

Integrated Master Plan for Trails on the Western Side of Bedford Basin

Report and Mapping

prepared for the
Halifax North West Trails Association



by
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in association with
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Halifax North West Trails Association

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1.0 Introduction

1.1 Background

Study Area

The Halifax North West Trails Association (HNWTA) commissioned Gordon Ratcliffe Landscape Architects and Griffiths Muecke to prepare an Integrated Trails Master Plan for an area of HRM encompassing three Council districts and part of a fourth district on the western side of Bedford Basin. These districts include a significant diversity of urban, suburban and near-urban wilderness land uses, with a collective population base approaching 75 000 people.

- ***District 15*** includes the established neighbourhoods of Fairview and Clayton Park connecting through to the Northwest Arm along Joseph Howe Drive (Armdale).
- ***District 10***, together with ***District 15***, includes the Mainland Commons area, Bayers Lake Business Park and newer residential areas Glenbourne and Clayton Park West. Each of these areas is a blend of single family dwellings, townhouses, condominiums and apartment blocks, some of it higher density neighbourhoods and commercial facilities. The most recently developed areas generally have the higher tax base.
- ***District 16***, a much larger area, includes a significant length of Bedford Basin shoreline, the established Rockingham and Kearney Lake Road and Clayton Park neighbourhoods, some very recent residential construction (Royal Hemlocks), MSVU Motherhouse lands, HRM's Hemlock Ravine, and the Blue Mountain-Birch Cove Lakes (BMBCL) Regional Park.
- ***District 21*** (part of) this includes a portion of the older community of Bedford, a high growth area near Paper Mill Lake, Bedford Basin shoreline, Bedford South growth area; all south of Hammonds Plains Road, and proposed Bedford West area.

HRM Trails Master Plan

The trails master plan contemplated for this study area would be the first strategic trails planning to have been initiated close to HRM's urban core. The original HRM trails master plan, completed in 1997, dealt mainly with existing and potential multi-use trail corridors in more rural areas. Subsequently, in 2001, a trails master plan was commissioned for the Chebucto Peninsula. Most of the other trails planning has focused on individual projects in the urban setting. Therefore, this project has potential to be a model for other urban areas.

HRM Regional Plan

The Integrated Master Plan for the Halifax North West Trails study area must be understood in the context of the recently tabled HRM Regional Plan.

"The Regional Municipality Planning Strategy is a guide for the future development of the Halifax Regional Municipality (HRM). It is a framework that outlines how sustainable growth should take place in the HRM over the next 25 years, in a way that preserves the environment while at the same time maintaining a strong economy. The overarching goal of this Plan is to achieve a shared vision of the future of HRM, a vision of healthy, vibrant and sustainable

communities, without taking away from the character that makes HRM a distinct and attractive place to live."¹

Trails are a key component of the Transportation section of the Regional Plan as increasing vehicular traffic necessitates reduction and diversion of vehicle use favouring Active Transportation Planning². The Regional Plan includes provision for community groups to influence and implement decisions. Community Trails groups like the HNWTA are in a position to engage effectively in the planning process through studies like this one. (see section 7.5 of this report, Trails and the Planning Process).

Trails are important in the Halifax North West Trails study area for the following reasons:

- multiple health benefits for all ages
- recreation
- outdoor education
- preserve urban ecology and natural corridors
- strengthen neighbourhood social fabric
- meet the high demand for trail facilities and walkable/ bikeable communities
- natural and cultural heritage
- new economic opportunities
- improve overall quality of life
- active transportation routes to school (although not highlighted in this report)

1.2 Study Goals and Objectives

Study Goals

Enhance existing trail facilities and identify new opportunities, prioritized according to demand, populations served, environmental impact and comparative ease of implementation.

Study Objectives

- identify existing trails
- identify trail problem areas and recommend solutions
- identify new trail opportunities and priorities
- preserve opportunities for trail development in a rapidly developing area
- recommend standards and procedures to guide trail development

¹ Regional Plan. Halifax Regional Municipality. pg. 1. April 25, 2006

² Regional Plan. Halifax Regional Municipality. pg. 74. April 25, 2006

2.0 Consultation

2.1 Methodology

The consultation process involved the following steps:

1. start-up meeting with HNMTA
2. community charette
3. meetings with:
 - GISS manager
 - HRM planners and trails coordinator (John Charles)
 - Halifax West High School students
 - EDM Ltd.
 - HRM parkland planners: Stewart MacMillan, Therese Delorme
 - Friends of Hemlock Ravine
 - area Councillors
4. ground truthing/ field study
5. CAD/GIS mapping
6. working sessions with HNMTA
7. Open House
8. report production/ review by HNMTA

2.2 Approach

Identification of existing trail networks, options for expansion and key priorities were achieved efficiently through consultation with the community and the use of consultants' "out of the drawer" experience based on numerous master plan and individual trail projects completed in HRM.

A trails planning charette in early February, attended by 40 people, drew on collective knowledge and ideas of key people identified in consultation with HNMTA, HRM and other key contacts.

Key study area information (commercial, education, and recreational nodes and other trip destinations; boundary connections; environmentally sensitive areas; future development locations etc.) was compiled by desktop means and field work to represent the existing network and all identified options.

A review of relevant existing planning tools in HRM relating to trail development was carried out in consultation with HRM staff, followed by a brief "best practices" scan of selected Canadian municipalities. The selection was made in consultation with HRM staff, the Halifax Regional Trails Advisory Team (HRTAT), and organizations such as Go For Green and the Canadian Federation of Municipalities.

A working session with HNMTA and other key individuals was convened to develop a list of key evaluation criteria, using issue and priority input from the charette, and applying the criteria

to the long list of opportunities. This information was also used to develop priority Recommended Top Projects strategy (see section 8.0).

The project team prepared display materials and handouts and collected feedback from the public at an Open House organized by HNWTa and attended by 45 people.

The Master Plan Report (this document) was prepared and provided to HNWTa to be used in future trails planning work and to assist HRM with future planning and development agreements.

2.3 Issues

Key issues identified in the consultation process include:

- lack of preservation of greenways and open space in rapidly developing communities
- lack of sidewalks and pedestrian traffic planning
- accommodate diverse needs (youth, seniors, mobility challenged, dog walkers)
- disappearing nature, biodiversity
- erosion of public land base
- cost of trail development
- inferior trail construction and maintenance
- lack of pro-active trail planning strategy, policy and management, standards and knowledge base
- lack of trail/walkway inventory with HRM GIS, and other mapping
- lack of adequate funding for trails development
- need for better communication between the various levels of government and private interests
- declaration of BMBCL as protected wilderness area

Developing suburban and urban trails can be very challenging compared to more rural trails which can often utilize old railway corridors or crown land and face far fewer hurdles in the form of high construction costs, multiple road crossings with high traffic volumes, potentially high levels of trail usage and many adjacent private land owners with safety and nuisance concerns.

Slow progress on such projects as the Bedford-Sackville trail link and the Halifax Urban Greenway project is a testimony to this challenge. However, there is a high demand for trail facilities and more walkable /bikeable communities. Trail development can produce multiple benefits in terms of health, recreation, outdoor education, environmental sustainability, new economic opportunities, and overall quality of life.

3.0 Land Ownership and Environmentally Sensitive Areas

Figure 1 shows land ownership and environmentally sensitive areas in the study area.

3.1 Land Ownership

Most recreational trail development in HRM (and in other municipalities) has occurred on public lands. Trail development open to public use can occur on privately-owned land but this involves legal and management agreements which can be challenging and time consuming. In order to plan for trail development in the study area, it was necessary to first identify the areas of public land. Figure 1 shows the land currently owned by HRM and the Province of Nova Scotia. Due to the rapid pace of development and without a regional plan, there are very few contiguous corridors of undeveloped public land to consider for trail development. In many locations, the only opportunity to develop trail connections will be through the utilization of highway and road rights-of-way and utility corridors. However, developers must be approached in new agreements to ensure useable land is considered for trail use.

3.2 Environmentally Sensitive Areas

Environmentally sensitive areas were determined based on criteria developed by EDM³ in their study of the Blue Mountain-Birch Cove Lakes wilderness to establish the Regional Park Boundary, produced in March 2006. Key factors in identifying environmental sensitivity are: water protection, riparian buffer zone, wetlands, species richness, rare species, old forest and core wilderness areas.

In such a large area, relative environmental sensitivity must be defined within a variety of urban, suburban and natural contexts. The Blue Mountain-Birch Cove Lakes area is a significant natural resource, providing habitat for diverse species and access to wilderness close to an urban centre. Although safe access is lacking it also contains the only canoe / portage loop near the city.

Belchers Marsh, although surrounded by high density development, is also a significant resource both in terms of educational opportunities and as a site for natural habitat and storm water management within the suburban landscape. Due to engineering deficiencies, the latter function can be problematic after heavy rainfall.

In order to protect their integrity, environmentally sensitive areas will require protection from development and ongoing management. This will be possible where these areas occur within government-owned land. But, as shown on Figure 1, there are many environmentally sensitive areas within privately-owned land under consideration for development (see Figure 2). These areas will require special consideration in development planning and the negotiation of development agreements. This is especially important in the area north of the Hemlock Ravine, Royal Hemlocks and in the Bedford South and West development areas.

