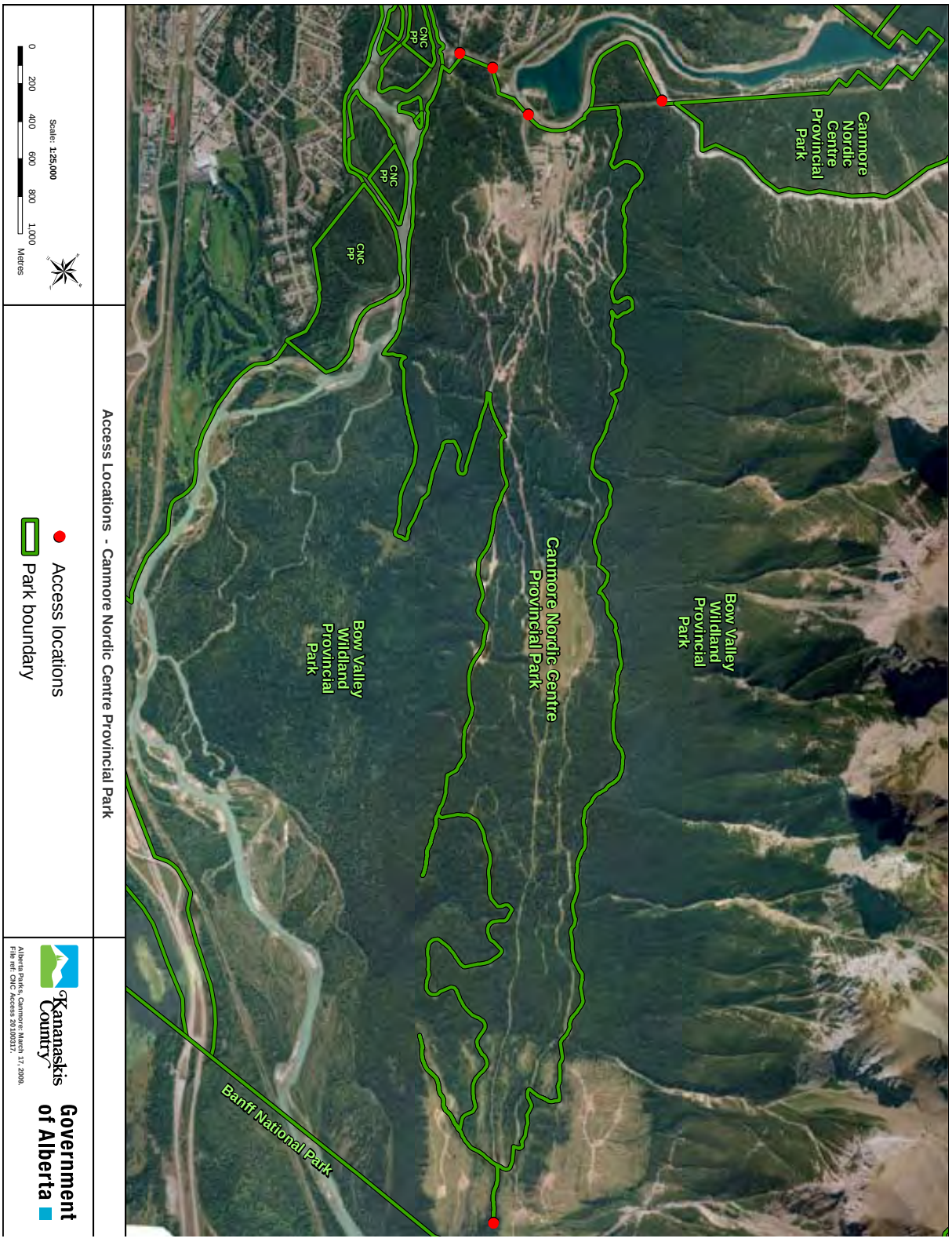
Freeride Trail

- Significant rehabilitation of Riders of Rohan and the Reclaimer

2013 And Beyond

- Investigate accessible use of the trail system (UTAP assessments)

