



The Town of The Blue Mountains
Appendix A: Trail Standards

TRAIL DEVELOPMENT STANDARDS

1 WALKING AND MULTI-USE

1.1 Walking/Hiking Trails

- i) Suitable Locations: Buffer areas, and natural environment areas such as woodlots, wooded or narrow valleys, where environmental constraints exist; rural to semi-rural areas where low usage is anticipated (<5000 users per year).

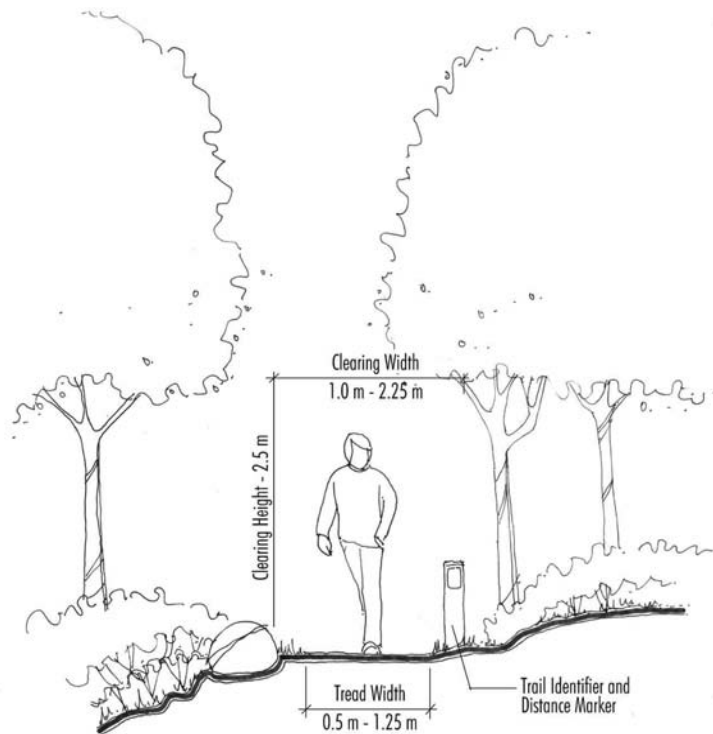


Figure A-1: Walking/Hiking Trail Cross-section

- ii) The following design standards shall apply (Figure A-1):
 - Clearing width: 1.0 m minimum – 2.25 m
 - Tread width: 0.5 minimum - 1.25 m
 - Clearing height: 2.5 m respecting sensitive vegetation.
 - Surface: Compacted limestone fines or natural base
 - Grades: The trail is to match the natural terrain as much as possible to minimize environmental impacts. 0-20% with maximum sustained grades of 25% for short distances with regard for erosive slopes and sensitive embankments.

- iii) Construction Standards
 - Excavation Depth: 300 mm
 - Options of excavated materials considered by Town Staff
 - Removal of excavated materials
 - Use of excavated materials remove from site or can be used as shouldering in some areas
 - Use of Landscape Cloth/filter cloth placed under B gravel width of trail
 - Size/colour/granular make up of “B” Gravel White
 - Depth of Subbase of “B” Gravel 150 mm
 - Size/colour/granular make up of Limestone 9 - mm White
 - Depth of Limestone 150 mm
 - Compaction requirements 95%
 - Warranty provided by Contractor two Year maintenance program
- iv) Trail width and surfacing shall be determined based on-site specific conditions. Low use walking/hiking trails and trails through sensitive natural environment areas (where approved) shall be based on minimum widths to minimize environmental impacts. In areas of lesser environmental sensitivity, parks, or close to residential areas where higher usage is anticipated, wider tread widths and granular surfaces may be used.

1.2 Multi-Use Recreational Trails

1.2.1 Non-Motorized, Low Impact Trails

- i) Suitable Locations: Broad, open valleys and floodplains; dry woodland areas; buffer and setback zones adjacent to environmental areas; natural parks; in close proximity to residential areas where walking and limited seasonal cycling uses are anticipated and/or permitted.

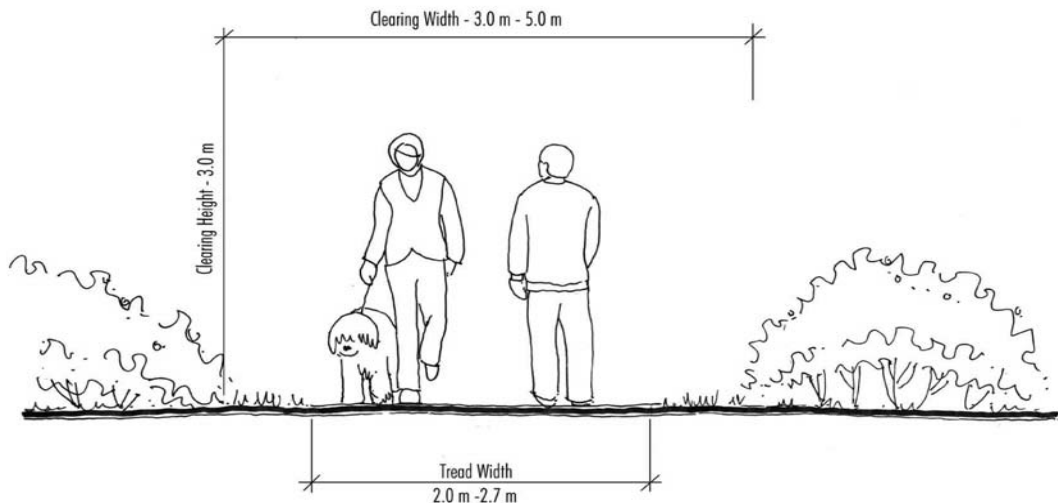


Figure A-2: Low Impact Multi-use Trail

ii) The following design standards shall apply (Figure A-2):

Clearing width: 3.0 – 5.0 m

Tread width: 2.0 – 2.7 m. Wider minimum tread width in areas where cycling is anticipated.

Clearing height: 3.0 m.

Surface: Compacted limestone fines. Can be upgraded to asphalt should use increase to >500 users per day.

Grades: 0-5% with maximum sustained grades not exceeding 10%.

iii) Construction Standards

Excavation Depth: 300 mm

Options of excavated materials considered by Town Staff

Removal of excavated materials

Use of excavated materials Remove from site or can be used for shouldering in some areas

Use of Landscape Cloth/filter cloth Installed under B gravel

Size/colour/granular make up of “B” Gravel 50 mm white

Depth of Subbase of “B” Gravel 150 mm

Size/colour/granular make up of Limestone -9 mm white

Depth of Limestone 150 mm

Compaction requirements 95 %

Warranty provided by Contractor two-year maintenance program

1.2.2 Non-Motorized Multi-use Trail

i) Suitable Locations: Roadway boulevards, urban parks and greenways, broad open valleys and floodplains or buffer areas without significant environmental constraints, where moderate to high levels of use are anticipated including all season cycling and rollerblading. Areas where full accessibility is a consideration.

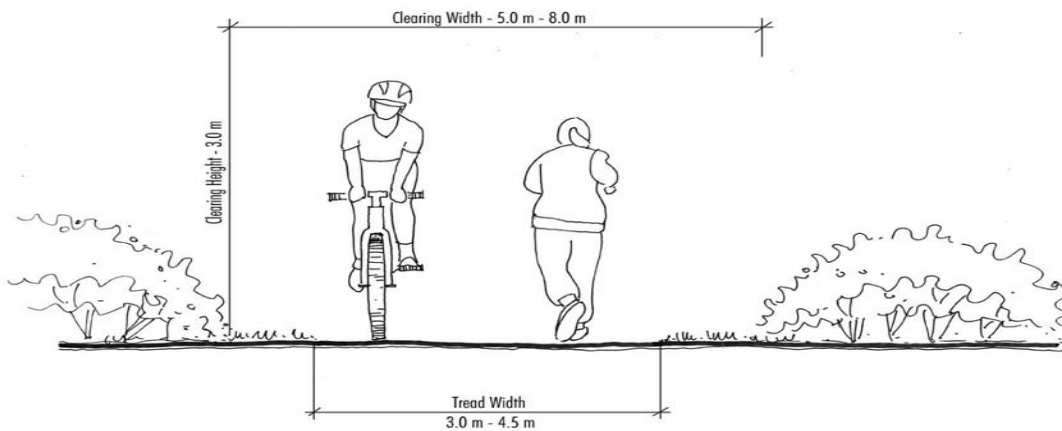


Figure A-3: Non-Motorized Multi-use Trail

ii) The following design standards shall apply (Figure A-3):

Clearing width: 5.0 m – 8.5 m

Tread width: < 500 users/day = 3.0 m.

>500 users/day = 4.0 to 4.5 m.

Clearing height: 3.0 m

Surface: Limestone, Asphalt, or concrete

Grades: 0-3% with maximum sustained grades of 6 %

iii) Construction Standards

Excavation Depth: 300 mm

Options of excavated materials considered by Town Staff

Removal of excavated materials

Use of excavated materials removed from site or can be used for shouldering in some areas

Use of Landscape Cloth/filter cloth placed under B gravel width of trail

Size/colour/granular make up of “B” Gravel 50 mm white

Depth of Subbase of “B” Gravel 150 mm

Size/colour/granular make up of Limestone -9 mm white

Depth of Limestone 150 mm

Compaction requirements 95 %

Trails that are intended to accommodate cycling and in-line skating shall avoid

Warranty provided by Contractor two-year maintenance program

ii) blind corners, sudden grade changes or steep slopes terminating at path to path or road or path intersections. Also, additional tapered path widening should be provided on the inside of significant curves.

- iii) Where steep grade changes occur on an approach to a roadway, a switchback shall be provided.
- iv) Signs shall be provided indicating changes from one trail type to another (non-motorized multi-use to motorized multi-use trails). Users not permitted shall be re-routed to other trail routes or to staging areas where motorized trail riding equipment can be loaded onto trailers.
- v) Pathways should be designed with a minimum 2% cross-slope for stormwater runoff. This slope should be lower on the inside of any curve for greater cornering safety. Swales will be required on the uphill side of paths to reduce hazards on the path and maintain its structural integrity.
- vi) Grades on multi-use paths should be kept to a minimum, especially on long inclines. Grades greater than 5 percent for paved surfaces and 3 percent for unpaved surfaces (E.g., crushed stone), are undesirable because the ascents are difficult for many cyclists to climb, and the descents cause some cyclists to exceed the speeds at which they are competent. However, terrain dictates, grades over 5 percent and less than 150m long are acceptable when a higher design is used, and additional width is provided. It is recommended that a minimum of 0.5 percent be used for proper drainage. Routes with steep grades should be assessed by the designer to ensure that the prevailing conditions fit the type of cyclists expected
- vii) Trails built over watercourses should have 2.0 mil galvanized culvert with 100 mm gabion stone in wire baskets installed at both ends.

2.0 AMENITIES AND INFRASTRUCTURE

- i) A system of trailheads and amenity areas should be provided within the trail system. Facilities such as car and bicycle parking areas, washrooms, drinking water, and trail information signage should be provided at major trailheads along the Georgian Trail. Adjacent or close by public facilities such as community centers/school/Library should be employed wherever possible. Collaboration with private landowners (e.g., industrial/ commercial sites, Community Service Clubs) should also be sought where no public facilities exist. Facilities that are located away from the trail system should be identified on any trail mapping (signs, or route maps), as well as through directional signs along the safest route. Mounting blocks for equestrians, both natural and wheelchair accessible should also be provided. Many areas along The Blue Mountains Trail System already have parking and a few have washroom facilities. In such locations only the addition of signage, site furniture and perhaps washrooms will be necessary.
- ii) Community access areas and rest stops should be located at strategic points along the trail system. The location and design of these minor trailheads should consider public safety and accessibility for maintenance. Facilities might typically include seating, bike racks, waste receptacles and trail route signs. For ease of maintenance, where trails are non-drivable, these facilities should be provided at trailheads, access points or look-out areas that are externally accessible. Figure A-8 illustrates how a minor trailhead could be developed.
- iii) Additional facilities along the the trail systems will vary depending on locale and trail type –
i.e., benches and lighting may be desirable for trails within a park setting, while not appropriate for more secluded walking/hiking trails.
- iv) Bike parking racks shall be encouraged at all destination points (parks, shopping areas, public facilities). Additionally, they shall be located at access points to walking-only trail segments to ensure appropriate trail use.
- v) At a minimum, bicycle racks shall be of a design that permits use of steel U-locks for secure locking of one wheel and frame, (both wheels for bicycles equipped with quick release front wheels) and must support the bicycle above the axle. These types of facilities are best suited to short term use in busy areas. More secure bicycle facilities that permit the bicycle frame and both wheels to be locked without removing a wheel should be considered for longer term parking or areas where there is little pedestrian traffic (e.g., day hiking areas). Key-access bicycle storage lockers or security yards should be considered for areas where long term parking is anticipated.
- vi) Litter receptacles shall be provided for all urban trails, with consideration of access by maintenance vehicles and animal problems. Signage directing trail users to carry out garbage, coupled with provision of receptacles, including recycling, at trail access points shall be provided for non-drivable trail segments.

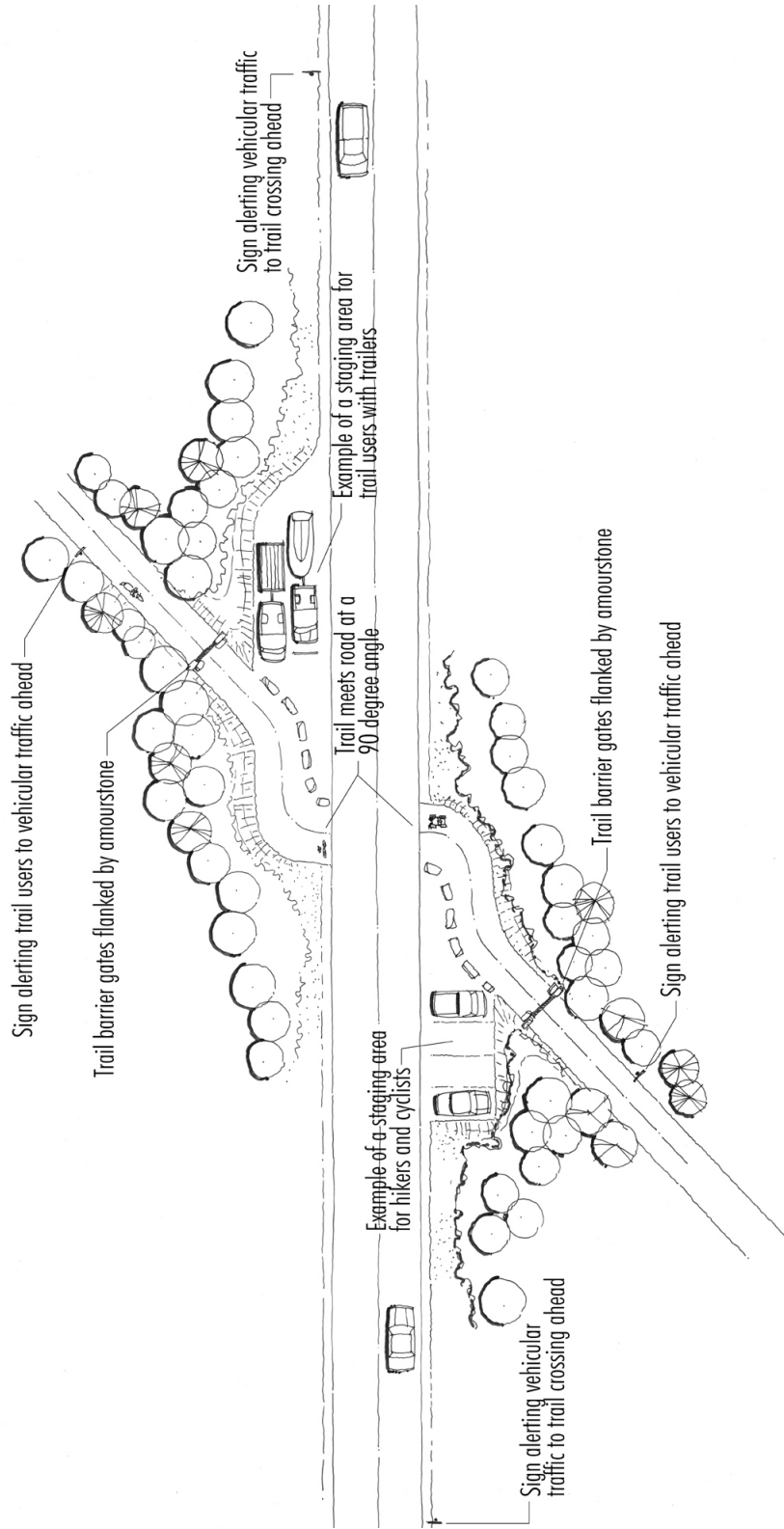


Figure A-8: Example of a possible Trailhead Layout at a road intersection

4.1 SAFETY AND SECURITY

4.2 Lighting

The lighting of trails is governed by municipal by-laws concerning hours of use in parks, as well as safety concerns. The following are considerations when determining whether trails are to be lit.

- i) Cyclists are required to have a front light and reflectors when cycling on roadways at night and one-half hour before sunset and one-half hour after sunrise.
- ii) Lighting of trails presents an illusion of safety and should not be used in remote areas, where safety concerns exist. Where the trail is visible from adjacent streets, residences or other well-used areas, lighting of urban greenspace trails, particularly those connecting to transit nodes, may be appropriate.
- iii) Trails to be lit shall provide consistent lighting, avoiding areas of darkness, and ensuring both horizontal (pathway, obstacles, and pavement markings) and vertical illumination (signs, approaching cyclists and visibility to motorists). If the path contains hazards such as sharp turns or concealed slopes, the illumination levels should be higher.
- iv) Higher illumination levels shall be provided in tunnels and at intersections with streets for a distance of 25m.
- v) Metal halide and high-pressure sodium lamps are typical light sources, chosen for high efficiency, high quality light and long lamp life. High pressure sodium is frequently recommended for lighting pathways, however facial identity and colour rendition may be less distinct, creating a feeling of insecurity for pedestrians.

4.3 Roadway Crossings

- i) Sightlines should be open far enough along the road to gauge how fast traffic is moving at non-signalized crossings.
- ii) Signage should be provided along the roadway to alert motorists to the trail crossing ahead.
- iii) Stop Signs should be provided along the trail to alert users of roadway junctions.

4.4 Vegetation Management

- i) Vegetation planted adjacent to trails shall be located to prevent low hanging branches and protect sightlines, particularly at curves and hills.
- ii) Periodic inspection and trimming of trees and vegetation shall be undertaken to ensure trail safety and to maintain minimum clearing widths.

4.5 Awareness

- i) For trails in secluded locations, i.e., through valley corridors, signage should be posted at trailheads and entrance points noting the remoteness and distance to the next access point.

5.0 TRAIL SIGNAGE SYSTEM

- i) Signage for The Blue Mountains trail system should be designed as a comprehensive family of signs with a consistent identifying graphic style, image, or trail logo. The following general guidelines apply to all signage types.
 - consistency of design and graphic communication.
 - clarity in conveying the desired message to a range of users, from adults to children.
 - vandal and weather resistant materials.
 - of a size and design that is clearly visible and understandable to the targeted trail user, i.e., cyclists vs. pedestrians.
 - compatibility with surroundings, in use of colour, materials, size and placement.
- ii) Signage should be designed to address general trail information, regulatory and directional information, and interpretation/education.

5.1 Trail Identification/Information Signs

- i) These signs would be provided at major trailheads and key access points, and could include:
 - trail identification including trail name, trail identity logo and Town of The Blue Mountains information. Trails that are components of a larger regional system (i.e., Beaver River Trail) should also carry the logo of the parent trail.
 - trail route map (at trail heads and road crossings), showing trail loops and distances, degree of difficulty, and any notable hazards such as steep slopes.
 - In addition to trailblazer signs posted along road routes, pocket route maps are an essential to aid planning of trip length and gauging skill demand and difficulty. The pamphlets should be placed at trail heads in waterproof clear plastic containers affixed to the overall route sign for easy, visible access.
 - trail user code of conduct.
 - notice board for promotion of trail related events or activities.
 - areas for patron recognition or sponsors.
 - trail management contact information.

5.2 Directional Signs

- i) Directional signs should be located at trail junctions and access points throughout the system, directing users to nearby facilities or other trail routes, and may include:

- trail system logo, styling and colours compatible with trail information signs.
- trail name and/or distinctive logo, distance marker and directional arrows.
- simple post markers with graphic or colour coding that identify the trail or trail loop and correspond with an overall route map at trailheads or on brochures.

5.3 Regulatory Signs

- Regulatory signs display prohibitive information, warnings, and cautions. Areas where these signs may be needed include natural areas where access is discouraged; potential hazard areas (e.g., steep slopes, or bridges) and changes in trail type (e.g., multi-use to walking trails). Temporary trail closures due to conditions, wildlife considerations or environmental restoration should also be signed.
- Regulatory signs should be designed as part of the overall signage system, using compatible styling; however, the message should be easily recognized from a distance (e.g., international symbols, visible colours). Use of metal signs and posts typical of roadway signs is a cost-effective design.
- Prohibitive information should include brief, informative explanation with reason for the restriction, encouraging co-operation, and noting whether the situation is temporary or permanent.

5.4 Interpretive/Educational Signs

- These signs may be used in conjunction with a themed trail, or special feature areas along the trail. Trails may be developed on themes of wildlife and natural ecosystems, landscape, or cultural heritage. The information presented should be both interesting and informative, and in natural areas, be oriented to building stewardship and responsibility for environmental management.
- Interpretive/educational signs should be located within a widened trail node, at viewing locations or rest areas, to allow for unimpeded use of the trail.
- Sign design and construction may vary according to the trail setting or storyline. A consistent design should be used within each trail loop, and each sign series should be compatible with the overall Town of The Blue Mountains trail system identity.
- The presentation of information should be suited to a wide range of users, including adults and children. The message should be both interesting and informative, oriented to educating trail users.

6.0 NATURAL ENVIRONMENT PROTECTION AND RESTORATION

- Perimeter fencing or a buffer planting of thorny or prickly native species, (e.g., raspberry) may be required to deter access through sensitive areas or to block random trail routes.
- Periodic/seasonal closures or re-routing of trails may be necessary to prevent permanent damage or to allow regeneration of the woodlot understory.
- Wherever possible trails should be located above the regional storm flood line.

- Through narrow valley conditions or constrained areas, outside the 5 yr. flood line to reduce maintenance and reparation costs. Through underpasses this criteria may not be met. Temporary closure of trails during spring runoff or extended wet periods may be required.
- iv) In undefined creek valley corridors where minimum setbacks of 15 m (warmwater streams) and 30 m (cold-water streams) define the open space corridor, flood lines may not delineate the setback requirements. In these instances, adequate setbacks from watercourses should be provided for all trails to allow for riparian planting. A setback distance of 5-10 meters is preferable with a minimum distance of 3m through constrained areas.
 - v) Riparian buffer strips shall be established adjacent to all stream courses that will assist in sedimentation control, erosion protection and filtration of runoff from adjacent paths. All work within these zones shall be in accordance with Ministry of Natural Resources and Conservation Authority requirements.
 - vi) Development of new facilities such as trails, bridges, etc. should be undertaken with minimal disturbance to existing vegetation and without loss of stream corridor function or aquatic habitat, (e.g., the use of longer span bridges, natural stone rather than gabions within the stream channel).
 - vii) Restoration in riparian areas should include native species that have a high tolerance to flood conditions with deep or wide-spreading root systems to bind soil and reduce erosion (Refer to Table A-3). Aquatic habitat enhancement should be considered through the planting of species that overhang and shade the stream bed.
 - viii) Construction within stream corridors shall be undertaken during the season when the stream is least sensitive (generally summer), and with the least impact on fish or wildlife habitat.
 - ix) Landscaping within and adjacent to natural environment areas should avoid invasive, non-native species. A predominance of native species should be used with an emphasis on species that are indigenous to the local conditions, as determined through field assessment and use of available data. (e.g., Ecological Land Classifications for Southern Ontario, Ministry of Natural Resources). This practice should also be encouraged on private lands. Refer to Tables A-3 and A-4 for plant lists suitable for use in natural area restoration.

TABLE A-3: TYPICAL RIPARIAN ZONE PLANT COMMUNITIES

Source: Hough Woodland Naylor Dance, Gore and Storrie, September 1995. Restoring Natural Habitats: A Manual for Habitat Restoration in the Greater Toronto Bioregion. Prepared for the Waterfront Regeneration Trust.

River and Stream Edge Species	
Speckled alder (<i>Alnus rugosa</i>)	Elderberry (<i>Sambucus canadensis</i>)
Gray dogwood (<i>Cornus 13acemose</i>)	Highbush cranberry (<i>Viburnum trilobum</i>)
Red osier dogwood (<i>Cornus sericea</i>)	Canada plum (<i>Prunus nigra</i>)
Virginia creeper (<i>Parthenocissus quinquefolia</i>)	Flowering dogwood (<i>Cornus florida</i>)
Chokecherry (<i>Prunus virginiana</i>)	Pussywillow (<i>Salix discolor</i>)
Tree Species	
Red maple (<i>Acer rubrum</i>)	Silver maple (<i>Acer saccharinum</i>)
Green ash (<i>Fraxinus pennsylvanica</i>)	Black walnut (<i>Juglans nigra</i>)
Cottonwood (<i>Populus deltoides</i>)	Trembling aspen (<i>Populus tremuloides</i>)
Bur oak (<i>Quercus macrocarpus</i>)	Peachleaf willow (<i>Salix amygdaloides</i>)
Black willow (<i>Salix nigra</i>)	Eastern white cedar (<i>Thuja occidentalis</i>)
White willow (<i>Salix alba</i>)	Basswood (<i>Tilia americana</i>)
White elm (<i>Ulmus americana</i>)	Bur oak (<i>Quercus macrocarpus</i>)

TABLE A-4: WOODLOT PLANTING SPECIES

Source: Restoring Natural Habitats: A Manual for Habitat Restoration in the Greater Toronto Bioregion. Hough Woodland Naylor Dance, Gore & Storrie Ltd., September 1995. Prepared for the Waterfront Regeneration Trust.

Woodland Edge Species	
Serviceberry (<i>Amelanchier canadensis</i>)	Bittersweet (<i>Celastrus scandens</i>)
Gray dogwood (<i>Cornus 13acemose</i>)	ush honeysuckle (<i>Diervilla lonicera</i>)
Pin cherry (<i>Prunus pennsylvanica</i>)	Chokecherry (<i>Prunus virginiana</i>)
Staghorn sumac (<i>Rhus typhina</i>)	Shrub roses (<i>Rosa sp.</i>)
Flowering Raspberry (<i>Rubus odoratus</i>)	Red raspberry (<i>Rubus strigosus</i>)
Snowberry (<i>Symphoricarpos albus</i>)	Red osier dogwood (<i>Cornus sericeae</i>)
Elderberry (<i>Sambucus canadensis</i>)	Highbush cranberry (<i>Viburnum trilobum</i>)
Nannyberry (<i>Viburnum lentago</i>)	Canada plum (<i>Prunus nigra</i>)
Salt Tolerant Species for Road Edges	
Poplar (various) (<i>Populus</i>)	Aspen (<i>Populus tremuloides</i>)
White ash (<i>Fraxinus americana</i>)	Chokecherry (<i>Prunus virginiana</i>)
Staghorn sumac (<i>Rhus typhina</i>)	

7.0 TRAIL ADVOCACY AND EDUCATION

- i) Public awareness and education are of paramount importance in responsible trails use, reduction in user conflicts and the prevention of environmental damage and should be part of the marketing and promotion of recreational uses in natural areas.
- ii) Partnerships with trail associations, school environmental groups and community organizations should be encouraged for revegetation and planting programs, trails development (e.g., walking trails), and garbage clean-up, through such programs as Adopt-a-Park and Adopt-a-Trail.
- iii) Barriers (log fences or plantings) may be necessary to restrict access to trails or sensitive natural areas.
- iv) Reduced mowing strategies and naturalization can be perceived by the public as neglect, and the use of these areas through recreational trails may draw additional attention to these issues. Informative signage will increase public acceptance of such measures. Natural areas that lie immediately adjacent to housing may require a higher level of maintenance to alleviate public concerns, such as mowing strips adjacent to fences.

8.0 MANAGEMENT AND MONITORING

- i) The recreational benefits derived from the use of the natural corridors for trails and other passive uses must be carefully balanced with the potential increase in impact on the natural environment. Monitoring of these developed natural areas will be important in ascertaining the successful integration of recreation with ecological objectives.
- ii) Routine trail maintenance should include monitoring for environmental damage, (e.g., twice yearly when mowing is done). Input from trail users and local residents should also be solicited. Specific areas of concern include:
 - Destruction of understory vegetation and slopes as a result of trail breaking, “hang- out” areas, mountain biking, etc.
 - Destruction of trail surfacing by prohibited uses.
 - Creekbank erosion and destruction of riparian vegetation as a result of public access to the water’s edge.
 - Encroachment into natural areas from adjacent land-uses. The presence of public trails within buffer zones and natural areas, which are accessible to city maintenance staff may reduce the occurrence of environmentally detrimental activities such as dumping, expansion of gardens, etc.

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Table A-1: Summary of Unit Costs

Improvements	Width (m)	Description		Costs \$
Shoulder Paving (one side)	1.5	Asphalt over existing gravel shoulder (as part of road reconstruction)	km	
	1.5	Asphalt over existing gravel shoulder (individual contract)	km	
	1.5	Surface treated existing gravel shoulder	km	
Hiking Trail	1.25	Wood chip	km	
Multi-Use Path (non-motorized)	2.5	Stone dust	km	
	3.5	Asphalt	km	
	3.5	Upgrade Stone dust to Asphalt	km	
Multi-Use Path (Rail Trail)	3.5	Stone dust (grading, re-surfacing over existing base)	km	
Signs and Pavement Markings		Cycling Route sign installed on existing post	ea.	
		Cycling Route sign installed on new post	ea.	
		Trail Crossing Signs (Trail)	ea.	
		Trail Crossing Signs (Road)	ea	
		Trail Marker Signs	.	
		Regulatory Signs	ea	
		Trailhead Kiosk Sign	.	
		Interpretive Sign	km	
		Bicycle symbol on pavement	ea.	
	Line painting – 6 lines	km		
Trailhead Amenities		Lockable Gate	ea	
		Armourstone blocks	.	
		Granular Parking Lot (3 car capacity)	ea	
		Granular Parking Lot (6 car capacity)	.	
		Granular Parking Lot (12 car capacity)	ea	
		Trailhead Kiosk Sign	.	
		Benches	ea	
		Trash Receptacle	.	
	Bike Rack	ea		

Table A-2: Distance Calculations

Trail Segment	Approximate Length
Bayview Park Trail	680 Meters
Beaver River Trail	10 km
Heathcote Park Trail	610 Meters
Lora Bay Trail	1.2 km
7th Line Trail	1.8 km
Camperdown Road Trail "North"	700 Meters
Delphi Point	460 Meters
Georgian Trail	26 km
Peasmarsh Conservation Authority Trail	640 Meters
Alpine Trail	620 Meters
Alta Trail	1.4 km
Craiglieth Meadows Trail	2 km
Drakes Path	210 Meters
Heritage Walk Trail	300 Meters

Table A-2: Distance Calculations (cont'd)	
Nipissing Ridge	2 km
Summit Green Trail	120 Meters

