

# 1.0 Introduction and Background

The Haliburton Highlands Trails and Tours Network (HHTTN) is an organization dedicated to the development and promotion of trails and tours in Haliburton County. The mission of the Network is to develop Haliburton County as a premiere trails and tours destination. Its goals are to provide quality recreational trail and tour opportunities, enhance the local economy, protect the health and beauty natural environment, promote healthy lifestyles and foster community pride and participation.

HHTTN is an incorporated not-for-profit organization that represents all trail interests including trail organizations, managers and owners and community organizations. Organizations represented on a Board of Directors include: the Haliburton County Snowmobile Association Haliburton, Nordic Trails Association, Haliburton Highlands Cross Country Ski Club, Ski Friends of the Frost Centre Haliburton Easy Ryders Cycling Club Haliburton Association for Recreational Canoeists, Haliburton Highlands Horseman's Association, Haliburton Highlands Chamber of Commerce, Haliburton Highlands Stewardship Council, Outdoor Centres of Haliburton Highlands, Kawartha, Haliburton, Pine Ridge District Health Unit, Haliburton County Bed and Breakfast Association, and County of Haliburton. Trail owners and managers within the county include provincial government, municipalities, resorts and lodges, landowners, educational institutions, camps, outdoor centres, and other community organizations.

The Haliburton Highlands Trails and Tours Network works with trail and community organizations and trail owners and managers to

- promote and market all trails and tours in Haliburton;
- facilitate and integrate trail development and marketing of trails and tours;
- improve the quality and quantity of trails in the area; and
- share information and resolve trail and tour related issues.

It has been well documented that tourism trends over the last decade have resulted in increased resident and visitor demand for outdoor activities that typically take place on trails. It has also been shown that when trails responding to these demands are well designed, managed and marketed to high standards, the resulting economic impacts for the communities where these trails are located can be very, very significant. Bearing this in mind the HHTTN understands the need to develop trail signing and infrastructure guidelines to assist local trail owners and managers, such as trail organizations, local government, volunteers and the private sector, upgrade existing and develop future trails to a reasonably high, consistent standard. The intent is to provide guidance to these trail development partners in the creation of a county-wide trail network that is easily identifiable and consistent in design and quality.

Ontario has experienced tremendous growth in trail use and development. Over the past twenty-five years volunteer groups, conservation authorities and municipalities have taken the lead to provide trail corridors for their communities. The Trans Canada Trail (TCT) alone will offer more than 3,500 kilometres of seamless community trails acting as the 'backbone' of a provincial trail network, when it is completed. The TCT will link northern and southern Ontario, providing a range of landscapes for hiking, cross country skiing, snowmobiling, equestrian use and cycling on sections of the world's longest trail. Thirty-two years of organized snowmobiling has resulted in the development of over 49,500 kilometres of snowmobile trails across Ontario—a distance longer than the provincial road system. The Bruce Trail, Waterfront Trail, Ganaraska Forest Trails, Rideau Trail, Oakridges Moraine Trail, Voyageur Trail, Rainbow Routes, Huronia Trails & Greenways, Eastern Ontario Trails Alliance and Discovery Routes among many others are all a testament to the growth and momentum in trail building and use.

Canadian trends follow suit. Current Canadian research indicates that people are taking shorter but more frequent vacations closer to home. Walking, cycling, and jogging are among the top ten most

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popular recreational activities of Canadians and all trail activities are experiencing substantial annual growth in participation rates. Health professionals are placing a renewed focus on the pursuit of trail activities and seniors groups are forming to participate in a range of trail activities for their social and fitness benefits.

## 2.0 Purpose of a Trail Development Template

Creating a high quality trail system that serves both local residents and that attracts tourists requires many key ingredients, one of the most important of which is a unified approach to design issues. For this reason, part of the solution involves creating a trail “template” to insure that all trails in the County are constructed and maintained to high quality and consistent guidelines. This template is also needed to identify and promote distinctive, high quality trail infrastructure and recognizable signing suggestions. Consistent and identifiable standards benefit both the trail user who is familiar with the HHTTN trail network as well as the first-time user. A positive first-time experience will keep trail users coming back time after time.

Much has been documented about trail construction in Ontario. Many different organizations have developed their own trail designs, some based on accepted standards, some based on trial and error. The information presented in this trail development template is intended as a guide to aid trail development groups, both public and private. Information contained in this document can be helpful in preparing trail development proposals, estimating trail development costs preparing basic site plans and designs as well as maintaining trails to a consistent, high standard. It may also be useful in developing fundraising strategies and for demonstrating Haliburton County’s commitment to high quality trails.

The information in this document contains a compilation of design standards for multi-use and single-track trails across Ontario. It provides a summary of best design practices and covers all facets of trail design from materials used in the trail bed to trailside amenities and access, to trail signing systems. The details provided in this document are typical in nature, and describe the important elements of design and their spatial organization. However, it must be recognized by all users of this manual that these typical details must be adapted to each particular site. Each piece of each trail has its own unique characteristics that need to be studied carefully so that the elements of each of the typical design details can be effectively applied. Although many situations typically encountered during trail development and construction can be resolved using techniques described in this template, there are many situations that seem simple yet are actually quite complicated. A good trail manager/trail organization should know when it is appropriate to enlist the services of a professional trail design expert. The following are a few examples of when a trail design expert should be consulted:

- When a number of seemingly divergent trail user groups have an interest in developing trails along the same corridor or same general area,
- Where adjacent landowners have voiced serious concerns about trail use and these concerns can not be easily overcome,
- Where complex design issues need to be addressed. Some of these might include the combination of motorized and non-motorized trail uses, complex trail intersections, trail crossings of major roadways, the design of trailside amenities such as signs, information kiosks, structures such as bridges, retaining walls and stabilization of slopes.

If you are in doubt, consult a professional trail design expert. He/she can provide an appropriate solution based on experience with best practices elsewhere, or they can provide you with contacts for the unique situation you are trying to resolve.

The typical details presented in this document have been grouped into the following areas:

- Trail construction and maintenance,
- Trail layout,
- Trail access,
- Road crossings,

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- Trail signing, and
- Special single-track trail treatments.

Finally, it is important to note that this manual is a first edition. Additions or improvements to the manual will become part of future editions to this manual. The authors would appreciate your comments and suggestions for improvements to this template.

## 3.0 Trail Development Process

A number of steps should be followed as part of the process to properly develop a trail system. It is important to follow the steps in sequence and it should be noted that some of the steps are iterative. Trail volunteers are often capable of conducting some of the steps in the process, while some require the assistance of trail development professionals. A good trail manager should know when professional help is required and should not be afraid to seek it. Following the process ensures a sound decision making process that has been tested at critical points in time, and that will lay the foundation for a properly designed and managed system.. Figure A provides a graphic outline of a typical trail development process, and each of the major steps is described in more detail below.

### 3.1 Identify Need

Developing a trail system typically begins when one or more of the following situation arises:

- community group(s) identify a need for a formalized trail system as a means of satisfying recreational needs,
- private land owners adjacent to trails on public lands cite concern regarding informal/unauthorized trail use on their lands,
- an opportunity arises in a community through the acquisition/donation/agreement to use lands suitable for trail development (these may include public or private lands -where invited, and/or
- an existing trail system is experiencing a significant increase in use, either due numbers of users or an increase in the number of user groups.

Once the need or opportunity has been identified, a number of steps should be followed.

### 3.2. Trail User Profiles

Different user groups require/enjoy different types of trails, and not all trails are suitable for all user groups in all places throughout the network. An important first step in trail design is to understand who will be using the trails; therefore, who the trails are being designed for. Depending on location, certain trail users may not be likely to use the trail, and it may not be desirable to invite all trail user groups to use certain sections of the trail. For example, it is very unlikely that trails in remote rural areas need to be designed to accommodate wheelchair use. It may also be desirable to discourage or prohibit certain trail user groups from some areas. Examples might include local bylaws that prohibit the operation of some motorized uses within town or village boundaries, and environmental sustainability of trails in sensitive natural environments may warrant a limitation to pedestrian traffic only.

Users of Haliburton County trails consist of the following groups:

#### **Walkers/Hikers/Snowshoers**

Walkers and hikers tend to be year-round trail users and seek trails in both built-up, rural and wilderness areas. A significant proportion of hiking activity tends to be concentrated within and between neighbouring built-up areas, and near staging areas. This recreational hiker typically prefers a short duration walk of less than an hour up to about 4 hours. Of this group, a significant number fall into the less than one hour category. They typically seek trails with destination(s) and/or stopping points along the way. The long distance hiker is another significant group. They prefer longer hikes often several days in length and prefer more of a “wilderness” experience. A typical day hike for a long distance hiker ranges from 10 to 25 kilometres depending on the level of difficulty of the terrain and distance between destination points such as scenic lookouts. Although a looped route is not a critical factor for this group when deciding upon a route, it is still important to provide trails with variety in scenery, topography and resting points. Interpretation of natural and cultural history is often an important selection criterion applied by the recreational and long distance hiker. Therefore designing

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trails with unique naturally and culturally significant destinations adds an important dimension to a trail network. As a group, hikers are less likely to be attracted to long stretches of abandoned railway corridors.

Although the majority are day hikers, some snowshoers combine snowshoeing with winter camping or inn to inn hiking. Trail route length and character are quite similar to those for hikers. An obvious and significant difference is that snowshoers have the ability to cross frozen wetlands, watercourses and lakes provided that ice thicknesses are sufficient. They prefer deeper snow and tend to avoid high traffic areas heavily traveled trails where snow is packed.

## **Cross-country Skiers**

The majority of cross-country skiers tend to prefer destination areas that cater specifically to their activity. These range from conservation areas with marked trails to track set destinations that are dedicated to high performance training and racing designed for track skiing and skating. Due to the rugged terrain throughout much of Haliburton County, many of the cross-country ski trails are rated intermediate to difficult. It is important to consider the less experienced, less athletic skier when planning and designing ski trails in Haliburton. Some examples of cross-country ski destinations in Haliburton County include Pinestone area trails, Moosewoods, the Frost Centre and Glebe Park.

Abandoned rail corridors may be popular with nearby residents and visitors for cross-country skiing. The long flat trails will attract both beginner skiers out for some fresh air as well as athletic skiers out for an aerobic workout. The highest level of activity will most likely occur between built-up areas, near staging areas and adjacent country lots. For many sections of these corridors, separate trails could be constructed to reduce conflicts with motorized vehicles.

## **Other Wheeled Users**

Rollerblades and wheelchair users should be considered as users of the trail network. These uses most often occur within and between built-up areas and staging areas. This group is much less likely to use remote rural trails, although the provision of wheelchair accessible trails in unique natural and cultural areas should be evaluated during the design process. Asphalt surfaces and boardwalks can be used by this group, whereas granular and natural surfaced are often a barrier, excluding this group. It is critical to consider accessibility to all parts of the trail including but not limited to staging areas, washrooms and interpretive facilities wherever wheelchair access is being considered, and consulting an expert on barrier free design is a prudent decision.

## **Snowmobilers**

Presently, snowmobilers are among the most numerous trail users on the HHTTN (numbers and revenue generation), and will likely to continue to be for the foreseeable future. Capable of traveling long distances, snowmobilers often plan their trail routes around a number of destinations in a single outing. They are attracted to trails that cover vast geographic areas. It is not uncommon for snowmobilers to travel over 100km in a single outing. Snowmobile club and OFSC members have access to their network of trails through the access agreements negotiated with private landowners as well as public trails where it is appropriate. While some of the traditional snowmobile routes will not be accessible to other user groups due to seasonal exclusions (e.g. trails over lakes) and agreements with private landowners, the use of some snowmobile trails for other uses such as ATV, cycling and equestrian use should be considered. The Motorized Snow Vehicles Act governs the use of snowmobiles in Ontario, and should be consulted as part of the trail design process. The OFSC has experienced snowmobilers on staff who are able to interpret the Motorized Snow Vehicles Act and who have significant experience when it comes to designing and maintaining snowmobile trails, as well as managing snowmobile clubs.

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## **Off Roaders (ATV's, 4 x 4's ("4 Wheelers"),Dirt Bikes and other Motorized Uses)**

An increasingly popular trail user group, Off Roaders should be considered, provided that community concerns about compatibility, impacts on trail surface, and the presence of an organized club or association or other acceptable organizational structure can be resolved. Every effort should be made to educate all trail users, Off Roder enthusiasts, and landowners about this activity and the benefits it can provide in the proper location.

Generally, this group prefers trails in a natural and rough state. Obstacles on the trail such as small deadfalls, rock outcroppings and potholes are welcome challenges. Trails with rough conditions and numerous obstacles may actually be safer as they force vehicles to "crawl" as operators negotiate the difficult terrain. Many vehicles are equipped with lockers that allow the operator to lock the differential in order to cross large obstacles that may force more than one wheel off the ground simultaneously. Almost all Off Roaders carry topography maps while on the trail. Some units are equipped with GPS units to aid in navigation.

Off Roaders generally do not cover as much trail in a day's outing as a snowmobiler might. For example, a day's outing for a 4 Wheeler might be 40km and 80 to 100km excursion for an ATV. Looped trail or maze trail systems are preferred in favour of those that dead end. Speed on the trail varies depending on terrain with averages being of 10-15km/hr for a 4 Wheeler and 30 to 50km for other motorized off road trail users.

Haliburton County has an extensive network of abandoned logging access roads that are well suited to Off Roder operators. Generally little preparation of these trails is required apart from keeping trails from growing over and creating occasional designated bypass routes around the most challenging obstacles. Signage, including the installation and maintenance of trail markers is an important consideration.

Education of Off Roder operators is an important component of motorized off road trail use. Some important messages include:

- Stay on the trails, don't cut new trails to avoid obstacles,
- "Winch or strap" to traverse challenging obstacles, do not dig,
- Winch only with an approved tree strap do not use other objects such as chains or cables
- Do not remove obstacles or cut trees,
- If you need to alter this trail to traverse a challenging obstacle, you should consider a trail with a lower level of difficulty, and
- Pack out what you pack in.

Some of the potential problems caused by users lack of awareness of trail condition can be averted by posting trail difficulty rating at trail access points and staging areas.

Generally, very few amenities are required at staging areas for Off Roaders. Most vehicles arrive under their own power and only require some space to pull off and partially deflate tires prior to embarking on the trail. For those users arriving with equipment on trailers, parking for tow vehicles and trailers is required as a minimum.

## **Cyclists**

Another increasingly popular user group, that will likely become more visible with time throughout the HHTTN, this group will consists of those who are comfortable with both on- and off-road riding. They use their bicycles for transportation (commuting) and recreation. Since cyclists can cover relatively long distances for both recreation and commuter uses, they should be considered as a user potential user

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group on virtually all trails with the exception of those that may be prohibitive from the point of view of environmental sensitivity.

Cyclists can generally be categorized into 3 groups:

- **Road Cyclists:** The fastest form of cycling, road bikes have narrow tires inflated to high pressure in order to reduce rolling resistance. This group requires hard surfaced routes and is typically confined to asphalt roadways and asphalt multi-use trails. In Haliburton County, this group of cyclists can be accommodated on dedicated bike lanes, paved shoulders on busier roads and highways as well as signed routes on quiet rural roads. The touring cyclist is part of this group.
- **Mountain Cyclists:** Also referred to as off road or cross-country cyclists, this group uses a much sturdier bicycle with wider, more heavily treaded tires. Mountain cyclists ride on a range of facilities from multi-use trails to logging roads and single track trails. They often prefer single track trails, which can be narrow, earth or rocky surfaced trails with plenty of obstacles. Grades on single track trails can be very steep. Because of these steep grades, single track trails can be subject to erosion. Regular maintenance and monitoring is required to keep this type of trail in the best possible condition. Mountain cycling has been steadily increasing in popularity since its introduction in the early 1980's. Since that time mountain cycling centres that cater specifically to the variety of skill levels within the mountain cycling group have been developed across the province and throughout North America to the point where destination oriented mountain cycling is a significant form of tourism. Resorts that specialize in cross-country and downhill skiing during winter months are often ideal candidates for mountain cycling during the spring, summer and fall months.
- **Hybrid Cyclists:** This group lies between the Road and Mountain cyclists and as the name suggests, bicycles are often a cross between the road bike and the mountain bike. This type of rider is most likely to be attracted to urban multi-use trails and streets, rail trails and single track trails with a low to moderate level of skill required.

As cyclists might use the road for their entire route, or as a link in their off-road route, the development of on-road bicycle routes should be considered. Bicycles are considered as a vehicle under the Highway Traffic Act and as such are expected to obey the "rules of the road". Furthermore, the Transportation Association of Canada (TAC) has developed a nation-wide set of design and signing standards (Bikeway Traffic Control Guidelines for Canada, 1998), which should be consulted when designing on-road cycling routes. Some of the key design details for this user group is provided in this template.

The topography, scenery and facilities in Haliburton County and throughout the HHTTN are well suited to take advantage of the popularity cycling in various forms has been enjoying in recent years.

## **Equestrian Riders**

Equestrian riding has been steadily gaining popularity over the past several years and is expected continue to do so in the future. As such, individuals, members of riding clubs and schools should have access to the appropriate segments of the network. Local by-laws may prohibit access to town or village trails by equestrians. Typically equestrians will travel short to moderate distances (5 to 40km for a day trip), typically preferring a loop route. Staging areas that accommodate the equestrians should be strategically located throughout the network and contain ample parking/loading space for vehicles with trailers, and tie bars to tether horses to during tacking up. There is an increasing trend towards destination travel (e.g. Inn to Inn travel) over longer distances.

## **Canoeists/Kayakers**

Haliburton County boasts an extensive network of lakes interconnected by stream, river or portage for canoe trips of varying lengths. The Network regards waterways and portages as trails. Canoeists and kayakers also use other trails to gain access to canoe routes. One important consideration for developing canoe access is to ensure that they are relatively close to trail staging areas where other

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amenities are available. Use of area canoe routes is on the increase creating significant environmental damage and user conflicts.

## **Dogsledding**

Dog sledding is increasing in popularity. The Minden Technical Challenge Sled Dog Derby was a popular event for many years. Local facilities and sled dog operators are catering to tourists offering one hour to two-day excursions. Amateurs and hobbyists are looking for trails to run their dogs on. Currently, there is a shortage of suitable trails for dogsledding as most winter trails are dedicated to snowmobiling and skiing.

## **3.3 Inventory and Analysis**

A thorough inventory and analysis of the trail(s) must be completed. The inventory should document existing conditions, trail opportunities and constraints. A useful technique is to develop a trail inventory checklist so that personnel conducting the inventory are sure to make all necessary observations and record all pertinent data. In cases where major road crossings or trail structures are encountered, the input of a professional trail designer should be considered (e.g. specialist Landscape Architect or Professional Engineer)

Developing and a detailed analysis of existing conditions, potential opportunities and constraints that need to be overcome is necessary prior to proceeding to the Public Input stage. The trail managers/designers should also be prepared to discuss trail development principles and potential design strategies with the public during the Public Input Stage.

## **3.4 Public Input**

Reviewing trail development initiatives, trail development principles, design opportunities and constraints and potential solutions with the public is critical at the onset of the project. It is important to make sure that those with an interest in the development of the trail (for or against) are brought into the development process as opposed to having a final decision and product thrust upon them. Consultation early on in the process is critical in generating interest, resolving issues and concerns as well as gaining support of interested individuals and organizations.

As with all trail development projects, there are issues, concerns and opportunities that are common as well as those that are unique to the individual situation. A short list of these is provided below. Professional Facilitators with a specialty in trail development are an excellent resource and can help to steer your organization in the right direction.

## **3.5 Trail Design and Implementation Strategies**

Trail design is an iterative process that begins with development of the ideas, examination of alternatives, refinement of the ideas and testing of the ideas. As part of the design process many obstacles will need to be addressed. Section 4 of this manual provides a broad cross section of typical design details that need to be dealt with during the design process for any trail system. Although this set of methods and techniques is not intended to be inclusive of all situations that may be encountered, it does address the broad range of design development details that are commonly encountered during the development of any trail.

Preparation of detailed cost estimates for construction is necessary in order to assign priorities to construction projects and to provide information for construction budgeting, and to approach potential

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partners to build the trail. Section 5 of this manual provides some insight into trail development costs and is a useful tool for preparing construction cost estimates.

## **Partnership and Funding Strategies**

In addition to capital works funds budgeted by the Municipal governments or other Authorities for the construction of the trail, a variety of funding resources and methods are available for the implementation of the trail plan. It has been the experience of the study team that the availability of funding for the construction of trail projects is likely at its highest level ever, due in part to the enormous popularity of trails today.

Some of the other currently available sources of support typically available for trail projects include:

**Superbuild Fund:** A government funding program that has been announced recently, this program provides dollars for infrastructure-related projects that are aimed at strengthening and diversifying local economies.

**Ministry of Natural Resources Community Fisheries and Wildlife Involvement Program:** A program that has recently funded a variety of habitat development projects associated with or nearby trails.

**Ontario Trillium Foundation:** This funding program was recently expanded considerably in response to the money collected by the province through the casinos.

**Go for Green TrailPAQ Program:** This program has funded trail projects that demonstrate collaboration between groups and municipal organizations that emphasize non-motorized trail activities.

**Charitable Foundations:** Existing or established for the purpose of trail works, this type of funding is typically available to registered charitable foundations. If a not for profit management group was established for the HHTTN (see Section 6), this broad group of funds may become accessible.

Some applicable examples include:

- The Allstate Foundation of Canada for educational programs related to delivering education programs on the environment;
- Canadian Wildlife Foundation supports scientific or other research projects related to conservation and environmental education;
- The Charles Ivey Foundation, which offers subsidies for educational and environmental projects
- The Chawkers Foundation, which provides assistance for educational projects on the environment; and
- Wildlife Habitat Canada, which supports conservation initiatives across Canada.

**Corporate Environmental Funds:** Typically these funding sources are heavily used and chances are low for large sums. They tend to fund small, labour-intensive projects where materials or logistical support is needed.

Some examples include:

- Canada Trust Corporate Contribution Funds such as the Friends of the Environment Community Fund, the Canada Fund and the Special Projects Fund, all aimed at projects that make contributions to environmental, intellectual or emotional health of communities.
- Mountain Equipment Co-op, which provides funding for environmental advocacy and education projects
- Shell Environment Fund, which funds action-oriented projects to improve the Canadian environment

**Corporate Donations:** Many corporations both large and small have made commitments to trails over the past several years. Donations may be in the form of cash or materials/services in kind. For example, various aggregate producers in the Caledon area have made contributions of granular base

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material and machine/operator time in return for public recognition of their efforts. Manulife, a Waterloo based firm contributed \$500,000.00 to a fairly small but significant trail in Uptown Waterloo.

The key selling features are corporate visibility (free advertising) and tax write-offs. Typically, these contributors require a comprehensive marketing program and presentations.

**Service Clubs:** Groups such as Lions, Rotary, Optimists, etc. have contributed cash, labour and materials to community trail projects with a high degree of visibility within the community level. In Grand Bend for example the local Rotary Club built an entire trail.

The Environmental Youth Corps: A program that provides financial assistance for wages and equipment for projects related to habitat improvement

### **Other possibilities include trails built:**

- in conjunction with other Agencies,
- via servicing agreements,
- by volunteers,
- with bequests, and
- individual sponsorship, of metres of trail or individual amenities such as benches and signs. This has proven successful at the local level once enthusiasm for the project begins to grow.

## 3.6 Trail Management

Trail interests in the HHTTN need one voice to speak:

- on behalf of all trail users and uses within the Haliburton Highlands;
- to influence land managers and decision makers; and

The leadership of the trail movement within the HHTTN needs to be formalized and ratified by local trail organizations and trail supporters.

To overcome the temporary difficulties that new trails or trail conversions may create with the surrounding communities, trail managers and trail management organizations should be familiar with the issues as well as the possible method(s) of dealing with these as offered in the discussion that follows.

### **Land Ownership and Trail Management**

Trail concerns are often raised due to feared incidences in vandalism, littering and easy access for burglaries where trailways were adjacent to private property. Part of the challenge is to forge mutually complimentary management agreements with landowners, including public landowners. This will be dependant on establishing good working relationships. One-to-one and on-going landowner relations are a very important component of the management plan.

### **Liability and Risk Management**

Landowner concerns are generally covered under the broad heading of risk management. Whether the trail owner is a municipality, a conservation authority or a trail management group, risk management must be addressed in a proactive manner. Adjacent landowners share many of the same concerns as the trail owner. What third party liability will be incurred if I own or manage a section of public trail and a trail user hurts themselves? What is the liability of the adjacent landowner if a public trail is their neighbour? These are both common questions raised by adjacent landowners.

The experience in Ontario is that individuals will always have the ability to sue for damages incurred on a trail. Whether or not they are successful comes down to the design and implementation of an effective risk management strategy.

Risk management is generally covered under the headings of insurance, safety, education, inspection and records management. Issues of liability are addressed in Ontario largely under the authority of the

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Municipal Act, for municipal lands, the Occupiers Liability Relief Act for public and private lands and the Highway Traffic Act and the Ontario Public Transportation and Highway Improvement Act for provincial highways. All trail management groups should become familiar with this legislation. In addition, the Trespass to Property Act deals with illegal access to private lands.

Most provincial trail organizations have worked with the insurance industry and developed policies for their member clubs and organizations. At this time insurance coverage is available to snowmobile clubs that are members of the Ontario Federation of Snowmobile Clubs and groups and organizations that hold membership with the Ontario Trails Council (OTC). The OTC comprehensive insurance package was developed in direct response to liability issues surrounding trails. The policy covers officers and directors of local trail management groups, the trailway itself (structures, trail surface, amenities etc.) trail users, and there are provisions for adjacent landowners. It is now possible to offer comfort to adjacent landowners that they will not be exposed to liability (any more than they already are as owners of land) by being adjacent or near to the trailway system. Other trail organizations also offer liability coverage to their members.

Many municipalities and conservation authorities cover their trailways as extensions of their park and conservation lands systems. Coverage varies, but in most cases premiums have not been increased with the addition of the trailway.

Some municipalities, thanks to the efforts of the “Adopt a Road” program, carry third party liability coverage for groups and individuals who volunteer to clean up sections of highway. This same policy could be extended to cover trail volunteers working on trails within the road allowance. This avenue should be investigated. Safety training should be a part of any such program.

## **Trail User Conflicts**

Good design and trail management can go a long way to resolve trail user conflicts, however some trail uses may need to be separated from each other, either within the same corridor, or in different corridors, or separated from a sensitive location. There are examples of trail systems where the same corridor is used by different groups during different seasons and even different uses on designated days of the week. Some trail corridors are wide enough to accommodate several uses and other trails should be designated for a single high quality experience. In the end, it is the community that should determine the most appropriate and compatible uses.

Where a decision has been made to allow simultaneous multiple uses on the same trail, or within the same corridor, some simple rules of courtesy should be followed. Figure B is a sample of the widely accepted trail courtesy yield sign. This “rule” among others must be established and communicated by the trail management organization so that all trail users clearly understand their privileges and obligations while using the trail.

## **Trail Inspection, Maintenance and Records Management**

Reasonable care must be taken to ensure that trailways are free from danger. Regular inspection and records showing the dates of inspection, the state of the trailway, hazards, required repairs or remedies and the actions taken to correct the hazards should be pursued and the records maintained. The frequency and method of inspection will be determined on an individual basis (see section 3.7).

## **Enforcement**

Use of trails has been found to be the best way to enforce trail rules. Properly designed and managed trailways are, to a large extent, self-policing. They attract certain types of users who are generally very respectful, not only of other users, but of private property as well. Some trail groups, such as the snowmobilers, have developed a warden or ranger system to patrol trails. Other groups and municipalities employ volunteers or paid staff who are trained to know how to handle situations and simply speak with trail users or call in complaints to trained personnel. Depending on the location of particular trails, the police and conservation officers have taken on an enforcement role.

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## **Safety**

User safety is likely the highest priority for most trail network master plans and is closely connected to an education strategy and trail design standards. It also involves a comprehensive understanding of user needs and expectations balanced with the most appropriate design details and support mechanisms to create as safe a system as possible. This is of particular importance when a variety of users all rely on the same facilities as in a shared use trail. Signage is one of the key ways to address the issue of risk management. Signs should identify designated uses, directions and warnings of potential hazards. A trail inspection program and schedule should be developed and implemented. The focus of the program is to identify hazards and correct them or at least post them as a hazard during the period it takes to rectify the problem.

Haliburton County is in the process of developing a “911” system of identifying roadways and private properties. The addition of 911 identification numbers to trails, trailheads and other related facilities is being contemplated as a logical extension of this system. When trails are being planned, managers should contact the 911 administrator(s) in each of the municipalities that their trail passes through in order to receive up to date information regarding 911 policies.

## **Educational and Interpretive Opportunities**

Interpretive programs and signs, either self guided or as part of a wider natural heritage education program, offer endless opportunities to raise awareness about the privilege of using trails. More importantly, the need to educate users about their obligations as responsible trails enthusiasts needs to be an integral part of developing the network management plan. Posting “No Trespassing” and “Pack your garbage out” signs are valuable educational messages for the trail users as well as good for building positive neighbour relations. Trail maps and guides should include trail user codes of conduct, responsible control of dogs and trespass. They should identify the permitted uses of the trail corridor and any potential hazards that may be encountered. User education programs and trail etiquette codes are essential as part of the implementation strategy. Emergency phone numbers and contact names or agencies are also important pieces of information. Establishing and demonstrating an emergency response mechanism is also an essential means of establishing comfort about landowner and user safety.

## **Fencing and Gates**

Especially in rural areas, adjacent landowners are often of the opinion that fences will need to be erected to prevent trail users from trespassing onto private property. While in some instances, this in fact may be necessary, it usually is not. In the presence of a properly designed and managed trail system, trail users are generally respectful and once the system is established trespass is not often a problem. In fact, for many trailways across Ontario where this has initially been considered as a serious problem, it has become a “non-issue” through basic design sensitivity to the concern.

With respect to fencing costs, precedents in rural areas under the Line Fences Act provide the basis for potential cost-sharing with landowners. In some communities the local Ontario Federation of Agriculture (OFA) has played a key role in the development of criteria to determine where fences are required and where they are not. Another option has been the application of the conservation authorities tree planting programs where the issue has been one more of privacy. Specific options need to be developed on a case-by-case basis.

## **Community-based Implementation Techniques**

In these days of shrinking budgets, the use of volunteers from the community is often necessary to the success of trails implementation projects. Community volunteers should not be viewed as simply a labour source. Public involvement in developing the trails system will be a valuable tool for increasing

the local understanding and appreciation of the area's natural heritage values and for generating community spirit and ownership.

## 3.7 Trail Inspection, Maintenance and Record Management

A trail maintenance system provides the framework to plan, prioritize, schedule, and track maintenance work by:

- Setting specific maintenance goals and standards for levels of service;
- Developing the necessary maintenance programs that will provide those levels of service;
- Executing those programs using the most efficient combination of resources;
- Providing post-construction monitoring and evaluation of constructed works;
- Controlling and evaluating the effectiveness of the work in relation to the desired level of service; and
- Furnishing cost data from which budgets can be built.

The first step in implementing a maintenance management system is to determine its scope. The Trail Inventory Plan and Master Plan when considered together form an excellent source of baseline data. A work log should be developed and updated when inventoried features are modified, replaced, removed or when other features are added. Trail logs are useful in the development of the maintenance budget and in determining the total to maintain the trail system. Logs are also useful when performing maintenance work by contract. If kept current, logs may be used to prepare documentation for contract packages, and show the location of structures and other features that require maintenance.

**Maintenance Levels:** Maintenance levels can be assigned to trails on the basis of criteria such as level of use, potential to affect resources, safety considerations, and tendency toward problems (vandalism, erosion etc.) Once maintenance levels are established, they should be reviewed and updated annually. When assigning maintenance levels, higher priority should be given to trails where use is significant. Traffic counters can be used to collect and record traffic volume data. This data collection should proceed on a continuing basis to provide needed information for planning, developing, monitoring, and confirming maintenance levels.

**Maintenance Activities:** Maintenance activities may be tracked by a broad category (e.g. level of maintenance or by trail category – casual, recreational, experienced). In addition to cost tracking of this general maintenance level, specific activities may be tracked to aid in the preparation of contract estimates or to compare in-house costs to contract costs for certain activities.

**Maintenance Standards:** Maintenance standards should be established to document work requirements to meet the acceptable physical standard, the acceptable end product for a maintenance level, or for a particular activity. The maintenance standard is met when all the work activities listed on the standard are completed.

An informal survey was carried out with a number of southern Ontario municipalities and trail groups. The following list is a brief summary of those findings:

- Overall trail maintenance costs per km per year vary widely from \$25.00/km per year for trails in a suburban or rural setting to \$340.00/km per year for a highly maintained trail system in an town or village setting.

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- Tasks that are performed on a **regular** basis (e.g. biweekly and monthly) include: grass cutting along trail edges in high use areas, litter removal and trash receptacle maintenance (weekly for high use areas) and biweekly for lower use areas, maintenance of trailside washrooms including portable units.
- Tasks performed on a **seasonal** basis include culvert cleanout, trailside pruning of vegetation, cleaning and refurbishment of signs (on a 3-5 year cyclical basis), cleaning and refurbishment of benches (3-5 year cycle).
- Tasks performed on an **as required** basis include moving or marking obvious hazards within 24 hours of their identification, inspection/monitoring of trail areas prone to damage following heavy storms, repair to vandalized items, minor repairs to structural elements such as bridges trail surfaces, railings, benches, gates and signs.
- **Major renovation/replacement of large items** such as bridges, kiosks, gates, parking lots, and asphalt trail surfaces was generally described as a 10-20 year cyclical item.
- Trail maintenance during winter months was reported in very few cases, and only for high priority/main trails.
- Regular trail inspections (daily to weekly) either by service vehicle (for long sections of rail trail) or by bicycle (for town or village trails) was consistently cited as a key factor in documenting existing problems and identifying potential problems.
- Preventative or proactive maintenance, especially with regard to trail surface condition, signing, trash and vandalism (including graffiti) were cited as a key success factor.
- In most cases, specialized equipment was not purchased for trail maintenance. The only exceptions were for trail grading and trailside weed removal (other than string trimmer).
- In most cases, parks crews, as part of their regular park maintenance role performed trail maintenance. Where extensive maintenance programs were reported, additional, seasonal labour was added to the workforce (often summer students). For some cases volunteer “adopt-a-trail” programs were identified as useful for basic trail cleanup and monitoring.
- In most cases, respondents felt that they could do a better job at trail maintenance, but were limited by resources (staff and time).
- The most common complaints regarding trail maintenance included the condition of the trail surface, vandalism, broken glass on trail surfaces and litter.

### 3.7.1 Suggested Maintenance Program:

The following briefly outlines the most common tasks that are part of a scheduled maintenance program for a trail system.

#### Regular monitoring

- Regular monitoring (daily/alternate day/weekly) to deal with minor problems and anticipate/spot major problems.

#### As Required

- Tasks performed on an **as required** basis include moving or marking obvious hazards within 24 hours of their identification, inspection of trail areas prone to damage following heavy storms, repair to vandalized items, minor repairs to structural elements such as bridges trail surfaces, railings, benches, gates and signs.
- Culvert cleanout.

# Trail Development Template

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## Spring start-up tasks

- Clear windfalls (where appropriate, depending on trail designation) and dangerous snags from the trails.
- Repair eroded sections, fill ruts, and refill approaches to bridges, corduroy and bridge ends.
- Check and repair waterbars drainage ditches, dips and culverts, construct additional facilities as required.
- Check and repair all structures as required. Monitor structures for signs of rot and structure failure.
- Check, realign and repair trail markers and signage as required, provide new/additional ones in areas where trail confusion is known to be occurring.
- Remove loose rock and debris from trail.
- Remove any litter left by discourteous users.
- Prune new plant growth to the specified trail clearing width dimension (where appropriate e.g. casual level trail).
- Aerate severely compacted soils and add granular surfacing to reduce compaction. Some trail sections may require temporary and/or permanent closure and rerouting.

## Regular tasks (biweekly/monthly during spring, summer and fall)

- Maintenance at trailhead facilities.
- Remove litter, empty garbage containers (weekly for high-use areas).
- Grass cutting in areas designated for mown turf in staging areas at Jordan Hollow and at the Bailey Bridge.
- Restock brochures at information kiosks.
- Check and evaluate windfalls.
- Examine trail for signs of over-compaction, depressions and water problems. Repair as required.
- Maintenance of washrooms

## 2 to 3 year maintenance cycle

The 2 to 3 year cycle will vary depending on intensity of use, initial design use and stability of the base. Typical tasks include:

- Reconstruction/realignment of drainage swales and drainage ways.
- Repositioning of culverts and some trail resurfacing.
- Repairing of structures as required.
- General brush removal, and trailside pruning of vegetation where required.
- Repair of signs and markers, cleaning and painting signs (on a 3-5 year cyclical basis).
- Cleaning and painting of other trailside amenities such as picnic tables, trash containers etc.

## 8 to 12 year maintenance cycle

Similar to the 2 to 3 year cycle, the 8 to 12 year cycle will vary depending on intensity of use, initial design and stability of parent soils. Tasks include:

- Rebuilding, rerouting and/or upgrading of trails.
- Repairing and/or rebuilding of structures.
- Replacement of some signs and markers.

## 4.0 Trail Template

### 4.1 Typical Trail Master Plan (Figure C)

The purpose of the Figure C is to illustrate at a conceptual level where each of the Typical Details (Figures 1.1 through 4.9) would be located. For ease of understanding and graphic clarity, each of the figure numbers is referred to in one typical location on the Typical Master Plan. Key elements depicted in the plan are grouped under 4 major headings. These include:

- Typical Trail Layout Details,
- Typical Trail Access Details,
- Road Crossings, and
- Trail Signing.

#### **SECTION 1: Typical Trail Layout Details**

##### **4.1.1. Trail Layout Patterns**

**Linear.** An “out and back” system that is very appropriate for long distance and goal oriented trails (“getting from point A to B”). The linear trail can form a spine from which side trails are can be accessed. This pattern may be most appropriate for abandoned rail corridors, utility corridors, roadway corridors and abandoned road rights of way. Trailhead facilities are located at each end and at appropriate interim points. Trail users (e.g. shorter distance users such as walkers) may be required to retrace their steps to get back to their starting point unless they are planning to travel the entire trail.

**Loop.** Preferred by most trail users over the linear system. Although it is an “out and back” system, the return trip is part of a circuit providing more interest than the linear trail because users do not have to retrace their route to get back to their starting point. The loop also reduces wear and tear on the trail since users generally only travel each arm of the loop once. Wherever possible, loops should be incorporated into the trail system, even if they are merely side loops running off a main linear spine trail.

**Stacked Loop.** The stacked loop has one trailhead and can offer a variety of experiences and distances. Stacked loops can accommodate a wide variety of user types and skill levels within each user group as can become progressively longer and more challenging the further away they are from the trailhead.

**Satellite Loop.** This system provides an even broader range of opportunities than the stacked loop as it reduces the length of the common portion of the trail. Different satellite loops can provide alternatives in terms of terrain, scenery, interpretive theme and challenge/trail type.

**Spoked Wheel.** With the spoked wheel layout concept, the trail head facility is generally centrally located within the system. Users can turn back to the trail head from a number of different points. This type of trail can offer a wide variety of trail types and challenges, giving the users the choice. It is also a good system in that trail users can turn back to the trail head at many points. This characteristic is valuable as trail users become fatigued.

**Maze.** The maze provides the opportunity to make maximum use of an area. It allows trail users to follow a route of their choice both in length and trail type. This system is the most complex to follow, therefore it is imperative that trails and distances are well marked so that users do become confused or lost.

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## 4.1.2. Generic Trail Types

As previously noted, not all trails are appropriate for all user groups. Different groups use/enjoy different trails in a variety of ways. Where single use trails are designed for specific groups, a variety of design criteria should be applied. Figure D outlines some of the key design criteria applied to the variety of trail user groups that might be expected throughout the HHTTN.

Generally, trails can be divided into three major groups: Single track, Multi-use and Separated trails.

### Single Track Trails

Single track trails are generally narrow and follow the topography quite closely. Typically 0.5m to 1.5m in width it usually has an earth, mown grass or wood chip surface. In areas where grades exceed 10% over long distances and traffic is high, it may be desirable to provide a hardened surface (stonedust, tar and chip) in order to reduce erosion and to help prevent trail widening. Special consideration and trail design techniques regarding trail drainage and erosion prevention should be taken into consideration.

### Multi-use Trail

The multi-use trail accommodates a wider spectrum of users including cycling and wheelchairs where grades are acceptable. It is wider, and has an asphalt (primary) or asphalt and stonedust/limestone screening (secondary) surface. Asphalt should be provided on secondary trails where volumes of use are high. The clearing width, clearance zone and sight lines are greater than those for a footpath. Typically, these types of off-road trails have been located within the built-up areas, in existing parks with potential connections through school properties (subject to cooperative efforts with the school boards). The multi-use trail can accommodate several user groups at the same time and provides adequate room for faster users to overtake and pass slower users.

### Separated Trails

In some areas, where adequate space exists, it may be appropriate to provide physically separated trails for various uses. It is appropriate to examine opportunities to provide physically separate trails, creating opportunities for both faster multiple uses as well as slower, trail uses within the same corridor. Where this design treatment is appropriate, separation can be accomplished by physical distance, grade separation, or vegetated buffers. Appropriate signage educating users about acceptable trail uses and “codes of conduct/rules of the trail” are critical to ensure the longevity of the separated system.

## 4.1.3. On-Road Design Standards

In some areas it may be impossible in the short term and difficult in the long term to develop trails entirely off road. Where publicly accessible lands are not available and access agreements for trails on private lands are not feasible, it is necessary to provide connecting links using the road network. When the road network needs to be accessed for trail use, understanding and following regulations is paramount.

### Snowmobiles and Other Motorized Uses

The Highway Traffic Act (HTA) and the Motorized Snow Vehicles Act (Bill 101, July 2001) regulate the use of vehicles on roadways. These provide clear direction regarding the safe and legal operation of authorized motorized vehicles and must be consulted where consideration is being given to the use of the road network.

The Ontario Federation of Snowmobile Clubs (OFSC) has developed standards regarding signing and trail grooming, but defers to the HTA and Bill 101, and local municipal bylaws regarding the operation of and appropriate on-road routes for snowmobiles within local municipalities.

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## **Bicycles**

Bicycles are designated as a vehicle under the HTA and as such are required to obey all of the same rules and regulations as automobiles when being operated on a public roadway. The Ministry of Transportation (MTO) and the Transportation Association of Canada (TAC) have developed standards for the design of on-road facilities and signing for on road-bike system. Several options exist for on-road cycling routes including: on-road signed route, paved shoulder, bike lane, and wide shared-use lane (refer to figure 1.6). Generally on-road routes can be described as follows:

### **Bike Lanes (Built-up areas)**

Bike lanes are typically located on town or village roads (with curb and gutter) to create a physical space reserved for cyclists. The diamond symbol and bicycle symbol painted on the pavement in addition to roadside signs are useful on higher volume and higher traffic roadways. Providing the physical space on the roadway is an excellent method of encouraging a higher percentage of the population to cycle on-road over the long term. In areas where on-street parking is present, the bike lane should be continued if space permits. Where roadway widths are limited, and relocation or removal of parking is not an option, the bike lane must be properly terminated which includes both the road surface painting as well as road signage.

### **Paved Shoulder (Rural areas)**

Paved shoulders are a relatively easy way to provide a space for cyclists where the roadway cross-section is of a rural characteristic (shoulders without curbs). Where sufficient public land is not available, other trail and bikeway systems have used paved shoulders as a method of connecting communities through rural areas. Other user groups such as walkers and runners use this on-road space. Paved shoulders provide longer loop opportunities typically for cyclists, and provide future opportunities for connecting communities as they grow. It has also been shown that paved shoulders are not only a benefit to cyclists, but also reduce erosion and long-term maintenance costs of the road, and reduce the potential for single vehicle accidents.

### **Wide Shared-Use Lanes (Built-up areas)**

Wide shared-use lanes are used on roads where vehicle speeds or traffic volumes are higher than those noted below for signed routes. The bicycle symbol and “shared use” are painted on the road at regular intervals to inform road users to expect cyclists.

### **Signed Routes (Built-up areas and rural areas)**

Built-up Areas: Signed routes are typically found along roads where traffic volumes are low (less than 400 vehicles per day) and traveling less than 75 km/hr. In this case there is no designated space for trail users. Signs located at changes in direction or at street corners help trail and bikeway users find their way. This type of connecting route is typically situated in residential neighbourhoods where there are no off-road opportunities to create trail and bikeway routes, or where a direct connection between destinations is desirable. Along signed routes where the street is very narrow, “share the road” signs can be erected. On a signed route pedestrians typically make use of sidewalks.

Rural Areas: Signed routes are recommended for quiet rural roads where traffic volumes are low. This type of route can be used by cyclists, pedestrians, equestrians,

#### **4.1.4. Special Trail Treatments**

Where trails must pass through sensitive environments such as wet or boggy soils, areas with a proliferation of large roots that are either exposed or near the surface, or areas with steep side slopes, structural intervention may be required to maintain the integrity of the trail and minimize environmental damage. Boardwalks, elevated walkways, turnpikes, retaining walls and stair systems are a few of the

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appropriate methods.

Figures 1.6 through 1.10 illustrate potential solutions for overcoming several of the most common repair issues on single-track trails. Erosion by water or heavy foot traffic is one of the most common causes of single-track trail damage. The following treatments describe potential remedies for problems in these conditions.

## **Waterbars**

The waterbar is an obstruction to water runoff and is set at an angle across the treadway, directing water off of the trail to nearby vegetation. It is a good method of controlling erosion on long slopes where running water can cause severe erosion. Waterbars should be installed on long runs where slopes exceed 10%. The slope must be studied so that an adequate number of waterbars can be installed to effectively intercept and remove water at regular intervals. A good guideline is one waterbar for every 20m of trail.

The waterbar can be constructed using logs or stones. Note if logs are being used, preferred diameters range between 150mm and 200mm. Spruce, fir, hemlock and cedar are appropriate material types. If stone is being used, select stones that are at a minimum 150mm thick, and should be rectangular in shape. The waterbar should be placed at a twenty-degree angle across the trail. Rock waterbars are preferred to log waterbars for cycling trails because logs often become slippery when they are wet. Signs should be posted in advance of waterbars to give cyclists ample warning. Where logs are used, the waterbar must be secured in place.

## **Bridges**

The trail bridge is used to cross depressions or streams. Use designed (engineered) bridges for spans over 5m or over hazardous waters. All lumber should be rough sawn Eastern White Cedar (*Thuja occidentalis*). An edge restraint should be used for bridges without railings. Railings should be incorporated where the bridge is more than 600mm above the surrounding grade.

Where existing bridges may be present, including those structures that may have originally been railway bridges (in that case of abandoned railway corridors), a thorough inspection should be undertaken by a qualified structural engineer who can make recommendations regarding existing conditions and can provide recommendations to meet safety requirements. Other similar studies have concluded that new decking and railings are usually required as a minimum improvement. Where required, new decking and railings should be designed and constructed to consistent standards.

## **Raised Trail/Turnpike**

Turnpikes can be used along the trail in wet areas where a trail on grade will become rutted, or in a sensitive area where it is desirable to keep foot traffic off fragile vegetation. A turnpike is an effective low tech, low cost method that works very well in areas where organic soils are encountered. Turnpikes should be constructed with Eastern White Cedar (*Thuja occidentalis*) for durability and longevity.

## **Drains**

Drains should be installed on trails in locations where the normal cross slope will not allow for proper drainage. Cobble drains are effective in areas where there is a small amount of water flowing on a regular or intermittent basis. Other methods of cross drainage should be considered for small streams and creeks. Cobbles should consist of stones ranging in diameter from 50 - 100 mm that have been collected and stockpiled during trail construction. Install the cobbles so that they are 2/3 buried and 1/3 exposed.

## **Switchbacks**

Pedestrian, motorized and some self propelled users are capable of ascending grades of 30% or more. Some users are limited to grades of 15-20%. Switchbacks are a method of ascending steep grades that allow for rest areas at regular intervals. Equally important, they provide ample opportunity to remove

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water from the trailbed at regular intervals which in turn reduces the erosion potential of water. They are constructed with turns of about 180 degrees and are used to decrease the grade of a trail traveling up or down a steep slope of 30% or greater. Typically they require extensive grading and are recommended only in locations where construction activity will not cause further disruption to the surrounding environment (refer to Figure 1.3)

## **Trails within the Road Right-of-Way**

Trails may be located within the road allowance adjacent to the roadway. However, in situations where a roadway will be newly constructed or significantly reconstructed there is an opportunity to position the roadway closer to one side of the road allowance to provide more space for the trail (refer to figure 1.4). Figure 1.4 also illustrates a trailway on the traveled portion of the road that is shared with automobiles. This option can be used in rural areas where traffic volumes are low. Where a route is designated for a right-of-way or road allowance there may be the opportunity for the development of two parallel trails to accommodate different user groups (refer to figures 1.1 and 1.2).

## **4.1.5 Trail Closures**

### **Temporary Trail Closures**

From time to time trail closures may be necessary to temporarily close the trail to user access. Situations such as inundation by water, culvert washout or general trail construction are typical causes for temporary trail closures. As these situations arise, users must be informed well in advance of the closure. If the closure is planned (e.g. for construction) advance notices should be placed at all access points for the affected section (s). In the event of an emergency closure, notices must be placed at these locations immediately following the discovery of the problem. Signing and temporary barricades are one possible method of informing users of temporary trail closure.

### **Semi- Permanent and Permanent Trail Closures**

Trail closures are usually required at some point in the life cycle of the trail. It is important when closing a trail to restore it to its previous condition, to let trail users know that the trail is closed, and give reasons for closure.

All trails to be closed and severely disturbed areas such as eroded slopes must be rehabilitated. Rehabilitation measures should be developed in a manner that is visually and ecologically consistent with the surrounding area. Rehabilitated areas should be designed so that they require minimal maintenance until establishment, and none thereafter.

Appropriate rehabilitation measures may included but are not limited to:

- Slope stabilization, using engineered material and methods for severely eroded slopes.
- Terracing, using locally collected low-tech materials for eroded slopes of moderate and low severity.
- Live staking using locally collected cuttings from appropriate species.
- Application of erosion preventative blankets and mulches impregnated with seed or applied after seeding.
- Seeding with mixes that are ecologically representative of the site in which they are to be applied and that contain seed from all layers of the canopy.

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- Dense plantings of native, indigenous species, preferably propagated from local seed sources as opposed to asexual methods of reproduction.
- Riparian habitat restoration and creation using appropriate methods and low-tech materials locally collected materials.

Scarify the surface of the trail to be closed and cover with forest litter collected during the construction of the new trail. Place the forest litter (leaves, branches, and limbs) in a naturalistic manner. This gives the message that the trail is closed and also helps to reduce erosion and supply nutrients to plants during establishment. Replant the closed trail with native vegetation placed at close centres (300mm-450mm spacing between plants). Consider using salvaged plants from trail relocation from widening projects in the vicinity.

## 4.1.6. Trail Surfacing Options

### Stonedust (Limestone Screenings)

- Materials of fine particle size which when applied to a trail surface create a smooth solid surface that all trail users can negotiate with confidence. This type of surface is generally appropriate in rural areas where it is in keeping with rural character of traditional country lanes and routes.
- Stonedust is best used as a top course or as a trail hardening material on trails with a low to moderate erosion problem, and that are generally dry. It is not suitable as a base material for wet trails or on soils with low stability. A coarser granular is recommended for these situations.
- It is recommended that the ultimate surface treatment for the main multi-use corridors be stonedust. A 150mm bed of compacted fines is useable by the widest range of trail user groups and it can be easily regraded as part of the maintenance of the trail bed. Occasional “topping up” of the base may be necessary. This should be assessed at the time of maintenance regrading. Other granular (gravel) surfaces are not recommended as some user groups such as cyclists report that gravel surfaces are difficult to negotiate on all but mountain bikes. Several trail organizations have tried various methods of bed treatment along abandoned railway corridors. To date, the most successful appears to be a compacted layer (minimum 150mm thick) of stone dust fines
- In areas where the surface is more prone to erosion, it is recommended that crusher fines be used. Crusher fines are slightly more coarse than stonedust and will drain more efficiently. This typically occurs where the corridor cross-section is concave and there is a tendency for water to flow parallel to the corridor.

### Asphalt

Because asphalt can be visually intrusive, and expensive to install, it is generally appropriate for town or village trails experiencing a high level of use, or where users such as children, wheelchair users and rollerbladers are intended.

- Asphalt is a very durable and flexible surface material that is costly at the time of installation but requires very little maintenance for up to ten years if properly installed.
- The life span of an asphalt trail is entirely dependent upon the quality of the installation. A proper base must be installed and compacted prior to the installation of the asphalt surface.

### Natural or Earthen Surfaces

- This is the most cost-effective and preferred trail surface material for lower-use trails. Earthen surfaces look the most natural and generally do not require additional material to be imported.

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- Poorly drained and permanently wet soils generally do not make for good trail surfaces. In this situation, alternative trail surfacing materials need to be considered.

## **Soil Cement**

- Soil cement is a mix of cement, water and parent materials from the trail bed. This is an excellent mix for repair of eroded sections of trail which receive high traffic, and for trail repairs in remote areas as fewer materials (volume and weight) need to be imported. Because soil cements use existing parent materials, they look very natural and fit well with surroundings.

## **Bark Mulch and Wood Chips**

- Bark mulch and wood chips are good for walking and hiking trails, and are well suited to areas where tree roots are exposed, but can migrate under heavy foot traffic. Regular inspection and maintenance are recommended to keep wood chips in place. Woodchips are generally not recommended for trails with cycling traffic.

## **Gravel**

- Gravel should only be considered for trails in areas of high traffic or areas subject to moderate degrees of erosion. Generally, gravel is not suitable for the main trail bed as it is difficult for some users to negotiate and may be considered to be too rough.
- Where gravel-based materials are necessary, crushed gravel products are best because the angular crushed granules interlock to create a more stable surface.

## **SECTION 2: Typical Trail Access Details**

### **4.2.1 Major and Minor Staging Areas**

Minor staging areas (figure 2.1) are located at intervening intervals throughout the study area. Ideal locations for staging areas are: community parks, conservation areas, former railway station lands and other publicly-owned property. In some locations it may be possible to share parking and washrooms with other community facilities. Typically, minor staging areas should be considered at approximately 10km to 25km intervals throughout the network.

Major staging areas are generally proposed for high-profile locations in larger communities and at fairly regular intervals throughout the network. If a large network of trail exists, a good rule of thumb for major staging areas is one every 25km or in major communities where the distance between these communities exceeds 25km (refer to figures 2.2 and 2.3).

Typically, these amenities are located at major points of access to the trail system, often where the trail is highly visible to passing motorists such as at crossings of heavily traveled roads or community focal points such as community centres and parks (refer to figure 2.3). A well-designed trail staging area typically incorporates the following elements:

- parking (the number of spaces required varies depending on the anticipated level of use-more spaces for a major staging area);
- easy access to and from the trail system (major and minor staging area);
- ample room to load and unload equipment (space requirement will vary depending on permitted trail uses-major and minor staging area);
- secure bicycle locking facilities (major staging area or minor staging area where cycling is a permitted use);
- hitching rails and tack-up areas (equestrian-major and minor staging area where equestrian use is permitted);
- trash receptacles (major and minor staging area);
- lighting (may or may not be included depending on location-most often associated with a major staging area in a built-up environment);
- signing (including trail directional signing and mapping/interpretive signing so that trail users can plan their journey-major and minor staging area);
- potable water and washrooms in some locations (major staging area for permanent facilities and minor staging areas for permanent or portable facilities); and,
- seating and or picnic/informal activity space (more often associated with a major staging area that includes an open gathering space).

Depending on the size and nature of the staging area, a food concession may also be desirable. If there is no space available on the site itself, locating close to an existing concession or encouraging the development of one nearby by a private entrepreneur can promote greater use of the staging area and trail system.

Washrooms must be provided along the trail. Typically, they are located at major and minor staging areas and major trail nodes. They must be placed where they can be easily accessed for service and maintenance. Many trail groups have tested portable washrooms at throughout their system prior to installing permanent facilities (small building with concrete holding tanks). This enables groups to determine the most appropriate location for washroom facilities.

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Bicycle parking at trailheads, rest stops and interpretation nodes allow the user to confidently secure their bicycles while pausing along the trail, enjoying nearby attractions and/or services, or preparing to embark on foot. Determining priority locations and phasing for bicycle parking locations, and other trail amenities, is an important aspect of trail network development.

## **Other Minor Public Access Points**

In addition to major and minor staging areas as described above, trail access points may be located on smaller parcels of land. Minimal amenities for this a minor trail access point include parking for 3-5 cars, access barriers, trash receptacles and trailhead signing. These access points can be planned for some road crossings (where public land is available) or within publicly owned lands (i.e. public parks). Refer to figure 2.6 for a typical minor access point that includes a canoe launch.

## **Trail Junctions and Nodes**

A junction is an intersection 2 or more trails. Junctions are ideal locations for nodes offering rest stops and wayfinding opportunities through directional signage and/or trailside mapping. Refer to figures 2.4 and 2.5.

**SECTION 3: Road Crossings**

**4.3.1. Roadway Crossings**

The design of roadway crossings should consider the following (refer to figures 3.1 to 3.6):

- development and maintenance of an open sight triangle at each crossing point;
- proper gating and trail identification on gates/barriers;
- proper signing along the roadway to alert motorists to the trail crossing;
- proper signing along the trail to alert trail users of the upcoming roadway crossing (refer to figure 4.2);
- alignment of the crossing point to achieve as close to possible a perpendicular crossing of the roadway to make the crossing route direct and minimize the time that trail users are in the traveled portion of the roadway;
- lockable barriers that remain in the closed position during spring, summer and fall, and are opened only for service access and/or special events (refer to figures 3.7 and 3.8). Where winter snowmobiling is permitted, the barriers should be left in the open position from the time of the first major snowfall until snowmelt. Although the barriers are to be equipped with reflectors making them visible during low light and night conditions, leaving the barriers open during snowmobile season (in appropriate sections) will minimize the potential for accidental collisions with the barriers. This model has been used successfully by other trail organizations that permit snowmobile use on multi-use trails during winter months.

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## **SECTION 4: Trail Signing**

Signing is a critical element in the design of trails. It serves many important functions. Some of these include:

- to advertise the trail system (provide landmarks), to attract new users,
- to guide (new and repeat) users to the appropriate starting point,
- to provide users with information about the trail route, trail-related events, accessory facilities (both part of the trail and in nearby towns),
- to inform users of their responsibilities while using the trail,
- to provide interpretation of local historical, cultural, natural and other resources,
- to provide information regarding trail safety while traveling (e.g. rate of travel, upcoming hazards, junctions and crossings), and
- to alert motorists traveling on roadways of upcoming trail crossings.

The design and construction of the trail signing system should incorporate a hierarchy of signs each with a different purpose and message. This hierarchy is organized into a “family” of signs with unifying design and graphic elements, materials and construction techniques. The unified system becomes immediately recognizable by the trail user and can become another of the branding elements for the trail. Consistent with this approach is the correct and repeated use of the trail logo on all signage, which in turn reinforces this identity.

Figures 4.1 to 4.8 provide details regarding a signing family for the HHTTN. Generally the HHTTN family of signs includes:

- motorist orientation/gateway signs typically located at key intersections in the roadway network. These are used to guide new trail users to the staging areas, and also serve as a “trail identifier” advertising for the system, potentially attracting new trail users to the HHTTN (figure 4.1 sign **type A**). The HHTTN has already developed the gateway sign, several of these have been installed at key locations in the County.
- motorist directional signs which includes the use of the Tourism Oriented Destination Signage (TODS) system. These are placed at critical locations throughout the regional road network to guide trail users to appropriate locations (see discussion below)
- trailhead/orientation signing typically located at staging areas and major trail nodes. This provides orientation to the trail system through mapping and interpretive information. Larger in size, trailhead signs are visible from a distance. Where staging areas are visible from the roadway, this type of signing can be used as a trail “identifier” for the motorist (figure 4.1 sign **type B for major staging areas** and sign **type E for minor staging areas**).
- trail node signs are typically located at key trail intersections. Smaller in size and stature than trailhead signs, they can be used for wayfinding throughout the system. In key locations, trail node signs can be used to display interpretive information (figure 4.1 sign **type E**).
- trail directional signs should be located at every trail intersection to cue trail users for destinations and in some cases, distances to destinations. Directional signs typically are smaller and simpler in design than trail node or trailhead signs (figure 4.1, sign **type C**).
- trail marker signs should be located at regular intervals i.e. 500-1000m along the trail. The purpose of trail marker signs is to provide a simple visual message to users that they are still on the route. In many cases, trail marker signs take the form of a bollard with the trail logo and distance marker clearly displayed (figure 4.1, sign **type D**).

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- trail rules and regulations signs should be posted at every public access point to clearly articulate what trail users are permitted, regulations and laws that apply, as well as trail etiquette, safety and emergency information. Reminder signs may be needed at various locations such as “ Private access, keep to the trail”. At trailheads, this information can be incorporated into trail head signs. In other areas, this information can be posted on access barriers (refer to figures 3.8 and 4.6).
- Interpretive signs should be located at key trail features having a story to be told. These features may be cultural, historical, or natural. Interpretive signs should be highly graphic, easy to read, and wheelchair accessible (figure 4.1, sign **type E**).
- Regulatory Signs are required throughout the system. Where traffic control signs are needed (stop, yield, curve ahead etc.), it is recommended that recognizable traffic control signs be used, as are found in the Ministry of Transportation for Ontario’s (MTO) *Manual of Uniform Traffic Control Devices*, 1996 and *the Ontario Bikeways Planning and Design Guidelines*, 1996, and the *Bikeway Traffic Control Guidelines*, 1997 from the Transportation Association of Canada.
- Trail Donation Boxes are tamper proof and vandal resistant structures that can be placed at trail heads and major points of access throughout the system. They are intended to solicit voluntary donations that can be put towards further development and operation of the HHTTN. Figure 4.9 is a design concept for a trail donation box. This design has been adapted from models currently in use by agencies in southern Ontario for both voluntary donation and user-pay stations.

## Considerations for Sign Design

When designing sign structures and graphic panels, a number of criteria should be considered. Some of the key criteria include:

- Durability-materials and construction methods selected should be resistant to the elements including rain, snow, ice and ultraviolet radiation.
- Vandal resistance-selection of materials and construction methods to discourage attempted acts of vandalism. Assembly methods, fasteners, protective coverings and finishes should have vandal resistant properties.
- Visibility-signs must be visible for all trail users. Size of signs, use of colour, level of information (text and graphics) must be considered. Achieving the balance between too much information and not enough information can be difficult. The use of graphics and internationally recognized symbols can often be used to replace text and overcome language barriers. Visibility at night through the use of reflective materials should also be considered. This can be especially important where low light and night use is expected (e.g. snowmobile trails).
- Aesthetics-can not be overlooked. Signs must be functional, but also need to be well designed and carefully constructed. Signs are part of the trail user experience. The quality of the signs sends messages to trail users about the quality of the trail and the trail management. An aesthetic has been established for the HHTTN through the design and construction of the first gateway kiosks. All other signs must project this image and quality.

## Tourism Oriented Destination Signing (TODS)

Two general options are available when considering motorist orientation or roadside signing. These include the development of a system unique to the HHTTN, or purchasing rights to use an established system. A properly designed and constructed unique system could become another “member” of the HHTTN “family”, but not without significant cost. The development of this system would require design and approvals from local and provincial authorities. In addition, maintenance and replacement becomes the responsibility of the HHTTN.

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It is recommended that the HHTTN investigate the use of the TODS signing system. This system has been recently introduced in Ontario, and is based on successful models elsewhere in North America. Although a substantial investment is required to become part of the system, it has several advantages:

- the system has been developed and designed in cooperation with the Ministry of Transportation and therefore approval requirements have been met.
- significant research has gone into the development of the system and it has been “tested” with the public. The system has become widely used and is very recognizable, therefore the “branding” has already been accomplished. As such, there is no need to reinvent a system to compete with one that has become well recognized. .
- costs for maintenance and replacement are incorporated into annual fees for use of the system, leaving one less task the HHTTN to have to deal with.

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## Sign Placement

The following chart provides some guidance regarding the frequency with which each sign type should be placed throughout the trail system. It is important to note that this chart is intended as guideline only and that signage must be considered on a site-specific basis. Further guidance regarding placement of signage is provided throughout figures 1.1 to 3.7.

<b><u>Sign Type</u></b>	<b><u>Frequency /Typical Location</u></b>	<b><u>Other Comments</u></b>
Type A (motorist/gateway sign)	At key major intersections or roadside locations associated with other gateways, information centres, or other civic features (e.g. community parks)	Requires space for parking, should be designed as part of a “setting” with other amenities such as benches, paths, garbage containers, and landscaping. The location should be prominent and large enough to accept the scale of the structure.
Motorist Orientation Sign (TODS sign)	Along major road/highway corridors, at major intersections, to provide cues for turnoffs to trail access points	Follow guidelines established through TODS administrators.
Type B (major trailhead sign) Type E (minor trailhead sign)	At every trailhead. Frequency of trailheads determined at a network level. Refer to section 4.2.1. for discussion of trailhead locations	Must be considered as part of an integrated design for the trailhead site (refer to figures 2.1, 2.2, 2.3)
Type C (directional sign)	Where main trails intersect with other main trails, where main trails intersect with minor trails, at connecting links to nearby communities.	
Type D (marker sign)	At regular intervals along the trail system (500m for rural trails with motorized uses, 100m for urban/town trails where walkers are a major user group). At trail directional change points	
Type E (interpretive sign)	Located within view of features to be interpreted. .	Frequency dependent upon number of features to be interpreted and anticipated major trail user mode.  Consider 1 sign for every 20 minutes of active trail use (20 minute walk, 20 minute ride) for an interpretive trail.  For trails where sporadic features are to be interpreted, signs should be located at feature sites.
Regulatory sign	As required throughout the system to inform users of maximum rate of travel, hazards etc.	Refer also to Figure 4.2 for specific sign types recognized by MTO and TAC.  To be placed in advance of feature/point. Distance from sign to feature is determined by design speed of trail to allow users sufficient reaction time (minimum 30m is recommended).
Rules and regulations sign	At each trailhead, access point or roadway crossing	Can be stand alone sign or can be incorporated into trailhead signs

## 5.0 Capital Costs

Figure 5.1 provides a breakdown of trail capital costs on a per unit basis. These estimated unit costs for on-and off-road trail and bikeway construction are based on averages obtained from a number trail construction projects in various municipalities in Ontario. They can be used as a guideline for establishing the costs for implementation of trail segments. The unit costs assume typical conditions for construction. For off-road trails, the unit prices assume good soil conditions, and a minimal requirement for grading, and are for the construction of the trail itself. Additional items such as signage and other amenities are listed separately. Figures for on-road facility construction do not include specific conditions such as utility relocations and driveway restorations. As such, the unit prices listed here are for guideline purposes only. As each trail segment becomes a priority for construction, detailed study will be required as part of the detailed design process to determine site-specific conditions and design details. Detailed cost estimates can then be developed from this work.

## 6.0 Summary

This Trail Development Template is one of the key ingredients for a popular, recognizable, safe and successful trail network in the Haliburton Highlands. The template sets out a series of guiding details that help to form a framework. Like any other Master Plan or guiding document, this document is intended to be flexible and to evolve with time.

Therefore, it is recommended that the HHTTN engage in the following steps in using the template:

1. Examine opportunities to apply the typical details as described in the template.
2. Study each situation on-site to understand its unique aspects.
3. Apply the appropriate details and guidelines.
4. Monitor the success of the application as a method of making improvements to the understanding of trail design in throughout the HHTTN and across Ontario.
5. Build the template by adding other appropriate details and guidelines as other circumstances and potential solutions present themselves.

For further information on how to use this template contact:

**Coordinator**  
Haliburton Highlands Trails & Tours Network  
Box 147  
Minden, ON K0M 2K0  
(705)-286-1760  
1-800-461-7677  
Website [www.trailsandtours.com](http://www.trailsandtours.com)  
Email [info@trailsandtours.on.ca](mailto:info@trailsandtours.on.ca)

## 7.0 Selected References

In addition to a number of trail planning and design projects completed in the past four years by the Landscape Architectural Group at ESG International, several references were consulted. The following list of selected references may provide additional helpful information to trail managers and builders.

Barbara Sokoloff and Associates, Bryant Associates Inc. 1996. Bicycle Facility Planning and Design: A One Day Workshop for the Rhode Island Department of Transportation. Bicycle Federation of America.

Exall M (editor). 1985 Cross Country Ski Trail and Facility Design Manual. Ontario Ski Council. 208pp

Ontario Bikeways Planning and Design Guidelines-working draft. 1995.

Hope, D, and Dwight Yachuk. 1990. Community Cycling Planning and Design Guide-working draft. Prepared for the Canadian Institute of Planners, Ottawa, Ontario

IMC Consulting Group. 1996. Medway Valley Heritage Forest Site Planning Study. Prepared for the City of London Ontario.

McCoy, Michael and Mary Alice Stoner. 199?. Mountain Bike Trails: Techniques for Design, Construction and Maintenance. Bikecentennial: Missoula, MT.

Ontario Ministry of Natural Resources. 1993. Operations Manual for BackCountry Managers. Queen's Printer for Ontario

Proudman, R. D. and Reuben Rajala. 1981. AMC Field Guide to Trail Building and Maintenance: 2nd Edition. Appalachian Mountain Club in association with the U.S. National Park Service. Boston Mass.

Province of British Columbia, Ministry of Lands and Parks. 1993. Park Facility Standards Manual Volume 2. BC Parks Visitor Services.

U.S. National Park Service. 1990. Economic Impacts of Protecting Rivers, Trails, and Greenway Corridors: A Resource Book.

Sprung, Gary (editor). International Mountain Bicycling Association (IMBA). 1995. Trail Development and Construction for Mountain Bicycling. A Collection of Resources.

Turner, David, Lisa Mactaggart and Anita Stok. 1992. Caledon Rail Trail Design Guidelines. Department of Parks and Recreation.

Mountain Trails Management: An Outline in Trail Development and Construction for Mountain Bicycling: A Collection of Resources. International Mountain Bicycling Association: Boulder, Colorado.

Victor Ford and Associates. 1993. Design Guidelines for the Waterfront Trail-working draft. Prepared for the Waterfront Regeneration Trust. Toronto Ontario.

Volunteers for Outdoor Colorado. 1992. Crew Leader Manual. Denver Colorado. 93pp.

## Glossary of Terms

<i>Blaze:</i>	A standard trail mark cut into the bark of a tree with an axe to designate the trail location.
<i>Bridge:</i>	Any structure spanning and permitting passage over a river, stream, chasm, canyon or road.
<i>Clearing:</i>	The corridor, both vertical and horizontal, from which vegetation is cleared .
<i>Carrying Capacity</i>	Number of people which the land can accommodate and still retain its wilderness characteristics related to its ability to provide experiences of a certain specified minimum quality to the individual participants; number of visitors (probably broken down into specific categories) which an area can tolerate without damage.
<i>Corduroy</i>	A log structure laid on the ground for the purpose of crossing swampy areas. Usually consists of stringers, decking, and often a soil or loose gravel tread.
<i>Cross Slope:</i>	The measurement of the prevailing existing grade or trail cross section taken perpendicular to the existing or proposed trail centreline.
<i>Degree of Difficulty</i>	A rating system for trails or trail segments established to determine the experience level (novice, intermediate, advanced) and who should use them.
<i>Grade Separation</i>	Is the vertical separation of trail routes through the use of a structure, slope or plantings
<i>Highway</i>	Is a general term denoting a public way for the purpose of vehicular travel including the entire area within the right-of-way
<i>Horizontal Clearing Width:</i>	That width which must be cleared of all surface vegetation, rocks, and other obstructions which would otherwise infringe upon freedom of trail passage.
<i>Landing:</i>	That portion of the switchback between the upper and lower legs with a low profile grade which functions as the turning surface for users.
<i>Loop Trail:</i>	A trail which returns the user back to the original beginning point.
<i>Multi-use Trail</i>	Is any off-road dedicated facility for pedestrians and other permitted users
<i>Percent Grade:</i>	A figure used in determining the degree of climb or descent of a trail. (Vertical distance divided by horizontal distance equals % grade.
<i>Right of Way</i>	Is a general term denoting land, property, or interest therein.
<i>Sideslope:</i>	The natural slope of the ground measured at right angles to the centerline of the trail, or the adjacent slope which is created after excavating a sloping ground surface for a trailway, often termed as a cut-and-fill-slope, left and right of the trail base and tread.
<i>Sight Distance:</i>	Refers to the distance a trail user can safely and clearly observe the trail, intersecting trails and roads ahead.

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intersecting trails and roads ahead.

**Swale:**

Low lying ground where drainage usually collects

**Switchback:**

A sharp short radius curve in a trail that is used on hillsides to reverse the directions of travel and gain elevation

**Trail Clearing Height**

Normally a trail is cleared to a height of eight feet, or as high as one can reach. On slopes, members of the crew can stand uphill from their work, bringing high branches more easily into reach. Where trees are large, a canopy should be left over the trail. This will help shade shrubs, weeds, and grasses, dampening their usually prolific growth. Correspondingly, one can enable wildflowers to grow by clearing back the canopy to let in sunlight. This can be done selectively to minimize the "highway" appearance of excessive clearing. In the case of a trail that is popular in winter, the maintainer may be wise to clear it particularly high. This will enable easier travel when snow up to three or four feet deep lies on the ground. This high clearing can be done in the summer with species tools such as a pole pruner or pole saw. However, it can be more easily accomplished with a winter trail clearing session.

**Trail Drain:**

An outslope to the trail at a naturally occurring low point for the purpose of allowing drainage off of the trail without other more intensive improvements.

**Trailhead:**

A developed area which serves as the beginning point of a trail or trail segment.

**Trail Width:**

The proper width for a cleared trail varies with terrain and vegetation. A four to six foot clearance suffices in most situations. In thick growth a three foot clearance may be most practical and possibly even desirable, it provides a pleasant tunnel effect

**Tread:**

The trail surface on which trail movement occurs

**Vertical Clearing Height:**

That height above the trail surface which must be cleared and maintained to allow freedom of trail passage

**Water Bar:**

A device for turning water off the trail, usually made of logs, stones, soil cement, or by contouring the native material within the trail prism. An enlarged modification of a dip installed at an angle across the trail base, with approximately a 45 degree skew