³ Environmental Design and Management Ltd. Blue Mountain-Birch Cove Lakes Assessment Study. March 2006
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Highlighted environmentally sensitive areas include:

1. Blue Mountain-Birch Cove Lakes undeveloped and core wilderness area
2. Mainland Common (low-land/ bog areas)
3. Hemlock Ravine Park
4. Belchers Marsh (adjacent to stormwater management area, Langbrae and Parkland)
5. Old Coach Road (under development in Bedford South, erosion, slopes)
6. Royal Hemlock development areas (lakes and drainage courses, erosion, osprey nest)
7. Bedford West development area (river and drainage area)

4.0 Planning Context

Figure 2 shows the planning context for the Halifax North West area. This includes HRM planning, transportation and trail priorities as well as proposed private development. This Figure also shows key destinations within the study area.

4.1 Active Transportation Plan

HRM's goal is to "create a well-connected, safe and functional Active Transportation Plan that involves input from the general public, community trail groups and active transportation advocates."⁴ The HNMTA study focuses on neighbourhood connectivity and localized recreational uses, leaving the larger scale Active Transportation Planning to HRM. However, in the context of the Integrated Master Plan, it is important to recognize the role of AT corridors and to ensure they are linked to community and parkland trail systems and key destinations.

Existing and proposed AT corridors in the study area:

Beechville Lakeside Timberlea (BLT) Trail-adjacent community group

The abandoned rail line has been converted to a trail from the St. Margaret's Bay area. The remaining rail line through Bayers Lake Business Park to the Lakeside Industrial Park has been recently declared surplus and is now under consideration for conversion to trail. The proposed trail route will extend through the Fairview overpass and connect to the Halifax Urban Greenways Association (HUGA) project near the Armdale Rotary.

Bedford Waterfront

The Bedford Waterfront corridor plays a key role in the Active Transportation Plan connecting Bedford/ Sackville through to the peninsula along the Bedford Highway. This route is being considered primarily for commuters but will also have high recreation potential. An HRM study of the western shore of the Bedford Basin-Mill Cove to Tremont Drive, is currently in progress.

Linear Trail

The connection from Bedford/ Sackville to Long Lake Provincial Park utilizes the existing, well used, Linear Trail as a proposed route for an AT corridor. The exact route is not determined due to several challenges including crossings for Highway 102, and Highway 103, and concerns over the use of power corridors as trail routes. The consultant's advice, based on best practice research, is that alternatives to utility corridors should be considered but, where no other alternative exists, utility corridors are acceptable as trail routes.

Larry Uteck Boulevard

A proposed AT route, to be built when Larry Uteck Blvd. is completed, might serve as a corridor from Royal Hemlocks (Starboard Drive) and Bedford South to the Bedford Highway, as a connection from Highway 102.

⁴ Halifax Regional Municipality Active Transportation Plan. August 2005
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4.2 Blue Mountain - Birch Cove Lakes Regional Park

Regional parks are passive recreation areas that preserve the natural environment (other examples include Hemlock Ravine, Mainland Common and Long Lake Provincial Park)⁵. The Blue Mountain - Birch Cove Lakes Proposed Regional Park is located on the western border of the study area, between Bayers Lake Business Park and Kearney Lake. When implemented this park will be Canada's largest urban wilderness park with an area of 4,000 acres of undeveloped land, lakes, forest, barrens and wetlands and canoe route⁶.

4.3 Development Areas

It will be important to integrate trail development and the preservation of environmentally sensitive areas with future private development. In some cases (e.g. Paper Mill Lake, Bedford) the development process is too far advanced to negotiate trail routes. In other cases (e.g. Bedford South and West), there should be opportunities to establish trail corridors and protect environmentally sensitive areas in the detailed planning of new development. HRM planners have acknowledged that the mapping of existing and proposed trails, key destinations and environmentally sensitive areas will provide a useful tool for communication and negotiation with private developers. Areas that are not yet at the planning stage must be monitored for future trails opportunities. These include Upper Sherwood Park, the Motherhouse lands, and Regency Drive.

⁵ Halifax Regional Municipality (Real Property Planning). "Park Planning and Development Guidelines". April 2005

⁶ EDM Birch Cove Lakes Proposed Regional Park study, March 2006
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5.0 Integrated Master Plan

The Integrated Master Plan (IMP) is a map representing all existing and proposed trails, relevant information compiled in the consultation process. The following list is an outline of all the features portrayed on the IMP map (see Figure 3):

- key destinations
- existing trails
- development areas
- proposed AT corridor
- existing trails walking routes and key sidewalks
- existing and proposed rails to trails
- proposed trail routes and new sidewalks
- proposed trails routes to be determined by future study
- areas requiring detailed study and trail planning
- Blue Mountain-Birch Cove Lakes Park boundary (proposed)

Table 1 illustrates the characteristics, challenges and opportunities related to each of the major existing trail areas.

Trail Area	District	Location	Characteristics	Challenges	Opportunities
Mainland Common	10	Clayton Park West	woodland, suburban wetlands, barrens	lack of current planning resources	multi-use, recreation, outdoor education, interpretation
Belchers Marsh	10	Glenbourne	suburban, wetland, stream, woodlands	poor construction, high demand maintenance	outdoor education, passive recreation
Blue Mountain - Birch Cove Lakes	16	west of Hwy 102	wilderness, canoe routes	safe access points, Hwy 102, fragile ecosystems	regional park plan, better access, conservation
Linear Trail	10, 15, 16	Clayton Park West, Fairview	power line right of way	unattractive, poorly maintained, high demand, lack of street crossing	neighbourhood connector, local stewardship /beautification, outdoor education

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Trail Area	District	Location	Characteristics	Challenges	Opportunities
Mill Cove	21	Mill Cove waterfront	suburban walkway	no sidewalk on bridge	better crosswalk and sidewalk
Paper Mill Lake	21	Bedford	suburban walkways	crossing traffic, lake access, future development	passive recreation, local non-motorized service access
Hemlock Ravine *	16	Rockingham	woodland, ravine, sensitive area	Environmental sensitivity, future development post Juan remediation spruce longhorn beetle heavy use, dogs storm drainage, erosion	woodland access, natural heritage passive recreation, remediation, interpretation
Old Coach Road (in progress)	21	Bedford South	woodland, slopes, wetlands, sensitive areas, cultural heritage	retain features, avoid erosion and habitat loss	links new neighbourhoods, interpretive trail

Table 1: Characteristics, Challenges and Opportunities for Existing Trails

* Friends of Hemlock Ravine are working closely with HRM
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6.0 Best Practices in Trails Planning, Design and Development

The Best Practices research consists of two parts – a review of key elements of Crime Prevention Through Environmental Design (CPTED), and an examination of trails planning as undertaken in selected Canadian cities.

6.1 Crime Prevention Through Environmental Design (CPTED)

The principal source of information for the CPTED research was the Vancouver Design Centre for CPTED (www.designcentreforcpted.org). The Centre is a non-profit organization that provides resources for CPTED design and concepts, and compiles research on environmental criminology.

The fundamental challenge of applying CPTED principles to the design of outdoor spaces is to balance the reduction of criminal activity with other objectives of good design so that the quality of the built environment is enhanced for its users. The starting point of this process is a careful analysis that differentiates between ‘fear of crime’ and actual crime. Fear is often misplaced or unfounded, and can lead to poor decisions, whereas good research can identify where criminal activity is occurring and can support the use of design to reduce it.

Criminal activity usually follows a pattern. Consequently, before embarking on a CPTED design process, local police should be consulted so that the designers can understand the actual patterns of crime (or nuisance) in a neighbourhood. The design response should then be selected in a full understanding of the nature of the crime – for example increased lighting can encourage undesirable activities such as drug taking, but decrease others such as breaking into cars.

An equally important element in the CPTED approach is to encourage watching/guardianship. Guardians include people who regularly use an area (or path) as well as those who overlook it. They will often report undesirable activity and thereby discourage it by drawing attention to it. In an area with a high risk of criminal (nuisance) activity, however, guardianship alone may not be enough to ward off problems. In these instances, other security measures such as formal surveillance or patrols may be needed.

Crimes such as mugging and robbery require a number of elements to be present:

- A high risk population likely to offend
- The presence of vulnerable targets
- A high number of targets
- A poor sense of guardianship over space
- Opportunity for offender to escape easily

Where guardianship is a problem at night, paths may be closed. If the route is an important communication link between one place and another, for instance, between a bus stop and a housing development, it may be necessary to provide an alternative route for use after dark. Overall, thoughtful design incorporating a CPTED principles, approach can provide attractive public spaces that promote safety by using subtle design techniques rather than overt security measures that may generate public discomfort and discourage usage.

6.2 CPTED – HRM Tools, Approaches and Recommendations

HRM has no specific policy in place regarding the application of CPTED principles, but the Community Response Team reviews individual situations on an as-needed basis. Many staff members have been trained to undertake audits. When a particular situation is brought to their attention, staff review the background and conducts an audit which includes a review of local crime statistics. The audit examines the complaint and the situation in the context of five key CPTED concepts:

- *Access control* – does the site have properly located entrances, exits, fencing, landscaping and lighting which can direct pedestrian and vehicular traffic in a way that discourages crime?
- *Surveillance* – Are there opportunities for criminals to undertake their actions without being seen? To what extent is the area covered by natural (visible by neighbours/passers by), organized (patrols) or mechanical (camera) surveillance?
- *Territorial Reinforcement* – Land that seems to be uncared for is vulnerable to abuse, so is it clear who owns and has responsibility for the property or land? *Lighting* – What sort of lighting is in place? Does it provide a sense of security to the public, or allow criminals to conceal their activities?
- *Environmental/litter/graffiti* – The presence of poor environmental conditions, litter or graffiti indicates neglect and attracts negative behaviour. Does the location have problems of this type?

Once the findings of the audit have been examined, a course of action can be recommended that is specifically tailored to the situation. One of the most important factors in determining what should be done is the overall context of the location under review. If it is within a larger area in which there are significant problems, then the recommended action may be more ‘extreme’ than in a neighbourhood that is generally law-abiding. An example of an ‘extreme’ action would be removal of vegetation almost to the point of clearcutting, while a ‘moderate’ action might include improved signage.

Generally speaking, the staff of the Community Response Team have profound concerns about trails and paths. They get a very high level of complaints from neighbours and perceive that although 90% of usage is legitimate, they are used extensively for illegal activities including break and enter, vandalism, drug trafficking and underage drinking. They also provide secluded access or get-away routes after dark in residential neighbourhoods.

6.2.1 Recommendations

The Community Response Team should be consulted during the detailed design stage for new trails, particularly during route selection. They can advise on how to increase surveillance, the design of entrances and other access points, lighting etc. Their experience will provide valuable insight into potential problems and how they can be avoided.

6.3 Trails Planning in Other Cities/ Regions in Canada

Sources

Four information sources were used for this Best Practices research. They were selected to draw on advanced experience and expertise (Calgary), and also to examine the approaches used by cities with similar size and resources (Victoria, Fredericton). In addition, the Ontario Trails Strategy was reviewed. The documents consulted were:

- City of Victoria Greenway Plan (2003)
- Calgary Pathway and Bikeway Plan (2000)
- City of Fredericton – Trails Project Coordinator (Harold Boone 506-460-2440)
- Active 2010: Ontario Trails Strategy (2005)

Victoria and Calgary have prepared detailed greenway plans oriented to active transportation. Fredericton is in the early stages of the same activity. The Ontario study establishes strategic directions for planning, managing, promoting and using trails in Ontario. Other jurisdictions can be easily accessed on-line for comprehensive coverage of this topic (eg. Edmonton).

6.3.1 VICTORIA

This plan is the most relevant to the circumstances of HNWTa.

1. Vision and Goals

This is a 50-year plan with three broad goals

1. To establish a human-powered transportation network
2. To restore native, aquatic and cultural habitats
3. To provide opportunities for recreation

The vision of the plan is to provide a safe, enjoyable and engaging recreational experience, to allow users to experience different habitats within an urban setting, and to link destinations.

There are three categories of greenways*:

- People-only (pedestrians, bikes, other non-motorized rolling traffic, emergency and maintenance vehicles)
- People priority (includes those above plus motorized vehicles on secondary collectors and local streets)
- Shared greenways (all traffic non secondary arterials and primary collectors)

2. Greenway Planning

The network is designed to link with the regional trail network, serve all neighbourhoods and connect to the transit system. It incorporates the following planning principles:

- Promote connectivity
- Distribute trails equitably among neighbourhoods

* Greenway Corridors are elongated and usually continuous strips of land and/or water under public control through ownership, easement or other arrangement which serve recreation and/or conservation needs. (Halifax Regional Municipality Real Property Planning. "Park Planning and Development Guidelines". April 2005)

- Provide for multi-modality (different users)
- Establish greenways infrastructure and funding as a lasting legacy for future generations
- Prioritize allocation of resources based on:
 - Protecting existing greenways
 - Taking advantage of unique acquisition opportunities
 - Filling gaps in existing network
 - Enhancing existing greenways
- Routes are designed to:
 - Promote personal and public safety
 - Provide emergency access
 - Be interesting, engaging and enticing
 - Minimize conflict
 - Limit amount and speed of vehicular traffic (where permitted)
 - Maximize opportunities for education and participation, encourage stewardship.

The plan strives to incorporate visual variety, amenities, and connectivity. It identifies short and long term opportunities, and establishes priority projects that are implemented as resources become available. Routes for new trails or connections across private land are identified and negotiated as opportunity and budgets allow.

The trails plan is accepted by council and is a legal document. It is automatically integrated into local community plans as they are updated– unless a more detailed version has already been completed. It provides the framework for discussions with landowners, including developers, and for strategic purchases of land.

Design

The design criteria incorporate the following elements:

- CPTED principles – balancing safety with visual interest
- Accessibility standards
- Standards for width, surfaces and markings
- Signage

3. Funding and Resources

Funding for trails development comes from internal (annual municipal budgets), external (partnerships with other levels of government, non-governmental organizations, developers) and community sources.

Funding and resource acquisition strategies include:

- Full time trails coordinator position
- Annual budget allocations (capital and operating)
- Development cost charges (paid by developer)
- Local improvement project matching grants
- Supporting local improvement projects through a tax levy (limited time local area rate)

- Establishing and supporting stewardship groups
- Establishing endowment funds
- Corporate sponsorship of a portion of trail or entire trail

4. Public Education

An important role for the coordinator is to undertake public education about the trails system. This includes increasing awareness of the network, increasing usage, encouraging responsible behaviour (anti-litter, codes of conduct for users), and encouraging community involvement in projects.

5. Related Projects

These include preparation of maps, installation of signage and interpretative boards, rehabilitation of habitat and restoration of damage. The projects can also be oriented to increasing amenity – such as improving access to washrooms, providing bike racks, improving bus shelters, and creating street and trail gardens.

6. Implementation Strategy

Victoria has a detailed implementation plan identifying specific projects, resource allocation, timing and barriers. It includes a list of broad priorities – such as working with neighbouring municipalities, amending by-laws, establishing signage and maintenance standards – and also geographically specific projects. The 50-year time frame allows for a measured approach within a well-defined long term strategy that provides clear guidance.

6.3.2 CALGARY

The Calgary Pathways and Lifecycle Plan has recommendation in six sections;

1. System Planning

The plan is strongly oriented to bikeways and multiple usage of pathways. The following planning principles are most relevant to pathways.

Planning Principles

- Pathways should be designed, maintained and retrofitted where necessary to accommodate multi-use, users of all ages, and be accessible
- Clarification is required concerning use of pathways by cyclists and in-line skaters and to minimize conflict
- The network should be continuous, as far as possible, and pathways should avoid on-street linkages
- Priority of cycle/pedestrian facilities should be based on user information and needs assessments
- Pathways through parks and open space are given priority, and routes selected to take advantage of natural features
- Pathways should be integrated with transit facilities
- Pathways should intersect with streets at regular intervals

Design Criteria

- Pathway routes are selected to integrate into the open space system
- Opportunities to use existing rail, utility Rights Of Way (ROW) and other corridors should be considered
- Routes are designed to provide visual amenity, variety and connectivity
- Routes selected to enhance recreational potential; and connect destinations, residential areas, parks and natural areas.
- Preferred location: public land, good surveillance and safety, aesthetics and views, vegetation, topography, adequate space, linkages with streets
- Avoidance of sensitive areas, steep slopes, alleys, major roads, underpasses, mid-block crossings.
- Design guidelines should consider surface material, markings, intersections, and accessibility.

2. Education, Encouragement and Enforcement

The purpose of education programs is to:

- Raise awareness
- Promote safe, responsible, and accountable behaviour
- Reduce user conflicts
- Promote active living
- Generate respect for non-motorized forms of transport

Encouragement is presented as the partner of education by promoting usage and participation. It includes installation of bike parking and other amenities. The purpose of enforcement is to ensure that pathways and bikeways are used responsibly. Plans include enforcement by police bike patrols to enhance safety and security.

3. Signage

The plan recommends that signage incorporate:

- Barrier-free design
- Warning signs – including inaccessible areas
- Destinations
- Facilities
- Distance
- Crossings
- Location
- Names of trails
- User groups
- Rules of operation

4. Lifecycle Management

In order to be sustainable, the system needs to be regularly inspected and maintained. The plan calls for an inspection schedule, a repair schedule and a tracking system.

5. Route Analysis and Missing Links

Ongoing route analysis is conducted to determine priorities for construction, upgrading, maintenance; and to identify missing links that can be filled over time through purchase or agreements with developers.

6. Funding

Funding is obtained through internal sources, agreements for new developments, provincial programs, federal funding, outside agencies and non-governmental organizations, community partnerships.

7. Implementation Strategy

The implementation strategy requires designated staff and a committed municipal coordination team, an active citizen's advisory committee, and supportive civic officials.

6.3.3 FREDERICTON

Background

The City operates over 70km of trails, about 60% of which are in municipal ownership with the rest under agreements with crown land agencies and corporations (e.g. CN).

Initially, the Fredericton Trails coalition promoted trails development and took on some projects, however, they did not undertake planning. Now the municipal administration has taken over trails development and management and is involved in Active Transportation and the development of greenways. It has set up a committee and is about to initiate a master planning process.

Standards

Current standards for Fredericton's trails are drawn from a number of sources. Generally they aim for 3.0 to 3.5m corridors with shoulders. There are no hard surface trails at present but these will be added in the next stage of trail development. CPTED principles will be applied mainly through the addition of lighting.

The City has completed the network of trails through parks, along the waterfront and along the rail bed. The next challenge will be to expand the trail system into new development and improve the construction standards – particularly increasing the amount of hard surfaces, and adding amenities such as bathrooms and bike racks.

6.3.4 ONTARIO

There are 600 local and regional trail clubs in Ontario. These include hiking groups, snowmobile clubs and trail management associations. Many of the 447 municipalities and 36 conservation authorities also build and maintain trails. Businesses sponsor trails and contribute money and resources. There are also provincial umbrella organizations that provide a voice for trail interests, trail user organizations, and provincial agencies such as the Trillium Foundation and the Ontario Heritage Trust that secures land and supports conservation/trail easements.

Active 2010 was prepared by the Ministry of Health Promotion in Ontario as a coordination document. It gives a general description of what needs to be done to increase the development and use of trails in Ontario. Information in the report is provided under the following sections:

- General background on trails in Ontario and why they are important
- Challenges
 - Recent trends affecting trails
 - Challenges facing the trails community
- Vision, Goals and Values
- Framework for Action
 - Strategic directions
 - Core values
 - Improving collaboration among stakeholders
 - Enhancing the sustainability of trails
 - Enhancing the trail experience
 - Educating Ontarians about trails
 - Fostering better health and a stronger economy through trails
 - Shared responsibility

The strategy provides a high level analysis of issues, challenges and needs in the planning, construction, management and promotion of trails in Ontario. It sets out action themes, but stops short of presenting an action plan with specific actions, timelines and resources. It provides a useful analysis and general guidance, but no detail. Basically, the provincial government in Ontario has limited responsibility for trails. It can influence outcomes by providing leadership, coordination and facilitation; funding research; assisting with promotion; helping to develop standards, and providing crown land for trails. However, the work of creating plans, identifying projects, negotiating with landowners, undertaking constructing, and providing maintenance rests largely with municipalities, volunteer-based associations, and a few government agencies.

6.4 Recommendations for HRM based on ‘Best Practices’ Research

1. HRM should adopt a long term time frame in trails master planning

Victoria’s 50-year plan allows for a complete vision to be developed and implemented in manageable stages. It ensures that the planning process is not undercut by assumptions that all significant work must be completed in a much shorter time frame, and supports strategic actions such as the introduction of by-laws and new funding initiatives that may take time to put in place but which facilitate the implementation of the plan.

2. There should be a common set of broad objectives for trails planning

Trails can be used for a wide array of purposes such as active transportation, enhanced connectivity between parts of the city, to support the use of transit, to increase low cost opportunities for relaxation and recreation, and for environmental and cultural education. The more the objectives are integrated into trail routing and design, the more they become attractive, interesting and consequently the trails will be better used.

3. Trails should be planned and designed for a wide array of users

Trails that serve a wide cross-section of citizens will be better used than those intended for a narrow range of users. They also generate a broader sense of ownership and stewardship. Establish categories for trail usage and adopt clear design standards for each one.

4. A financial and human resource plan is essential

In addition to the trails master plan, a long-term funding and human resource plan should be prepared to cover implementation, operation and maintenance. If the resource plan cannot cover the trails infrastructure adequately, the municipality should develop supplementary sources or limit the scope of the plan. The worst-case scenario is a network of poorly built and maintained trails that are unpleasant or even dangerous to use and risk being abandoned in the long term.

5. Develop alternative funding mechanisms

Since the financial resources of municipalities are limited, trails are almost always under funded. In order to get around this situation, new funding mechanisms should be developed. This may permit such options as private funding through endowments or donations, community fund-raising, temporary local area rates, corporate sponsorship, or sponsorship by non-governmental organizations such as Service Clubs. Supportive measures such as tax benefits to corporations should be considered as part of this package.

6. Plan for monitoring and repair

A lifecycle manage plan should be prepared for all trails as part of the development process. This sets out the monitoring, repair and maintenance schedule that keeps the system in good repair.

7. Actively build community awareness, education and stewardship

The sustainability of the trails network requires ‘ownership’ by a broad sector of the community. It takes time, effort and resources to build awareness, responsibility and stewardship and the resources need to be allocated as part of the implementation plan. The starting point is information, and the community needs several types:

- Where the trails start, where they go and how they interconnect
- Who they are for
- What activities are permitted and prohibited
- The responsibilities of users
- How individuals can become involved in the stewardship

There should also be awareness-building promotion using ads, posters, maps and brochures. Also promotional events can be organized such as fun days for the family or local school students. It may be possible to work with the provincial office of Health Promotion to deliver this kind of program. At all events, responsible usage should be highlighted.

7.0 Recommendations

The following recommendations are provided to assist the HNWTa and HRM with the implementation of the Integrated Master Plan.

7.1 General Recommendations

This trail plan addresses a number of longer term planning issues as well as short term priorities. Implementation of the plan will be determined by available resources and evolving community interests and priorities. Some of the longer term recommendations which will require ongoing support by HRM planning and development staff as well as residents of the community include:

- a continuous trail corridor from Sackville to Long Lake Provincial Park
- a response to development pressures
- conversion of future abandoned rail line to trail
- planning for the Blue Mountain-Birch Cove Lakes Regional Park
- HRM planners to work with Trail Groups and developers to incorporate trails into new Development Agreements
- update master plan for Mainland Common

A number of short term projects are discussed in Section 8.0. Other more immediate priorities include the following.

Policy and Administration

- entrench trail networks as permanent assets to the municipality
- hire a trail expert to work long term on regional trails implementation, integration and community education
- more training, guidance and resources for volunteer trails groups to increase community involvement in trail development and stewardship
- HRM visitors map should include bikeways and walking/ hiking trails

Promotion

- identify HNWTa area trails on HRM trail maps and websites
- HRM to promote walking/ hiking as part of a healthy lifestyle, as well as an AT tool

On the ground

- implement and upgrade way-finding signage to promote and facilitate trail use
- maintain and upgrade trail surfaces and access points at key problem areas

7.2 Trail Standards

Existing and Proposed Trail Uses and Types

trail uses

- recreation/fitness/sport
- dog walking
- outdoor/environmental education
- natural heritage interpretation
- access to wilderness recreation
- Active Transportation (commuting)

trail types

- wilderness
- suburban walkways
- multi-use recreational
- interpretive, outdoor education
- parterre, exercise trail
- sensory (for visually impaired)



In order to create an effective trails plan for a large and diverse area it is important to recognize the variety of current and potential trail users and trail types. The above lists of trail uses and types were compiled from field observations and working sessions with the HNWTa and the public.

Dog walking is a popular trail use in the HNWT area. Several residents inquired about off-leash dog recreation opportunities. This is part of a broader HRM by-law issue and beyond the scope of this study. An off-leash dog area should be planned for the HNW area as there currently is none. This would not only meet a popular demand but also improve the trail experience for on-leash and non-dog-walkers. An off-leash area should not occur in sensitive environments.

The HNWTa study area combines a mix of urban, suburban and wilderness areas, each requiring different treatment for trail construction, development and nature conservation. It is important to envision and design trails appropriate to the surroundings and expected degree of use. The natural earth surface of a woodland trail is appropriate for trails in the Blue Mountain-Birch Cove Lakes wilderness area while crusher dust surfaces are appropriate for most high use walkways such as Moir's Run near Paper Mill Lake.



Table 2 shows recommended standards for various types of trails.

Trail type/ use	Surface types	Width	Examples
high use walkways	crusher dust	2.0 m	Linear Trail Moir's Run
parkland	crusher dust, wood chip	1.0-2.0 m	Hemlock Ravine Mainland Common
wilderness areas	woodland	0.5-1.0	Blue Mountain/ Birch Cove Lakes
sensitive areas	bridges, board walks	2.0- 2.5 m	Belchers Marsh Mainland Common
priority winter maintenance	paved*	2.1-3 m	school routes Linear Trail

Table 2: Trail Standards

A suggested check list of standards for trail construction is provided in Section 9.0 at the end of the report.

* Use of pavement should be kept to a minimum, for priority walkways and school routes that need plowing.
Integrated Master Plan for Trails on the Western Side of the Bedford Basin, 2006

7.3 Detailed Recommendations

The following recommendations highlight the characteristics, challenges and opportunities related to each of the major existing trails within the study area. They are listed in order of priority according to the HNMTA.

1. Mainland Common - District 10 (150 acres)

The Mainland Common is planned to serve the recreational needs of a large residential area and Halifax West High School but its potential has not yet been developed. This park area should be a blend of active and passive uses and natural areas with multiple benefits to the diverse and growing population. Further study and trail planning in the passive recreation area is strongly recommended before Regency Drive is completed.

Trail priorities include:

- Halifax West school routes
- school phys. ed. facilities, 5km loop trail
- Accessible trail loop in south east corner
- protection and interpretation of sensitive areas



2. Belcher's Marsh - District 10

Belcher's Marsh is a natural wetland surrounded by high density suburban development. It provides safe, accessible, convenient contact with nature and is heavily used by the surrounding communities and schools for walking, nature observation and outdoor education. Trail priorities include:

- repair and maintain trails around marsh
- remediate storm water collectors
- better signage/ way-finding within the neighbourhood
- interpretive signs (in progress)



3. Blue Mountain-Birch Cove Lakes - District 16 (4,000 acres)

The Blue Mountain-Birch Cove Lakes Area is an outstanding wilderness resource close to the urban centre of HRM. As a Regional Park, it will provide unprecedented recreational and natural conservation opportunities. Due to the longer time line required for the regional park planning process, improved trails and access points to the Birch Cove Lakes area are not yet detailed in this plan. Trail priorities include:

- determine appropriate trail routes that provide access with limited disturbance to this environmentally sensitive area
- designate low impact, wilderness trails to preserve existing natural environment
- interpretive materials and way-finding signage
- create connection from residential neighbourhoods across Hwy 102



4. Linear Trail - Districts 10, 15 and 16

The existing Linear Trail along a power line provides a convenient link between neighbourhoods and other trails. It is a major route in the Integrated Master Plan.

Improvement priorities include:

- many sections need remediation along trail edges
- engage residents in stewardship
- lighting
- appropriate signage (distance markers/ natural features)



5. Mill Cove - District 21

Although public access to the waterfront is in conflict with current industrial and military uses, the combined visions of the Land Use Plan and the Active Transportation Plan, support the need for a pedestrian and multi-use trail system along the waterfront.

Trail priorities include:

- connection from Mill Cove Shopping Centre to Old Coach Road
- connections to the peninsula
- connections to abandoned rail line



6. