

A topographic map background with contour lines and elevation markers. The map shows various elevations such as 500, 750, 1000, 1200, 1400, 1250, 300, 500, 750, 950, 1000, 1100, 1200, 250, 350, 550, 800, 900, 1000, 450, and 750. The contour lines are blue and the text is white.

Section 5

MAINTENANCE AND MANAGEMENT

The progress of your trail does not end at the completion of its construction. Once your trail has been opened to users, maintenance responsibilities begin and continue for as long as your trail is in operation. The frequency of maintenance will vary according to your trail classification and type, its season(s) of operation, and its level of use. A wilderness hiking trail requires less frequent and less involved maintenance than an urban multi-purpose trail. Wilderness trail hikers desire and expect minimal alterations to the effects of nature's forces and processes. Trail inspections would be done occasionally and maintenance activities would be performed where there is danger or an obstacle prevents hikers' movement. An urban multi-purpose trail tends to operate in at least two or three seasons, and can have high recreation and commuting traffic. The users of these sorts of trails want safe and barrier-free trails for family activity, leisurely strolls, easy commuting, or safe cycling and in-line skating. This means certain trails need routine maintenance operations.

5.1.1 MAINTENANCE SYSTEM

Like the designing and construction stages, the maintenance system needs a plan. As a trail operator, you will want to sustain a safe and enjoyable trail, and prevent degeneration of the trail its surroundings and its features. Putting a system or program in place and in practice will help keep your trail safe, functional, attractive, and long-lasting. The guidelines below will direct you in producing such a system.

Set Maintenance Objectives

Every trail project has unique characteristics, and therefore, requires individual objectives. Even trails within one same trail system may require special objectives apart from the rest of the trails. For every trail, key objectives include securing user safety, maintaining trail purpose and objectives, and ensuring that standards specified for the design and construction stages have been met.

Assess Trail Needs

Make a list of maintenance activities and seasonal requirements which are needed to meet the stated objectives. Be sure to indicate on which section of the trail these tasks are to be done. Here is a short example of an all-season trail used for cross-country skiing in the winter and for walking mainly in the summer and autumn.

Example: section of list of maintenance needs

Cobalt Loop		
Seasonal Preparations for Winter and Summer		
	Fall	Spring
East Side of Loop	Shelter: 1) install exterior walls 2) load & pile wood 3) clean chimney flue	Shelter: 1) remove exterior walls 2) secure fireplace from use
West Side of Loop	Install snow protector sheets in open field	Remove snow protector sheets from open field

Develop a Maintenance Program

Arrange the maintenance activities and seasonal requirements into a preliminary schedule for all seasons. Trails that are completely shut down and closed off beyond the operating season need little work done in this down time, however do not omit this from the maintenance schedule. Based on this schedule, decide what tools, equipment, machinery, and mode of transportation are needed, then record this information in the maintenance program. The schedule will assist in determining the number of crews and persons per crew needed to complete the program. Crews of volunteers can be helpful for annual or seasonal maintenance. Local school classes can volunteer as a class project to do uncomplicated tasks. Encourage the community to get involved in a “trail sweep.” A trail sweep is promoted as a day when volunteers gather to tune-up the trail. Usually they are rewarded with a lunch.

Establish an Inspection and Monitoring System

Typically, thorough inspection and monitoring are carried out prior to the heavy-use season. Additional inspection has to be done either periodically or regularly, depending on the kind of trail, the usage rate of the trail, and the nature and atmospheric conditions.

An inspection / monitoring system should outline:

- how many persons will inspect
- who will inspect
- how inspections will be done (see *5.1.4 Methods of Maintenance*)
- inspection standards
- when inspection will occur
- where inspection will occur

An inspection should note any evidence of over-use, misuse, erosion, blowdown, or other potentially unsafe situations, and wear-and-tear on trail surface, structures, and facilities. Monitor things such as the snow condition, ice thickness (should the trail cross a body of water), water level, spring-thaw, fire index, and animal activity. Report these flaws or issues using a recording method that is consistent amongst all persons inspecting. See *5.1.5 Maintenance Records* for further details.

Repairs, Seasonal Preparation, and “Everyday” Maintenance

This stage begins once the trail has been inspected and monitored. For major maintenance inspections (before operating season), this information is prioritized and then maintenance tasks are scheduled and crews are assigned accordingly. The Maintenance Program that has been developed lays the framework for making these decisions efficiently. Everyday (or regular) maintenance such as garbage collection, restroom cleaning, and lawn-mowing need not be outlined in this framework, as these are routine tasks that should be outlined earlier in the Maintenance Program.

Evaluate All Work

Once repairs, changes, and improvements have been completed, someone at the supervisory level will need to evaluate the quality of work against the standards established in the maintenance objectives. Evaluation will ensure that maintenance efforts meet standards.

5.1.2 RESOURCES

Before a maintenance system can be fully developed, you need to know the available money resources and ‘people-power.’ Allocate money in your annual budget specifically for maintenance costs, including tools, equipment, pay, special services, and related materials. Do not let maintenance be an afterthought, for if the money is lacking to do the necessary tasks, the development efforts may be lost over time in a deteriorating trail.

It can sometimes be a challenge to decide what kind of ‘people-power’ to have run the maintenance system. A non-profit group, community group, or a small municipality can be financially limited to less than the ideal ‘people-power’ to perform the maintenance activities. However, this does not mean a group with small pockets does not have choices. Volunteers can be a reliable source of people-power — provided they know what is required or are trained in trail maintenance procedures. Again, depending on what classification and type of trail you operate, the amount of maintenance needed may be small enough that experienced persons could be hired to do the occasional inspections and repairs. Another possibility is to have volunteers complete the inspections and all minor repairs, but contract special services to handle the more complicated trail work.

5.1.3 MAINTENANCE JOBS

Whether the maintenance crew is volunteer or paid, they need to understand the trail purpose and overall objectives and its maintenance objectives, know the trail standards, and be capable of performing the required tasks. Generally there are four jobs in a complete maintenance system: supervising, inspecting, manual labour, and machine and equipment operation. You may assign your crew to do separate jobs or you may have a complete crew that is capable of doing all tasks.

Supervising

Supervising is best as a one- or two-person job. This person may be involved in the other jobs, but has duties beyond the crew's, such as assigning the crew to tasks, ensuring the safety of the crew, reviewing the recorded inspections and work logs, prioritizing and scheduling the maintenance work, ensuring its completion, and evaluating all completed work.

Inspecting

Inspecting involves thoroughly assessing the conditions of the entire trail area and its components (structures, amenities, etc.) and recording all this information. This requires a few people to complete; it is a good idea to have someone who is highly involved and someone who is unfamiliar with the trail to inspect it in order to get different perspectives. See *5.1.5 Maintenance Records* for recording tools.

Manual Labour

Depending on the needs of your trail, there will be minor and/or major physical labour. Minor manual labour are tasks such as pruning trees, removing garbage, replacing light bulbs, etc. Major manual labour are tasks such as moving fallen limbs or trees, replacing a washed-out board on a bridge, etc. Some minor manual labour can be done during the inspection, but most tasks need to be planned (that is, make adjustments after the inspection is completed).

Equipment and Machine Operation

Machine and equipment operation is necessary for regular activities such as lawn-mowing, cross-country track setting, and snowmobile grooming. It is also necessary when extensive damage has been done and extensive improvements or preparations are needed. Machinery is needed for such problems as fallen boulders, flooded trails, intrusive alder-bush, and erosion. Regular activities such as lawn-mowing, cross-country track setting, and snowmobile grooming. Most equipment and machinery needs to be operated by experienced people.

5.1.4 METHODS OF MAINTENANCE

Generally, there are two ways of conducting maintenance work: a master overhaul and periodic servicing. The method you choose will likely depend on the human resources you have available: committed volunteers, occasional volunteers, summer employees, hired contract help, or full-time employees. It also depends on the needs of your trail. The trail organization may do it both ways or one way. It will depend on the trail purpose, standards, users' needs, level of use, activities, funds, people-power, and so on.

Master Overhaul

An annual or preseasonal walk-through is the biggest maintenance project for a trail. It leads to all minor and major construction, repairs, and adjustments. For most trails the walk-through is done in the spring when most maintenance needs are noticeable. Three or more people in a group travel by foot through the entire length of the trail(s). Using an Inspection Survey, the inspection crew assesses and records all maintenance needs for the tread, campgrounds, facilities, structures, etc. Some simple maintenance activities can be done on an assessment walk-through, but typically, maintenance should be done on a separate walk-through, after the Work Logs have been completed. Flag tape or numbered wooden stakes are used to mark where work is needed; these are noted on the Inspection Survey and Work Log for easy reference. When conducting a walk-through, be sure that each person on the crew follows proper safety procedures and precautions.

Periodic Servicing

Certain trails require only occasional tuneups once the master overhaul has been completed. These are ones which have few problem areas, few structures, low user rate, and attract those seeking nature and adventure experiences. It is important to maintain a balance of safety and experience for these trails.

More regular and consistent maintenance is needed for family, urban style, and multi-purpose trails. Some special purpose trails may require that maintenance persons work the trail more frequently. Some snowmobile trails and cross-country trails need a grooming machine operator to regularly tend to the trails. A group the size needed for the master overhaul is not necessary in these cases, because the maintenance activities are usually simple, routine, and known in advance.

5.1.5 MAINTENANCE RECORDS

A Maintenance System is incomplete without the proper tools to record information for inspection, maintenance work, and evaluation. These tools can be either forms or a dictaphone (cassette recorder). Some prefer audio recording because it is easier to take notes. A recorder allows one hand to be free to manoeuvre, where writing notes requires both hands. Recorders are good for those not willing or able to take the time to write key information legibly. Verbal notes can be recorded quickly 'in the field', then transferred and organized on paper later in the office. Carry extra cassettes, batteries, and a note pad and pen for backup.

Although audio recording may be easier at the time, forms are much more beneficial and efficient for the long run. Pre-made forms act as a guide so that the workers remember what to assess or what tasks to complete. Also, forms direct workers to input information that is consistent, relative, and understandable, which, in turn, will make interpretation much clearer for those reviewing the records. Individuals experienced with trail maintenance and familiar with your trail should carefully develop these forms.

Trail Inspection Survey

A trail Inspection Survey is used mostly for the annual and seasonal trail inspection trips (i.e., preparing for the high-use period ahead) to assess both the obvious maintenance needs and specific trail problems. It is ideal to get input from a variety of people: the maintenance crew, trail users, and trip leaders. Infrequent trail users can spot poor blazes and signage, where crews familiar with the trail overlook such details while being attentive to safety and structural details. In general these forms ask for:

- trail name and location
- section of trail
- date of inspection
- inspector's name (each inspector fills out a form)
- conditions and its cause (e.g., vandalism, weather, over-use, poor materials)
- maintenance work accomplished (e.g., "replaced missing flags")
- recommendations for work to be done: the approach (e.g., "replace all shingling" or "replace shingling on leaking section"), extent of task, labour and equipment needed, materials needed
- general comments, proposals, and recommendations

If you involve trail users in the inspection, the form should be geared for them, including opinion sections on topics such as the usefulness of map descriptions, accessibility of facilities and parking, observations at viewpoints, and recommendations. The best layout/design of the form depends on the extent of information desired. The form may

- group trail features together (tread, bridges, rest areas) and have information titles (condition, cause)
- divide groups of information titles for each identified trail feature (each bridge, each rest facility)
- organize check list or matrix system.

There are example forms at the end of this section.

Work Log

A Work Log uses the information from the Trail Inspection Form to specify the maintenance solutions or needs. It is completed 'out of field' using the maintenance system (see 5.1.1) to guide in prioritizing, scheduling, and assigning tasks and listing tools and time needed. A work log needs to include enough detailed reference points and information so that crews are clear about their responsibilities.

Work Report

Work Reports are used to register what maintenance work has been completed. It notes the problem and its location (as identified in the work log), details the tasks and time required for completion, notes the work conditions (boggy, dry), and costs. These are filed according to each trail or section of trail to facilitate future reference. Work reports are mostly for future purposes to:

- help evaluate the efficiency of the work crews and methods
- develop work activity summaries
- monitor work standards
- provide a basis for the next budget
- identify repetitive problem areas.

Evaluation Report

The Evaluation Report is an extra step the supervisor can take to see if maintenance efforts are indeed yielding the desired results. Assess the overall efficiency and quality of the crew, maintenance techniques, frequency of maintenance, cost efficiency, and so on.

5.1.6 CONTROL TECHNIQUES

The trail operator should encourage trail users to contribute to reducing the need for maintenance. A good Maintenance Program is one that outlines proactive techniques that are to be followed by the trail users. Identify policies and regulations that will help prolong ideal conditions of the trail and lessen the amount of maintenance required.

Policies and Procedures

Institute policies and procedures that will protect and benefit your trail facility and its users. The public needs to be informed about these policies through signs, pamphlets, maps, and/or verbal instructions so that they understand what is expected of them. As an example, consider the litter issue: implement a "pack in-pack out" policy. Users must exit with the things they brought into the trail facility, leaving nothing behind. It is essential that garbage disposals are only at the trailhead and other exiting points. Receptacles placed throughout the trail facility only encourage the users to become less responsible for their own garbage. Another example is dog (pet) control. Signs with symbols clearly inform the trail users of the 'keep your dog on a leash' and 'pick up after your dog' policies. Camping can sometimes negatively affect the natural components of a trail. If your trail offers camping opportunities (e.g., backcountry hiking trail), indicate exactly where camping is permitted.



Regulations

Regulations will also aid in controlling the amount of maintenance your trail will require. Both policies and regulations are to be taken seriously, but regulations are supported by penalizing the violators with fines, denied future access, or seizure of license. Do not assume that trail users automatically know the regulations or the consequences for violating them. Typically, a verbal warning will suffice for first time violations, while repetitive violators should bear the penalties. Regulations are included on trailhead information signs, posted in easy sight at trail entry points. Visible and understandable signs should state

- what the regulations are
- who is enforcing them
- what the penalties are.

Refer to *4.1.2 Regulatory Signage*, Section 4. Listed below are examples of regulations that may help you control the maintenance load for your trail:

- permit only the activities/uses for which the trail is intended
- operating times (will reduce vandalism)
- operating seasons (e.g., denied winter access will decrease trampling, meaning less vegetation maintenance in the spring)
- fishing, hunting, and trapping — none or allowable by permit / license only
- prescribe the maximum period of stay at a campsite
- prohibit all extraction of natural features (especially those endangered)
- prohibit removal and defacing of trail property

It is very important that users are made aware or warned of the temporary changes to the trail during maintenance operations. Place signage in advance of and at the maintenance site to notify users about detours, closed trails, closed stairs, machinery ahead, slippery surfaces (e.g., restroom floors), etc. Or consider closing the trail during maintenance, specifically for master overhauls. In particular, redirect trail users away from dangerous maintenance sites.

5.2.1 WINDFALLS

Any trail bordered by vegetation will no doubt have fallen trees, limbs, and debris on the right-of-way or tread. Because these obstructions are unsafe and lead to detouring, windfalls are to be removed as soon as possible. If all fallen material cannot be cleared immediately, at least get rid of dangerous overhanging branches until further work can be done. A few simple cuts to a fallen tree will suffice until it can be removed entirely.

Large tree fallen across ~ Make two cuts to create a gap wide enough so that no part is stuck out onto the trail. Roll the middle section off to the side of trail. This is a temporary solution; move all pieces from the right-of-way when crew and time is available.

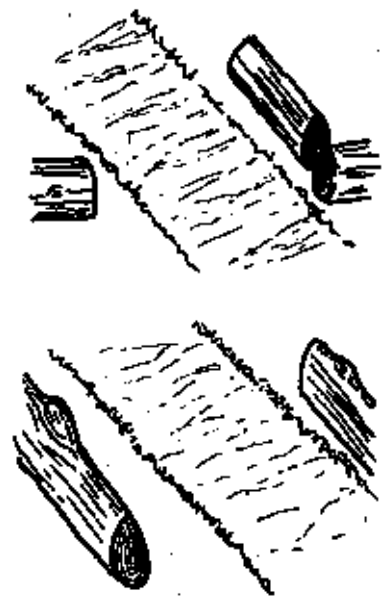
Small tree fallen across ~ Cut once in the middle and set the ends to the side of trail. This is a temporary solution; move all pieces from the right-of-way when crew and time is available.

Tree fallen lengthwise ~ Cut off limbs, cut tree trunk in sections and roll to the side. This is a temporary solution; move all pieces from the right-of-way when crew and time are available.

Uprooted trees ~ Push small stumps back into place and cut flush to the ground. Large stumps are sometimes unpredictably dangerous, so study the tree before making any cuts.

Dead overhead limbs and trees ~ Look up for trees or tops potentially ready to fall or hanging in the right-of-way. It is best to eliminate these before they fall because they could prove to be extremely dangerous to the users below. Use a hand saw to remove. Remember to follow safety procedures and precautions when cutting overhead or felling a tree.

Generally, debris is removed from most trails or it can be scattered out of sight in wooded areas. On Primitive and Countryside trails, it is best to deposit the debris in a pile away from the trail right-of-way to encourage wildlife habitats.



Small tree fallen across

5.2.2 DRAINAGE

Drainage tends to be a difficult thing to control. The direction and velocity of ground water is often unpredictable and the damage it can do to a trail can come as a surprise. You will need to accept the fact in advance that your trail will have some drainage problems. The initial attempts to control ground water in the construction phase may fail; this may mean you will have to experiment until one method succeeds. The first step to solving any drainage problem is identifying the water source. Ground water patterns are not simple to trace, so monitor the patterns in the spring, when water is at its highest level and runoff is busiest. Depending on the drainage situation and the recommended correction, maintenance can be done in the spring/summer or fall. Wet conditions may not permit certain corrections to be made, in which case, the fall would be ideal. This is not to say that a drainage problem is not to be fixed in the spring. On the contrary; it is crucial that damage is repaired immediately, especially for those trails operating in the spring and/or summer.

Look for clogged waterbars and ditches; yearly maintenance will decrease the possibility of flooding. Watch for water running along or across the trail which causes erosion and water standing on the trail and drives users off the tread.

Clogged waterbars ~ To clean clogged waterbars, scrape the organic matter from the ditch parallel to the log (waterbar). Remove the soil and gravel collected in the ditch and pack it behind the bar on the lower side. If the waterbar has loosened or moved, pull it out. Reshape its bed, place it back in, and pack the soil and gravel on the downhill side. Place large rocks or pegs at both ends to hold the waterbar in place.

Clogged ditches ~ These are cleaned the same way as waterbars: clean organic matter and dispose of it away from the ditch. Use mineral soil and gravel from the ditch to build up a gentle slope on the trail tread bordering the ditch. Grade the ditch so that there are no pools of water in it.

Running water ~ Fast moving water has the power to do serious erosion damage to a trail. If the water cannot be diverted with waterbars or ditches, the next option is to slow down its velocity. Rock “steps” hold the soil in place, and slow the water’s speed. Rock “steps” are used on 45° slope or more, or in a gully that runs down the centre of the tread. The rocks are to be wide, with flat opposite sides, and need to weigh at least 91 kg.

Standing water ~ When there is no drainage on a flat area, water collects from rain and runoff ; this is held within the treadway by organic soils and creates mudholes. These areas will become worse even when dry because traffic on the tread compacts the soil and increases its impermeability. These areas will widen as users travel around the sides of the wet area to keep clean and dry.

First, consider ditching as a possible solution for the problem. This will help dry the tread. Some tools needed for digging ditches are: shovel, mattock, grub hoe, clippers, and heavy rake. Dig a ditch following the most direct route from the point where the water first enters the trail across to a distant point downhill from the trail. Make the ditch at least 30 cm deep and 30 cm wide and free from obstructions. For large wet areas, place stable rocks through the wet area and ditch so hikers can pass. Where the trail is soggy due to a series of seeps along the

trail, make a similar ditch parallel to the trail. It should continue as long as there is seepage.

Another possible solution is to harden the trail with stepping stones. The rocks should be at least 91 kg (use a mattock and a prybar to move). Set the rocks flattest side up and at a comfortable stepping distance. If possible, avoid placing rocks on organic soil because the rock will settle. To encourage the soil and vegetation to recover, direct hikers to use only the stepping stones by placing brush at the trail edges. Place a temporary sign to instruct any cyclists to dismount their bikes and walk across stones rather than peddle through. Stones are not the answer to the problem for trails hosting activities other than hiking. You may have to build a bridge or boardwalk if the problem is persistent.

Clogged Culverts ~ Small culverts fill easily with leaves, garbage, earth, etc. Remove this, otherwise more will build on it and eventually the culvert will no longer convey water.

These maintenance techniques may not be suitable for your trail or may only be a temporary solution. These would not be suitable for a wheelchair-accessible trail, a biking trail, or an urban trail. If your trail is one of these you will need to repair any damage immediately with the best medium. You may need to repair or replace the medium that is already being used or find an alternative. A medium may not work simply because it was not installed properly. Perhaps the technique is correct but it just needs to be brought to a higher standard. For instance, a corduroy made by setting logs side by side may be upgraded to a corduroy with reinforcing stringers.

5.2.3 SURFACE TREATMENT

The trail tread usually requires a considerable amount of attention as it becomes eroded and impacted. Damage is undeterminable because the climactic and geological conditions can drastically change from year to year. General treatment includes raking and regrading gravel, soil, or wood chips to maintain an even surface. Add surface material where there are dips and bare spots. Dry, well-drained areas tend to stay intact; damp areas do not. Check the drainage situation at eroded spots first before resurfacing; your efforts will be wasted if there is a drainage problem.

High user traffic can wear the surface, causing ruts and exposed subsurface, in which case, the subbase needs to be reworked and new surface material added. Sand, twigs, leaves, and pebbles should be swept from hard surfaces for the safety of participants with strollers, wheelchairs, in-line skates, and bikes. Winter's frost heaves may break up the tread; replace with patches of the same material and avoid using tar to fill cracks (it sticks to soles in heat).

Tread treatments greatly depend on the trail type. A snowmobile trail does not need the weeds removed from the tread, but does rely on 'Mother Nature' to provide enough snow to groom a trail.

5.2.4 NEW GROWTH

Every spring new growth in the right of way must be cleared in order to meet the requirements (or standards) established when the trail was built. It is easiest to do this in the spring or summer when new growth is young and soft. Probably the most persistent growth is bush. Using pruners or loppers, cut branches flush to the stem or trunk. Manicured trails call for regular grass mowing along trail and campsites. Find an alternative to herbicides for killing weeds and other pesky growth because herbicides are destructive to the environment.

5.2.5 STRUCTURES

Inspect stairs, bridges, boardwalks, railings, look-offs, restrooms, shelters, and benches for safety and stability. Check the tightness of nuts and bolts and watch for rotting or weak wood. Immediately replace missing, broken, or damaged parts. Test the supporting structures for bridges and boardwalks. Paint or stain structures to keep a pleasant appearance and guard against rot or rust. Repair vandalism promptly to prevent any further damage.

In restroom and shelter buildings, make sure things are in working order. Check for the following:

toilets that flush	windows that open, shut, and lock
running water	doors that open and shut
locks that work	accurate thermometer
clean chimney	firewood
cleanliness	foul odours

Be careful not to overlook the small structures. Do the fountains work and is the water still fit for consumption? Are the ski racks or bike racks fastened securely to the ground or building? Are the benches and picnic tables in good condition? Are the light fixtures working or do the bulbs need to be replaced?

5.2.6 LITTER REMOVAL

Arrange for garbage to be picked up on a regular basis to avoid unsightliness, foul odours, and scavengers. This may mean daily pickups for high-use facilities or every few weeks for low-use facilities. Sanitize the garbage bins twice a year or as needed. Consider having a “pack in-pack out” policy to reduce the frequency of garbage collection.

5.2.7 CAMPSITE SERVICING

Cut and remove new plant growth, and dead or diseased trees that affect the campsite. Restock firewood supplies as needed. Mow grass if applicable to trail type and eliminate poison ivy. Rework the tent pads about twice a year, so they do not become compacted. If there are signs that show campers have set up tents beyond the allocated space, place big logs along the edges.

5.2.8 GROOMING

Not all, but many snowmobile or cross-country ski trails are groomed. Grooming for both trails requires special equipment, experienced operators, proper timing, snow conditions, wind, and air temperatures. The goal is to obtain a firm uniform snow base and a powdery surface. Large commercial groomers compress the snow when roughly 30 cm has fallen and with each new 15 cm. Build from the bottom up (after every 15 cm) rather than from deep snow or else it will not compact uniformly. Groom wet snow at night and dry snow in the day, preferably at temperatures between -20°C to -9°C for snowmobile trails and -7°C to -4°C for ski trails. Between snowfalls you will need to condition the snow. Conditioning is a process in which a milling action at high velocity creates friction, which produces heat. This heat is needed to add moisture to the snow so that tracks can be set for skiing or the trail can be levelled for snowmobiles. Ski tracks are made with a tracksetter (or mould) towed behind a snowmobile.

Trail Inspection Survey

Trail Name: _____ Location: _____
Section: _____ Length: _____
Inspector's Name: _____ Inspection Date: _____

Be sure to remember to reference the location of the feature corresponding to the mark on-site.

General Trail Site

Condition & Cause: _____
Recommended or Completed Correction: _____
Materials & Equipment: _____

Right of Way

Condition & Cause: _____
Recommended or Completed Correction: _____
Materials & Equipment: _____

Tread

Condition & Cause: _____
Recommended or Completed Correction: _____
Materials & Equipment: _____

Bridges

Condition & Cause: _____
Recommended or Completed Correction: _____
Materials & Equipment: _____

Stairs

Condition & Cause: _____
Recommended or Completed Correction: _____
Materials & Equipment: _____

Culverts

Condition & Cause: _____

Recommended or Completed Correction: _____

Materials & Equipment: _____

Campsites

Condition & Cause: _____

Recommended or Completed Correction: _____

Materials & Equipment: _____

Drainage

Condition & Cause: _____

Recommended or Completed Correction: _____

Materials & Equipment: _____

Please comment on the accessibility of facilities, trail surface, parking, views, effectiveness of signage, speed limits, policies, difficulty rating, or anything else you'd like to comment on.

Observations & Comments:

Work Log

Trail Name: _____ Trail Location: _____ Section: _____

Flagged Reference: _____ Location Description: _____

Condition Definition:

Assigned Correction:

Standard:

Season: _____ or Beginning Date: _____ Completion Date: _____

Estimate Completion Time (or Output per hour): _____

Crew Size: _____ Crew's name: _____

Crew Worker's Names: _____

Tools & Equipment:

Work Method:

Other Details:

Crew Supervisor's Signature: _____ Job Completed on: _____

5.3.1 CARRYING CAPACITY

Carrying capacity is the maximum number of users that a trail can accommodate over a period of time without having problems or consequences. An example of a consequence is the loss of atmosphere or experience; an example of a problem is degradation of the trail and its environment. The carrying capacity quota and its reasoning is based on trail type. A primitive trail offers a remote experience, so there is a small capacity. A low capacity is set because the primitive experience is in an uncivilized or a natural setting and protected environment; if too many people use the trail, they will affect the setting/environment. A multi-use trail in a municipality has a high carrying capacity because it provides recreational experiences for everyone. Such a trail is not as much concerned with affecting the trail's environment as it is with the safety of the users.

It is not always the case that the carrying capacity will be exceeded on a regular basis, but it does happen. The number of users on a primitive, countryside, or special purpose trail can be regulated with a registration policy that allows a certain amount of people per day. An urban or multi-use trail may need to specify when or where certain activities can occur.

5.3.2 USER-TRAFFIC FLOW

It is important to encourage order in traffic on a trail for the safety of the users. Trails attracting numerous people or multi-use trails need the traffic managed. A crowded trail that lacks traffic direction confuses and frustrates participants, which in turn, makes for unpleasant recreational experiences. Also, when speed is involved (activities other than hiking/walking), it puts users in jeopardy.

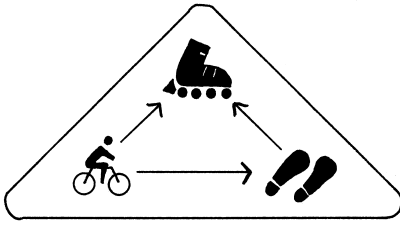
The methods of managing traffic are simple.

Set a circulating direction

On a one-lane trail (one-way) send all the users in one direction (however, not really appropriate for linear layout). On a two-lane trail (two-way) designate each side for opposite direction. Or, when there is more than one activity each lane could be used for specific activities (often, urban trails do this).

Times

Set times for when certain activities are permitted. Some municipal park trails use a method of allowing bikes only on weekdays to eliminate fast traffic when the trail is busy with walkers.



Yield Etiquette

Yield Etiquette

Inform users who is to yield to whom. This is important at junctions, for oncoming traffic, and when a user might pass from behind or adjust her speed. People approaching others from behind and wishing to pass shall yield to those they are passing. For concurrent activities specify the yielding connection between each. The arrow indicates who yields to whom in this example.

Regulations and Signage

Set regulations for speed, directions, permitted uses, permitted times, and areas of use. Make these regulations known with signs (and with policing if applicable).

Design

Traffic management really begins in the design of the trail. A trail that is harmonious with the users and activities will have traffic flow. Factors such as trail width, right-of-way, signage, layout, multi-use design, curves versus linear stretches, barriers, difficulty, and sight distances all contribute to traffic management.

5.3.3 INTERSECTIONS

In some situations trail routes cross a roadway or railway. The best thing to do is to stay clear of intersections because they place users and motorists in danger. If the trail must cross, do not do so at a random location. Do not make an intersection at the base of a downhill trail because the user's speed should decrease, not increase, on approach. Avoid crossing at a curve in the road because the drivers' sight distance is too short.

Situate the trail at 90° angle to the road. The section(s) approaching the road should be straight and have no more than a 5 % grade. Post a warning sign on the trail 30 m before the intersection and a stop sign at the intersection. A dodgeway or bollards are recommended for the two trail ends that meet the roadway.

5.4.1 REGULATIONS FOR TRAIL USE

The ideal trail would have no rules to follow — everything and everyone would be harmonious. What a true outdoor recreational experience it would be! Of course, there is a “but” to add to this statement: But, the fact is, rules and regulations are necessary. Some trails will have more rules than others and rules that are prioritized differently. Nevertheless, these regulations are what benefit the safety of the trail users and secure the future existence of the trail.

Establish regulations in writing to make them official. State the rules of conduct and what penalties will be imposed. Regulations concerning the following topics may be applicable to your trail:

- approved and unapproved uses
- speed limits
- open and closed times or seasons
- trespassing adjacent land
- loitering
- trail etiquette (yielding, etc.)
- unauthorized entry to closed area
- theft
- danger, unsafe conditions & warnings
- treatment of animals & environment
- camping
- campfires
- traffic flow
- littering
- vandalism
- hunting & fishing
- removal of natural elements
- fees and membership
- parking
- carrying capacity

If the trail is designated under the Trails Act, then many of these regulations are already stipulated and enforceable.

Of course regulations are not limited to this list of subjects, others may arise in unique situations. Some of these topics will apply to your trail; others may not. And some will need to be enforced more than others. The trail should not be in operation until regulations are in place. You will find that, over time, the regulations will need to be modified or new ones added as unforeseen situations emerge.

These rules are made known with signage and/or persons assigned to enforce them (see 5.4.2 *Security*). Certain regulations are easily expressed with symbols and/or simple words, while some regulations need to be explained in detail. Compare the two situations at right.



The CAMPING fee is \$8.50 each night per party (up to 6 people).

Camping is permitted only at designated camping sites.

Please register at entrance.

5.4.2 SECURITY

Trail operators are responsible for monitoring the behaviour and actions of trail users. This is for the security of all trail users, landowners, adjacent landowners, the environment, and the trail itself. The security of these components means a bright future for the trail.

One of the greatest concerns and a cause for anxiety among adjacent landowners is the fear of increased criminal activity or loitering. They want to know how the trail will be policed. You must share with them a plan for supervising activity and ensuring that trails do not attract criminals. Trails do not increase crime or necessarily bring crime to the area. Chances are, if a vandal wants to trespass on someone's property they will do so regardless of whether a trail is developed or not. This is not to say that crime will never occur, but it will be rare provided preventive measures are employed. In fact, most often the only "laws" broken are when people fail to comply to the trail's regulations such as speeds, cutting paths, and so on.

Security Alternatives

The solution to security does not rely only on official policing. Few trails are regularly policed by their own security people: It is pointless for many trails, when much of the job of policing is to control access. Controlling access means regulating who enters the trail site, when and how they enter (approved means of travelling versus unapproved), and for what purpose they enter. Having read through the manual, you will have some sense of how to control access. Here are some security measures you can follow:

- Regulations* This is the first and most important means of security. Develop regulations and policies to govern the trail and consider any disciplinary actions to be enforced. In these regulations, address the concerns not only in the interest of the trail but in the interest of other parties (i.e., adjacent landowners, landowners). For example, if home owners at the perimeters of an urban trail are concerned about people loitering after dark, then have opening and closing times. Address disciplinary actions such as "trespassers will be prosecuted." Regulations and disciplinary actions must be made known.
- Signage* Regulations are made known with regulatory signage. Display regulations in greater detail at trailhead(s) and in short, to-the-point messages on signs along the trail at appropriate locations. People tend to be either consciously or unconsciously selective of the signs they read and ignore. Therefore if regulations are to be taken seriously, signs must command attention by colour and placement. People are more likely to comply to regulations that are positively worded; be authoritative but not militant. Sometimes the user questions a rule with "why" or "why should I," then, failing to find an answer, chooses to ignore the rule. When the rationale for a rule is obscure, give the reason (e.g., "Do not enter field. Rare wildflowers.").

<i>Barriers</i>	Barriers are effective in keeping both unwanted user groups and troublemakers away from the trail. Place them where the trail meets a roadway, logging road, and other undesignated trail access points.
<i>Participants</i>	Generally, most trail users look out for the good of the trail, especially if they take pride in it (this all goes back to having a supportive and involved community). Some will compensate for others' ignorance (e.g., put trash in its place) and report their suspicions (e.g., vandals or wrongdoers). Some will correct wrong-doers. At the trailhead's information sign, tell the people how they can report their suspicions or sightings.

Policing

Policing, or patrolling, is the final option for most cases. Not only is it usually unnecessary, it is not conducive to outdoor recreational experiences. Trail users enjoy trails because they can distance themselves from civilization's order. Trails in larger towns do have arrangements with the city police to patrol the trails by car, bike, foot, or horse. Security patrol is used more for some snowmobile trails and very busy multi-purpose trails. Snowmobile clubs tend to have patrollers to slow snowmobilers travelling at excessive speeds, monitor trespassers on adjacent land, and check for membership. Patrollers on busy multi-purpose trails are mostly concerned with accident prevention; they ensure that the traffic flow is orderly and expel users participating in unapproved activities.

Patrolling is done by volunteers and requires a number of them to rotate the duty. Volunteer trail "police" or "security" enforce the rules and regulations as stipulated for the trail. They have no legal authority, but a simple uniform may be all that is needed. Designate patrollers with reflective vests and "trail patrol" (or something of the like) printed on the back and front. Most people associate such a title and uniform with legitimate authority. This presence of a visible "authority" is often enough for users to abide by the rules and regulations, simply because they know someone is watching.

The trail operation should try to establish a relationship with police (municipal or RCMP) and wardens of the Department of Natural Resources. These authorities will be in vicinity of the trail site on occasion. Have them become familiar with the trail and its regulations, and give the offices maps of the trail. Ask them if they are willing to "keep an eye out" for wrong doers. Also inquire about crime watch programs and get the trail involved, since it is part of the neighbourhood.

5.4.3 LITTER CONTROL

Where people roam, their presence is evident in the garbage they leave behind. There are two ways to guard your trail from garbage mess; either have garbage bins or have none. Yes, this is right, no garbage bins. It is called "pack in-pack out" or "carry in-carry out" and many trails find this method successful.

The “pack in-pack out” policy means that the user must leave the trail with everything he/she came with. All materials (plastics, wrappings, cans, paper, etc.) brought into the trail facility must also exit the trail facility. This method is most often used where there is low to medium use, such as primitive and countryside trails. The trail regulations should state the conditions of the “pack in-pack out” policy. Make the policy known with signage at the trailhead(s). Perhaps reminders posted along the trail would prove to be useful. For these signs use more creative and personal statements rather than command statements. Try one of these or create another:

“Please take nothing but pictures. Leave nothing but footprints.”

“You are amongst some of the most beautiful nature our province has. Only you can keep it that way.”

“Respect our hosts and their home. Clean up after yourself.”

[Include a drawing of the local animals in their habitat]

Do not place garbage bins anywhere along the trail as this confuses the users, resulting in a nullified policy. An exception to this rule is the option of one bin at the trailhead, so when users return they can discard their garbage. This is necessary for those people travelling and not returning to their home. If there is a brochure, state that the “pack in-pack out” policy is in effect, because people will need to appropriately prepare their bags.

Of course, the second option is to include garbage bins within the trail facility at the trailhead, picnic areas, rest areas, viewpoints, shelters, and at intervals along the trail. Some people tend to throw garbage in water with the idea of ‘out of sight, no problem.’ Their reasoning is a) the garbage is not on the trail, it’s in the water, b) it will sink, it cannot be seen, and c) it will decompose. Trail operators must do what they can to protect water that is accessible to trail users. To avoid the risk of contaminating the water, keep the bins at a distance from the water’s edge.

Include separate bins (blue bins or green bins) for recyclable materials. What materials can be accepted will depend on what is recycled in the municipality. At the very least, drink containers can be recycled, as the province has a refund program for these. What an easy way to raise a few extra dollars!

Bins with covers are ideal because they hide the clutter, contain the odour, and keep pesky scavengers away. Garbage must be emptied and removed regularly; have a maintenance plan in order.

All the garbage bins you can gather are not enough to stop some careless people. Consider enforcing a consequence for their carelessness like denying them future access to the trail. Also garbage may escape the bins and will blow around the trail environment. Plan “trail sweeps,” in which a day is scheduled for volunteers to help clean up the trail. If there is good community support for the trail, it should not be too difficult to find helpers. Young children are usually eager to help — involve a youth group or a school in the project.

5.4.4. Risk Management

Some element of risk is inherent in virtually all outdoor recreation activities. The element of risk is often part of the reason people participate in the activity (snowmobiling, cycling, nordic skiing, hiking, riding on horseback, etc.). As a trail developer/manager, it is important that you balance the safety with the risk so that you don't injure the adventurer but don't kill the adventure.

There are a number of steps you need to go through so that you can fully appreciate and manage the risks appropriately:

1. Assess all of the risks that are inherent in the delivery of your trail. What is the treadway like? Are there roots and rocks sticking up or does it come very close to a cliff? Is there enough headroom for snowmobiler and horseback riders? Who else uses the trail, what are their needs, and how compatible are they? If you are designing a trail from scratch, take into account trail design features required for each particular use.

This is only a partial list to get you thinking along the correct vein.

2. Identify which of the risks need to be managed and which don't; which present a real danger and which present only a small or apparent danger.
3. Determine how you are going to address the risks that need to be managed. If your trail goes near a cliff, what kind of railing do you need and how and when are you going to install it? If your trail is multi-use, what signage and other considerations are needed to ensure a safe experience? What kind of maintenance schedule are you going to set up and what expertise is required to do it? There is always the risk of being sued if you are negligent, so part of your risk management plan needs to include liability insurance.
4. Crisis Management! Accidents happen. Do you have an emergency action plan to deal with accidents on the trail or drastic changes in the trail due to misuse and/or weather?

This is a brief overview of how you should consider managing the risks inherent in operating a trail. You and/or your group should consider attending a seminar offered by the Recreation Facilities Association entitled Risk Management Training for Activities and Facilities. It can be a three-hour or six-hour process. For further information, contact RFANS at 425-5450 or P.O. Box 3010 South, Halifax, N.S. B3J 3G6.

5.5.1 PROMOTION ACTIVITIES

After so much time and hard work have gone into developing and managing a trail, it is easy to forget to promote it. Promotion is not always a necessity. The organization will have to decide whether promotion is important or not, and to what extent it will be done. This decision is determined by the trail purpose, objectives, and the classification of the trail. A trail developed for members' use only need not be promoted because its users are identifiable through club membership. But a historic walking trail through a town should be promoted to visitors as an attraction that will stimulate tourism. You may want to limit awareness of the trail to selected users to protect the experience, the environment, or the trail itself. Or you may wish to inspire the entire community to be more active in outdoor recreation. Those that charge user fees to cover maintenance costs are more likely to keep the trail in operation. If your trail is to turn a profit then a marketing strategy is necessary.

Promoting a trail is mainly a way to attract people to participate. Other advantages follow.

- With greater public awareness and knowledge of the trail, community support grows.
- Increased community support can lead to contributions after the trail is complete.

People are quick to assume that there are few costs to cover once the project is complete. Indirectly, promotional events can make them aware of continuing need for funding. As you will see below, some promotional events are quite similar to fundraising activities. It is best not to mix these completely separate purposes in the same event. As an example, perhaps it is not best to hold a cross-country run competition to profit from registration and admission fees and promote the trail at the same time. The two messages, “we request your contribution” and “we urge you to use the trail” mix into one confusing message that loses the desired results.

There are different ways to promote a trail. Here are some possibilities to consider:

- *Conferences*
Participate in recreation and tourism conferences by facilitating a session or have a booth displaying photos and information on the trail and organization.
- *Displays*
Set up a display in a local mall or visitor information centre.
- *Opening Ceremonies*
Hold an official opening of a new trail.

- *Trail Activity Events*
Hold a mountain biking race, ski competition, bird identification, etc.
- *Interpretative tours*
Publicize an educational tour of railway history, berry picking, etc.: mention the facilitator's name
- *Bicycle Parades*
Organize a day when children can decorate their bikes and show them to other children and onlookers.
- *Contests*
Hold a contest in the community for the best design of a trail logo.
- *Clinics*
Ask skilled people to hold hands-on educational clinics on such topics as primitive hiking and camping trips.
- *Media*
Newspaper/magazine articles featuring the trail. Public service announcements.

Your choice of these will depend on who you are targeting. A conference will help make people aware of the trail in the business community, such as recreation directors and accommodation owners. These are key people who can in turn promote your trail by word-of-mouth and distribute brochures. A bicycle parade targets young families and encourages repeat visitation to the trail.

5.5.2 PAMPHLETS AND BROCHURES

Devote attention to developing pamphlets and brochures for your trail. A brochure is a promotional tool used to encourage people to select your trail, usually focusing on the trail's best features. It also gives quick and easy information about where the trail is and how to get there. A pamphlet contains more detailed information to facilitate the use of the trail. Primarily it is intended to be used by people already participating on the trail. The brochure is descriptive, decorative, and persuasive whereas the pamphlet is mainly descriptive, factual, and informative.

Pamphlets

Too often pamphlets are thrown together and the result is a useless piece of paper. For someone spending so much time in developing a trail, it is easy to overlook important matters with which participants are unfamiliar. Gear your thoughts to those of a person introduced to the trail for the first time. Ask yourself, 'what do I need and want to know before beginning this trail?' Once you have identified a list of answers, add topics in the interest of the organization. These topics are concerned with management matters (e.g., regulations, emergency routes) and interesting information (e.g., trail's history).

The text should be creative and interesting yet concise and comprehensible. Use common dialect and not lingo that others find unfamiliar and confusing. Inexperienced trail users and persons speaking a second language appreciate this. Include some graphics, pictures, or drawings to complement the text. Be specific; do not be vague, because a pamphlet is often the only guiding tool for users. Naturally, users assume they can rely on the resource to be true and sensible.

Strong paper is better than flimsy paper, which tears easily. The pamphlet should be durable yet pliable enough to fit in the user's pocket. Paper less than 8.5 in. x 14 in. cannot hold all the information required for a thorough pamphlet. This size is ideal for a short trail, whereas 11 in. x 17 in. or 14 in. x 17 in. is ideal for a larger or full trail ("full" meaning "many components and features worth noting").

The front page includes the trail name, operator's name, major sponsor's name (or logo), and trail location. Include the trail's logo or a drawing/picture of a predominant or remarkable feature. The reader should be able to know from the cover what sort of trail it is. This is done with either words or pictures. These words and pictures can be incorporated into the trail name and logo or kept separate.

In example A, the trail name incorporates the sort of trail. It tells the reader it is a wilderness hiking trail.

Example B tells the reader it is a wilderness hiking trail, however, not through the trail name, but a descriptive statement.

Inside the pamphlet is where the core of information is. It should contain:

- trail operator's name, address, and phone number
- directions and distances to the trail from the closest town(s)
- regulations
- degree of difficulty
- accumulative length of all trails in the trail system
- accumulative completion time of all trails in the trail system
- approved and unapproved activities
- what to bring and wear
- hazards and warnings
- description of what is available (e.g., view, animal sighting, picnic areas, etc.)
- trail map and regional map

Optional information for the pamphlet:

- sponsors' names
- description of features
- description of the trail's progression (e.g., "After the dam, the trail goes uphill along the river bank and ten minutes later you will see a waterfall...")
- explanation of history, wildlife, geology, etc.
- pictures or drawings

**The Resna Cove
Wilderness Foot Trail**

Example A

The Resna Cove
A leisurely walk through
unique coastal wilderness

Example B

Trail Maps

The trail map is the most used information of a pamphlet. Because trail participants often rely on a map (in combination with signs) to orient themselves, it needs to be accurate, clear, and detailed. Actually a pamphlet requires two separate maps. The primary map is of the trail route and surrounding area. The second map is a small inset to the primary map that highlights the trail site within a region.

The primary map should be drawn to scale and the scale measurement line included. Show the northern direction with an arrow. Print names of bodies of water, streets, roads, communities, and mountains. Accurately trace the trail route on the map. Print the route names and distances along the trail between distinct points (e.g., junctions). Using symbols, show the location of:

- points of reference
- lookoffs
- features of interest
- access points
- roads and railways
- facilities and amenities
- private property
- emergency routes and telephones
- trail boundary
- parking
- restricted areas
- main buildings or facilities (school, shopping centre, sport fields)

Use a legend to explain what the symbols represent.

Brochure

A brochure is an invitation to the trail for persons having little or no previous awareness of it. A brochure paints a mental picture of what users can expect. Descriptive and persuasive wording depicts what they will see, hear, smell, and feel, and the kind of experience possible if they participate. It mentions the trail's assets in attractions, facilities, services, special features, history, wildlife, geology, tree and plant life, landscape, and community. At least one tasteful photo or drawing is beneficial. People are less likely to pick up a brochure with only text.

Certain basic information needs to be included on the brochure:

- trail name and logo
- operator's name and address
- kind of trail and length
- where to find more information
- trail location
- simple regional map showing location and major roads for access to the trail and towns for reference
- distance and direction to the trailhead

Your brochure should not be lengthy, therefore, it need not be larger than 14 cm x 21 cm (5.5 in. x 8.5 in.). A brochure is only a quick-read for the basic information. Pamphlets and other resources (e.g., booklets, published books) go into greater detail once the user has devoted more interest or is ready to participate.

Brochures are distributed to places where potential trail users are. The extent of this distribution depends on the trail purpose. For instance, a primitive trail that is to accommodate a small number of users need not have brochures in many locations. Actually, in such a case, your organization may decide to attract people only by word of mouth, not by promotional tactics. As another example, a special purpose trail used solely for serious mountain bikers will not benefit from brochures displayed everywhere. Instead they should target mountain bikers at places such as biking clubs, associations, and bicycle shops.

For those trails that gladly welcome visitors, go for a widespread distribution. Not everyone benefits from word-of-mouth information (i.e., tourists, newcomers) so they appreciate printed resources. Display brochures at places such as tourist information centres, shopping centre kiosks, outdoor equipment and rental stores, service stations, convenience stores, public libraries, and nearby accommodations.

Brochures are necessary if you wish to attract tourists to the trail. It is beneficial to seek consultation from a tourism association or bureau about how to make the brochure attractive to tourists and which distribution avenues are best. These people know who visits Nova Scotia and what their spending and interest patterns are. They provide a perspective from the tourism industry to those organizations who mostly have knowledge about recreation.