Appendix 1:
Canmore Nordic Centre Provincial Park Boundaries



Appendix 2: Public Consultation Questions and Answers

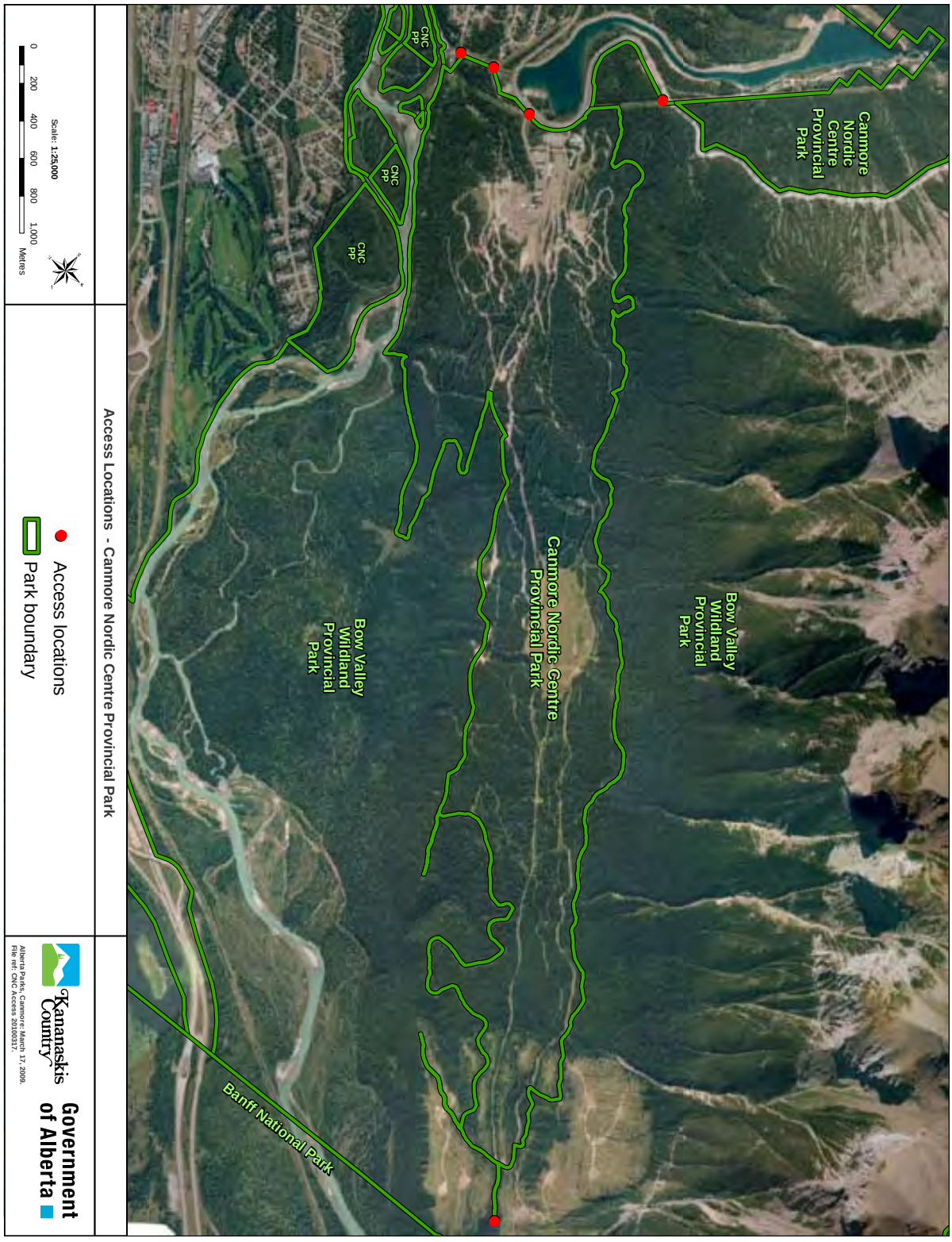
The following are the public's comments and answers to each question (the asterisk represents how many people made the same comment):

1. What would be included in your dream trail?
   - Long – 30km + ***
   - Flowy *******
   - Accessibility **
   - Switchbacks
   - Playful obstacles ****
   - Habitat / setting diversity
   - Shorter loops – 8 to 10 km ****
   - Moderate climbs **
   - Alternative steep climbs
   - Moderate freeride trail
   - Mellow grades **
   - Progression
   - Range of climbing grades
   - Intermediate XC **
   - 10 -20 km loops
   - Running trail
   - Rest point
   - Signage / directions
   - Interconnectivity **
   - Technical climbs and descents ***
   - View points ******
   - Non-linear
   - Loop system ******
   - Natural TTF's **
   - Berms ****
   - Extend further west
   - Buffer trail
   - Epic loop
   - Low maintenance and sustainable

2. What is positive about the current trail network?
   - Quick access
   - Inexpensive
   - Accommodating to different user groups
   - Bike park
   - Facilities
   - Tourism potential
   - Wildlife management
   - Trail connectivity with other areas
   - Good staff and volunteers
   - Parks show piece
   - Community support

3. What is negative about the current trail network?
   - Disturbances (piles of debris)
   - Lack of signage
   - Routed through wet area
   - Some poor soil
   - Unsustainable sections become unridable due to high traffic
   - Lack of TTF's
   - Nothing for intermediate rider
   - Confusing mapping
   - Concentration of trails
   - Very linear trail

Appendix 3:
Current Access Points



Appendix 4: Types of Cycling

Cross-Country Mountain Bikers

Cross–country (XC) riders use trails for recreational enjoyment and for exercise. Riders may use trails several times a week. Tight technical trail with challenging sections and open flowing sections are desirable for the variety of terrain and physical challenge. More experienced riders will carry water, food, tools and repair kits. As skills and endurance develops, longer trails are sought.

Dirt Jumpers

Dirt jumpers will only use trails to access the skills park, and typically will not use the trails for recreational enjoyment or for exercise, due to the fact that dirt jump style bikes are not a comfortable bike for extended pedaling. Dirt jumpers will stay in a specific area.

Freeride Mountain Bikers

Freeriding as a type of mountain biking originated from the North Shore region of British Columbia, where mountain bikers started elevating trails above the saturated ground to stay out of water and mud. The structures built, such as boardwalks, evolved to incorporate purposefully built technical challenges such as elevated ladder bridges, drop offs, skinnies, teeter totters, etc. These man-made structures are considered a type of "technical trail feature" (TTF). In the past couple of years, freeride mountain bikers have begun to add more challenges into the trails by sculpting dirt berms and jumps, and incorporating more flow into the trails.

Similar to XC riders, freeriders, may desire a long trail with features incorporated into or alongside the trail, as an optional experience. Alternatively, similar to dirt jumpers, freeriders may focus their time on one specific area and "session", or repeatedly ride features, in order to develop skills.

Cyclists that are seeking this type of experience often construct structures and secondary trails in hidden areas. The installation of these structures and construction of unauthorized trails is a concern for land managers due to the impact on the natural environment and the safety of the users. The liability of these structures is therefore a common concern for public land managers, and a motivating factor for land managers to work collaboratively with mountain bikers to create an area, or areas, for this style of riding.

Downhill Mountain Bikers

Downhillers seek long challenging descents. Road or lift access to downhill trails so that the rider can "shuttle" to the top and ride down as their bicycles are typically much to heavy to ride uphill.

Recreational Cyclists

Beginner mountain bikers, families with members having varying skill levels and infrequent casual trail users may be considered recreational cyclists. Skill level is generally lower than the above categories and length of trail covered and amount of time on the trails may thus be shorter.

Appendix 5: Trailheads

Appendix 6:
Trail Specifications

Trail Type	Tread Width	Corridor Width	Outslope	Maximum Grade	Length	Options	Recommended Use
Easy Trail	.5 to 1.0 metres	2-3 metres	< 5%	15%	0-2 km	* Optional features such as rocks, roots and steps *Interpretive signage	Multi-use trail designed and built for all types and levels of use. Types of use include, but not limited to: hiking, trail running and mountain biking.
More Difficult Trail	.5 to 1 metre	1-2 metres	5-7%	30%	0-10 km		
Most Difficult Trail	.2 to 1 metre	1-2 metres	5-7%	30%	0-20 km		
Freeride Trail	.2 to 1 metre	1-2 metres	5-7%	30%	0-2 km		

Appendix 7:
Trail Difficulty Rating System

IMBATrail Difficulty Rating System:

	Easiest	Easy	More Difficult	Very Difficult	Extremely Difficult
	White Circle	Green Circle	Blue Square	Black Diamond	Double Black Diamond
	○	●	■	◆	◆◆

Trail Width:

	2 metres or more	1 metre or more	.75 metre or more	.5 metre or more	.25 metre or more

Tread Surface:

	Hardened or surfaced	Firm and stable	Mostly stable with some variability	Widely variable	Widely variable and unpredictable

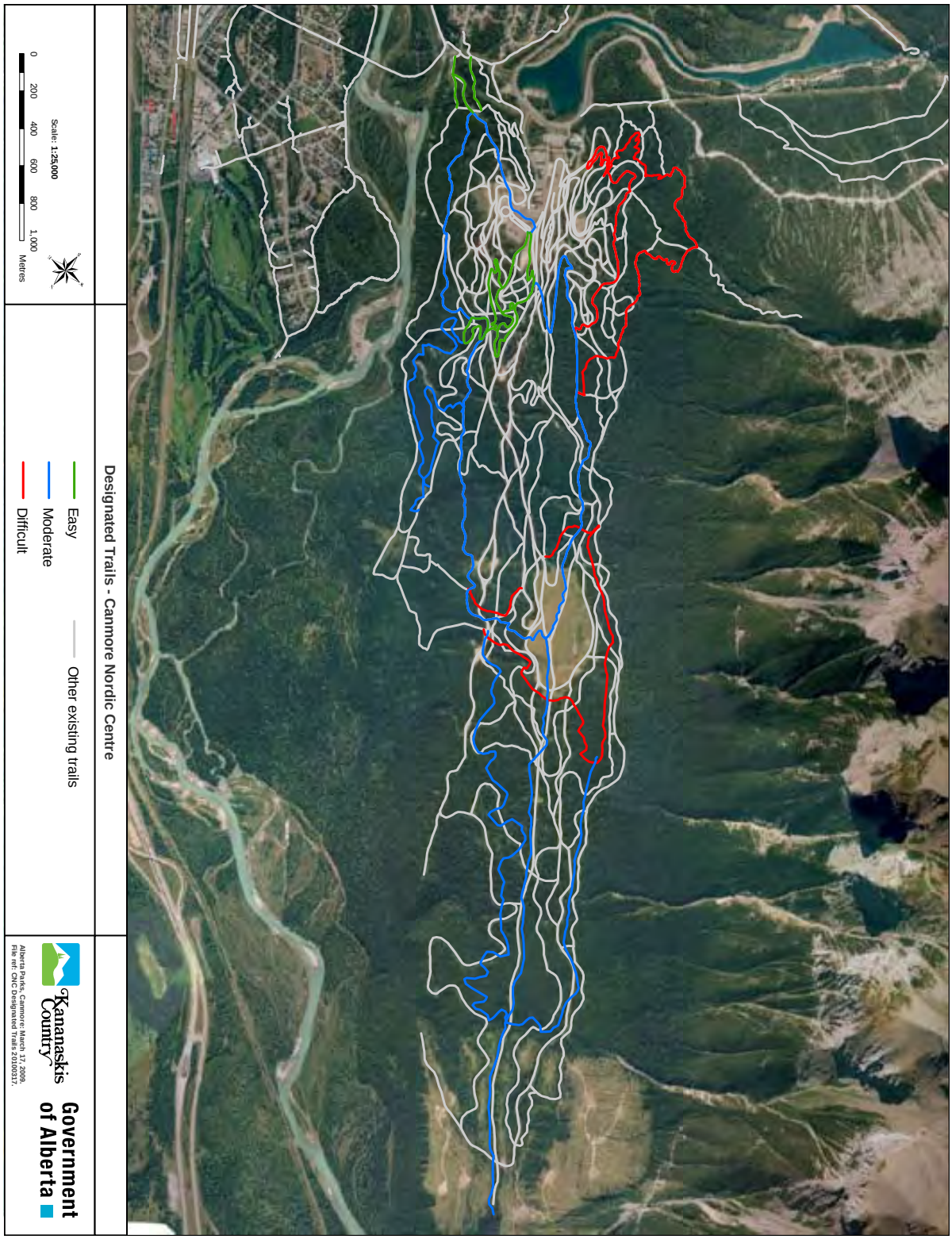
Trail Grade Average

	Less than 5%	5% or less	10% or less	15% or less	20% or more

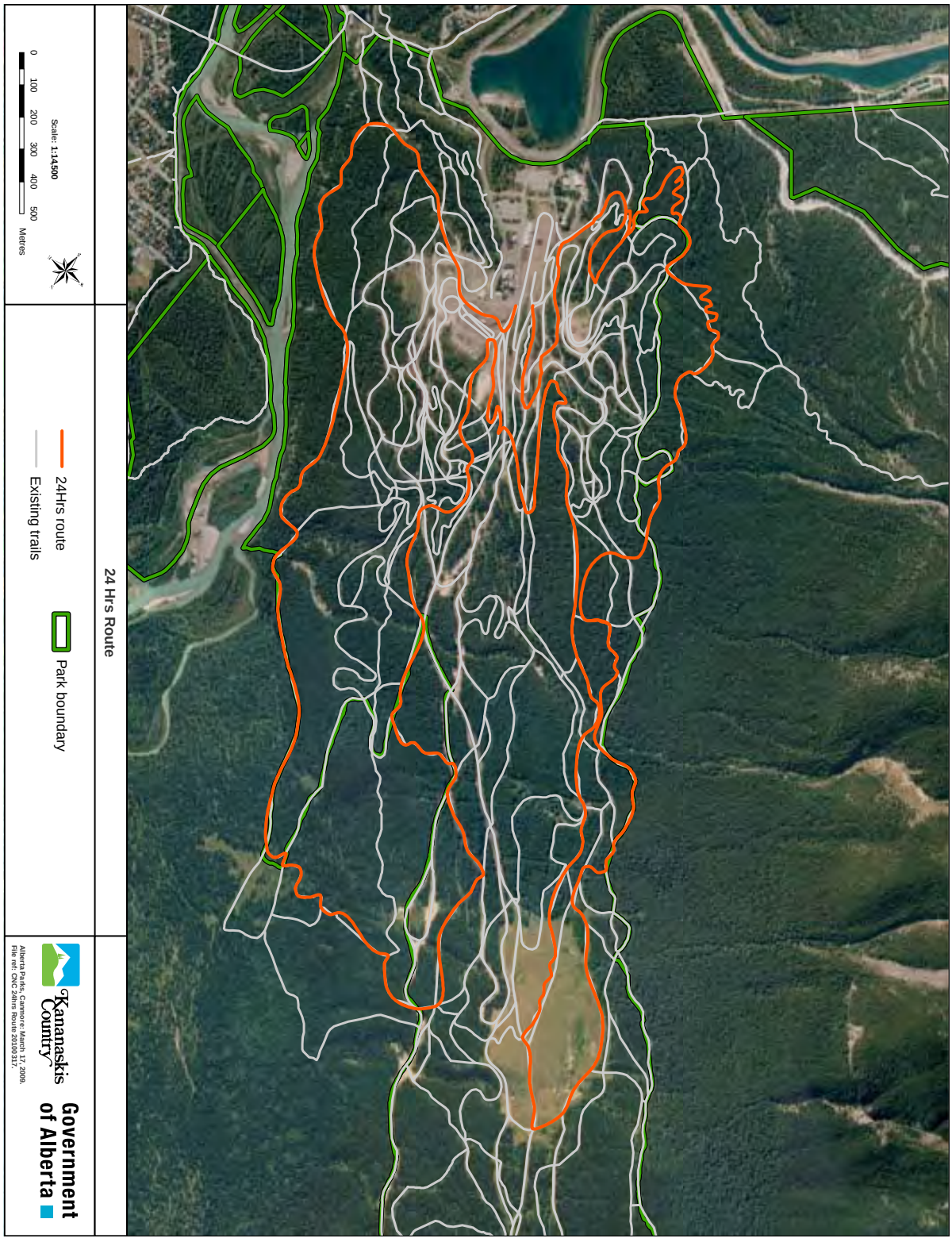
Trail Grade Max

	Max 10%	Max 15%	Max 15% or greater	Max 15% or greater	Max 15% or greater

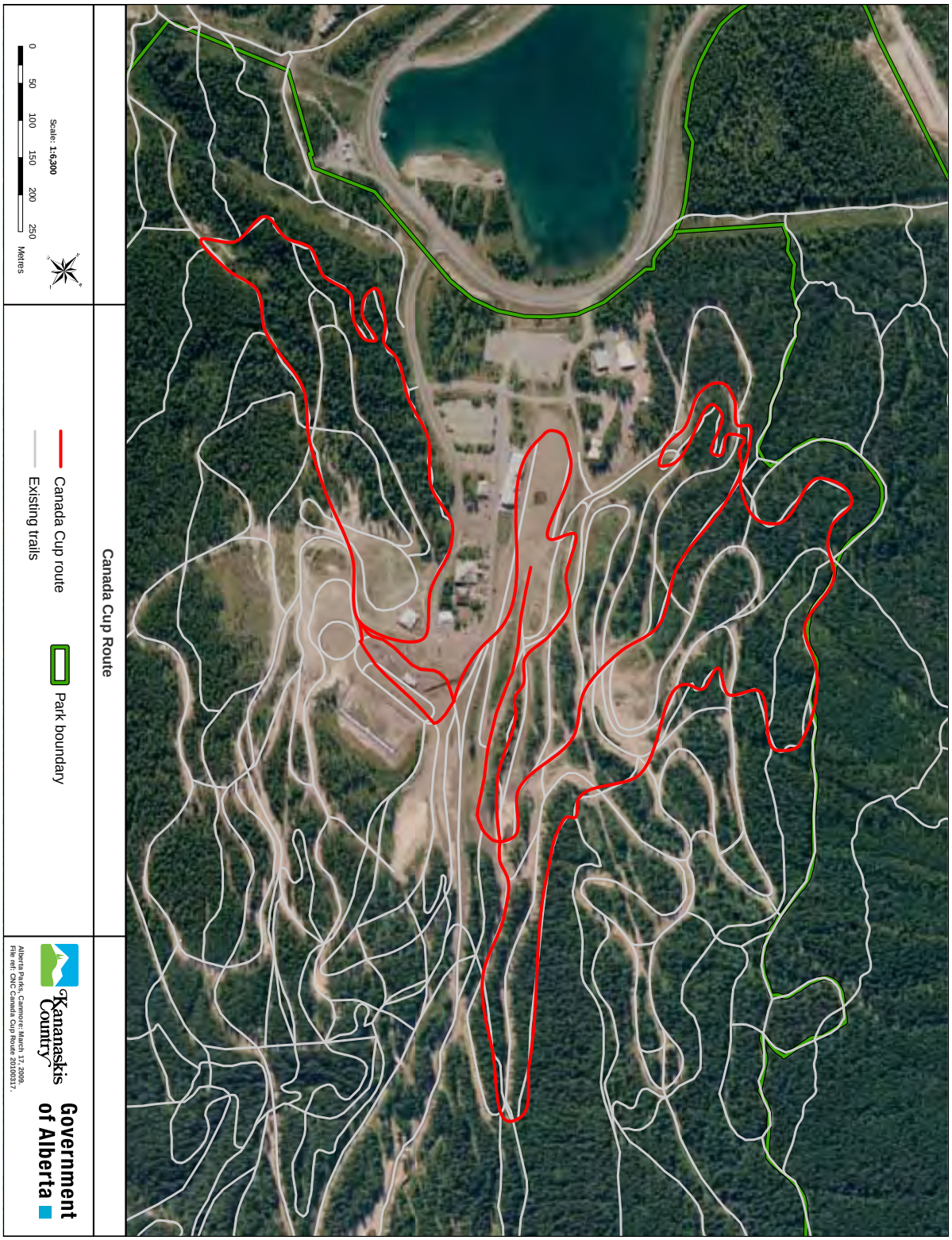
Appendix 8:
Designated Trail System Maps



Appendix 9:
24 Hours Event Loop



Appendix 10:
Canada Cup Event Loop



Appendix 11: Recommended Resources

Alberta Recreation Corridor & Trails Classification System. Government of Alberta, 2009. (http://tpr.alberta.ca/recreation/trails/classification.aspx) The classification system will be an important component of an Alberta Recreation Corridor and Trails Designation Program, providing a basic framework to assist in assessing trails, to assist trail groups with their planning, design and construction decisions, and to assist land managers with operational decisions.

Bow Valley Protected Areas Management Plan. Alberta Community Development (Parks and Protected Areas), 2002. (http://tpr.alberta.ca/parks/kananaskis/pdfs/BowValleyManagementPlan.pdf). This plan provides a descriptive assessment of the Canmore Nordic Centre Provincial Park and the bordering lands.

Conflicts on Multiple-Use Trails. Roger Moore. U.S. Federal Highway Administration, 1994. (www.fs.fed.us/cdt/carrying_capacity/conflicts_trails_synthesis_1994.pdf) This resource offers a comprehensive review of the research literature related to recreation conflict, and has served as an invaluable resource for trail managers, volunteers, and advocates for more than a decade.

Fromme Mountain Sustainable Trail Use and Classification Plan. District of North Vancouver, 2008 (http://www.dnv.org/article.asp?c=988) This document is a good example of system-wide trail master plan. It was created through a 5-year process, and formalizes a shared-vision for the trails on Fromme Mountain. The document includes assessment of each system trail to provide an overall vision, best practices for environmental sustainability, and provides trail guidelines for future trail projects.

Lightly on the Land: The Student Conservation Association Trail-Building and Maintenance Manual. Robert Birkby, SCA, 2005 (www.imba.com) Lightly on the Land focuses on crew leadership and the nuts and bolts of trail construction and maintenance. It contains detailed instructions on many technical skills such as building with rock, felling and buckling, building with timber, bridge construction, transplanting, and environmental restoration. Explains tools, tool repair, knots, and rigging. Instead of photos, it uses hundreds of fine illustrations to depict specialized techniques such as surveying, rigging, stonework, chainsaw skills, timber joinery, and bridge building.

Managing Mountain Biking: IMBA's Guide to Providing Great Riding. IMBA, 2007 (www.imba.com) Managing Mountain Biking offers a collection of best practices for planning, designing, and managing successful trail networks and bike parks. More than 50 experts—including land managers, recreation ecologists, professional trail builders, and experienced advocates—contributed to Managing Mountain Biking, creating a complete reference. Managing Mountain Biking details overcoming user conflict, minimizing environmental impact, managing risk, and providing technically challenging riding. While IMBA's 2004 book, Trail Solutions covers trail construction, Managing Mountain Biking focuses on solving mountain biking issues through innovative trail design, effective partnerships, and visitor management strategies.

Natural Surface Trails by Design: Physical and Human Design Essentials of Sustainable, Enjoyable Trails. Troy Scott Parker, 2007 (www.imba.com) This groundbreaking book explores trail design from a theoretical perspective, covering the physical and human forces and relationships that govern trails—how we perceive nature, how trails make us feel, how trail use changes trails, and how soils, trail materials, water, drainage, and erosion behave.

Plan for Parks. Government of Alberta, 2009. (http://tpr.alberta.ca/parks/p4p/) The Plan for Parks will help ensure the sustainability of our natural landscapes and enhance recreational opportunities for Albertans. The plan aligns with the province's Land-use Framework, and is playing a key role in achieving our objectives for responsible land use in Alberta.

Recreational Trail Study for British Columbia: Phase 1 – Background Report. Ministry of Tourism, Culture and the Arts, Ministry of Environment, and Province of British Columbia, 2007 (www.tsa.gov.bc.ca/sites_trails/docs/Provincial_Trails_Strategy/Trail_Strategy_Appendi x1_May23.pdf) The first phase of this multi-phased project is the creation of this background report. This document is a great reference for information on Canadian laws and rules related to trails, best trail management practices from across North America, and discussion on the overall benefits of trails. It also includes a comprehensive survey, and the results, to help create a vision for the provincial trail planning, potential funding sources, and a province-wide trail inventory.

Region 5 Mountain Bike Management Strategy: Situational Assessment and Implementation Toolbox. Garrett Villanueva. U.S. Forest Service, 2007. (http://www.fs.fed.us/r5/mountainbikes/) This management strategy and situational assessment characterizes existing mountain bike trail conditions and provides methods for management. This document is written specifically for Region 5 in California, but its format, as a toolbox provides trail management advice that can be applied in any trail system. It is also a good example of a system-wide master plan.

ROWG Report. (http://www.biosphereinstitute.org/docs/ROWG-final-draft-June-26-2002.pdf) The Bow Corridor Ecosystem Advisory Group (BCEAG) is a senior level advisory group formed to address development issues in the Bow Corridor. BCEAG's partnering agencies include the Town of Canmore, Municipal District of Bighorn, Provincial Government, Banff National Park and Town of Banff. Working in a multi-jurisdictional partnership, BCEAG prepares integrated recommendations for consideration by the member agencies. ROWG is a working group of BCEAG, and as such, reports directly to BCEAG.

Sea to Sky Corridor Recreation Trail Strategy. British Columbia, Ministry of Tourism, Culture and the Arts, 2007 (http://www.tsa.gov.bc.ca/sites_trails/Initiatives/SeatoSky- Strategy/sea_to_sky_strategy.htm) The Ministry of Tourism, Culture and the Arts (MTCA) developed this comprehensive strategy to provide guidance on the management of this regional trail system. The strategy provides a framework for legal authorization and establishment of the vast majority of previously unauthorized trails on Crown land, recommends a process and organizational structure for ensuring a Corridor-wide coordinated approach to management of the extensive trail network, identifies opportunities and actions required to ensure a sustainable and economically beneficial network, and outlines and recommends trail construction, maintenance and sign standards and guidelines. This document is a useful example of a regional trail master plan.

Appendix 11: Recommended Resources

Trail Construction and Maintenance Notebook. Woody Hesselbarth, Brian Vachowski, and Mary Ann Davies. U.S. Forest Service, 2007 (www.fhwa.dot.gov/environment/rectrails/trailpub.htm) This pocket-sized notebook is oriented to the needs of a trailworker. It pulls together basic trail construction and maintenance information in an easy-to-understand format. It includes a lot of the information detailed in Trail Solutions, plus a few additional strategies for trails in wet areas. It is concise with lots of illustrations – a perfect book to keep in a backpack out on the trail.

Trail Planning, Design, and Development Guidelines. Minnesota Department of Natural Resources, Trails and Waterways Division, 2007 (www.comm.media.state.mn.us/bookstore) This comprehensive guide to shared-use paved trails, natural surface trails, winter use trails and bikeways is an excellent reference, well organized with tabs and an easy to follow lay-out. The book features dozens of useful reference illustrations and pictures for each specific topic (i.e. 6 pictures of different types of water caused erosion). Some information is Minnesota specific, but most is relevant to all climates and situations.

Trail Solutions: IMBA's Guide to Building Sweet Singletrack. IMBA, 2004. (www.imba.com) This comprehensive trail building resource combines cutting-edge trail building techniques with proven fundamentals in an easy-to-read format. The book is divided into eight sections that follow the trail building process from beginning to end. Readers are guided through the essential steps of trail planning, design, tool selection, construction, and maintenance. Additionally, Trail Solutions provides detailed advice on banked turns, rock armoring, mechanized tools, freeriding, down hilling, risk management, and other pioneering techniques. Trail Solutions is an essential tool for land managers and volunteer trail builders aspiring to raise their shared-use trail systems to the next level.

Wetland Trail Design and Construction. U.S. Forest Service, 2007. (www.fhwa.dot.gov/environment/fspubs.) This manual describes common techniques for building a wetland trail. Starting with identifying the type of wetlands, this manual outlines how to build a dozen different types of wetland crossing structures (with and without foundations), what tools and materials to use, and instruction on maintaining drainage to minimize environmental impacts. This book is written for wetland trails, the techniques described can also be used for correcting other poorly drained low areas in existing trails.

Appendix 12:
Estimating Time and Cost of Building Trails

The following factors contribute to trail building time and cost.

Type of Trail

The trail style and the mix of anticipated trail users plays a fundamental role in trail building time and cost. The primary access trail in a trail system may need extensive construction work to achieve the necessary wide and smooth tread. On the other hand, a 1.0 meter wide, single track trail could be built with fewer resources.

Type of Terrain

Time and effort increase drastically as soil gets harder, roots and rocks increase, vegetation gets thicker, and the grade gets steeper.

Location of Trail

The proximity of the work site to vehicles, materials, tools, and trail workers will affect both cost and time.

Hand or Mechanized Tools

Mechanized tools can reduce construction time and cost. A three-person crew using a mini dozer can build 150 meters to 200 meters or more of finished trail per day. A three-person crew using only hand tools, by contrast, may only build 150 meters on a good day. The average labourer building a trail by hand earns $15 to $25 per hour, whereas the average trail builder using mechanized tools earns $30 to $60 (the higher rate reflects the skill involved in operating the machinery as well as machinery maintenance and transportation costs). Initially, it may appear that hand labourers are a comparative bargain. In most cases, however, machine-built trails are actually less expensive to construct, since mechanized tools significantly cut labour hours and the overall cost of the project.

Professional or Volunteer Labour

On average, one experienced pro using conventional hand tools can build 3 meters of bench cut trail per hour, or 25 meters per day. In steep, rocky, or heavily forested conditions, that average can drop to as little as 0.5 meters per hour or 4 meters of finished trail in a single day. If you use volunteers, construction costs are much lower, but the work takes much longer.

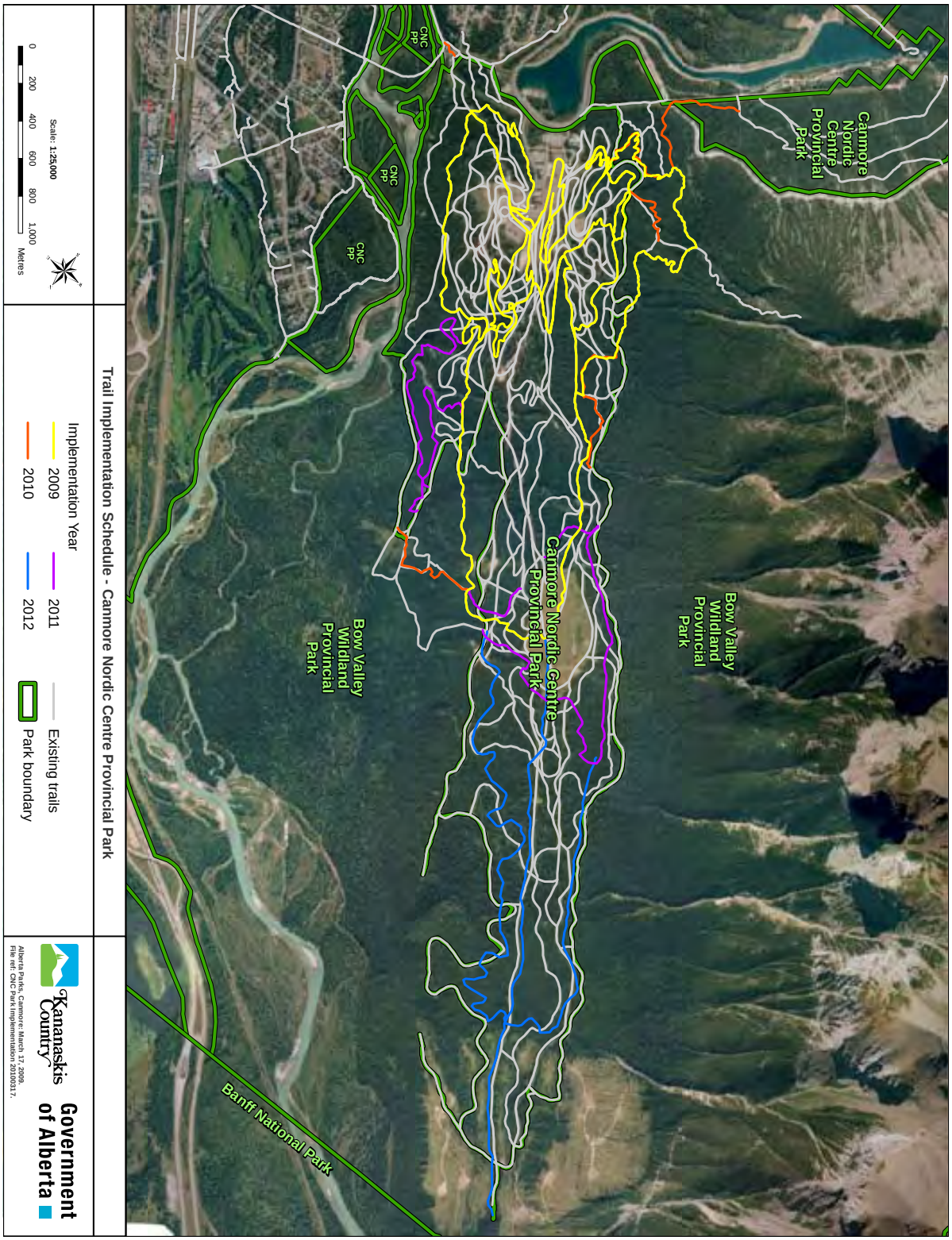
Trail Structures

Construction time and costs are also determined by the number of labour-intensive features on your trail. Switchbacks and bridges, for instance, will quickly raise the price of your project. Every switchback adds between $300 and $1,000, or 200 to 500 hours of volunteer time, and large-scale bridges can cost as much as $50,000 or even $80,000.

Here are some estimates gathered after polling several professional contractors early in 2004. If you are using all volunteer time, you can use these estimates to put a dollar value on the work.

PROJECT	COST
Trail Construction by Machine	Easy conditions: $5 permeter/$5,000 per kilometer Typical conditions: $10 per meter /$10,000 per kilometre Hard conditions: $20 per meter/$20,000 per kilometer
Trail Construction by Hand	Easy conditions: $5 per meter/$5,000 per kilometer Typical conditions: $15 per meter /$15,000 per kilometre Hard conditions: $30 per meter/$30,000 per kilometer
Switchback Construction	$300 to $1,000 per switchback
Wooden Bridge	$20 to $25 per square foot of decking
Metal Bridge	$50 and up per square foot of decking
Trailhead Facilities	Restrooms: $15,000 to $20,000 apiece Gravel Parking Lot: $15,000 to $25,000
Trailhead Kiosk	$2,000 to $3,000
Trail Markers	$5 to $20 apiece

Appendix 13:
Trail Construction



SUMMER MAP

Easiest Trails
AM - Alpine Meadows
CA - Canmore
CH - Callaghan
CR - Coal Road
GI - Georgetown Interpretive
NR - Narnia

Easy Trails
BA - Banff
BL - Banff Loop
CS - Cold Shoulder
GO - Get Out
GT - Get In
GW - Grey Wolf
LL - Lillehammer Loop
LY - Lynx
OR - Orchid
OS - Osprey
SC - Scootch Line
SW - Swamp
WB - Wooded Bliss
WA - Wax Test Loop

More Difficult Trails
AB - Albertville
AR - Artisitc Merit
BB - Baby Beluga
BC - Bruin Cub
BD - Backdoor
BO - Bow
CE - Centennial
CL - Coal Chutes
DC - Dipped Cone
EE - EKG East
EK - EKG
ES - Elevator shaft
FT - Frozen Thunder
FY - FYI
GC - Georgetown climb
HM - Hey McLeod
KB - Killer Bees
LC - Laundry Chutes
MJ - Matching Jerseys
MV - Meadowview
NG - Nagano
NH - No Homers
NN - Nector Noodle
SA - Sarajevo
SF - Sherwood Forest
SN - Snowshoe hare
S3 - Salt Lake 3.5 Cutoff
SY - Soft yogurt
TA - The Albertan
TS - Trail Sports
TT - Treasure Trail
ZG - Ziggy's

Very Difficult Trails
BR - Bruin
BU - Buried Alive
CG - Cougar
CL - Coal Chutes
CM - Chipmunk
CT - Coyote
DD - Devonial Drop
ED - Eye Dropper
FF - Freddie's Flip
FS - Flying Squirrel
KS - King of Sweden
LC - Laundry Chutes
MH - Mad Handler
NH - No Homers
OL - Olympic
OV - Oven
RL - Roller Coaster
RT - Rundle
SH - Shorty's chute
SL - Salt Lake
ST - Silvertip
TT - The Terminator
WO - Wolverine
WP - Wapiti

Trail Type
Single Track
Double Track
Groomed Ski
Construction 2010/2012
Paved Trail
Roadways
Competition Trail

Trail Difficulty
Easiest
Easy
More Difficult
Very Difficult

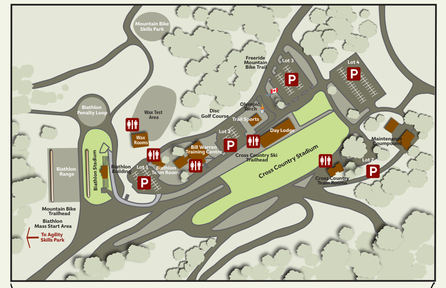
Junction Numbers
Summer
Winter

Map Symbols
Bridge
Viewpoint
Disc Golf Course
Mountain Bike Skills Park

Trail Loops
Easy Loop
More Difficult Loop
More Difficult Loop
Very Difficult Loop

*Intermediate Event Loop
*Very Difficult Event Loop

**Ask at Information Counter in Day Lodge for Maps*



Canmore Nordic Centre Provincial Park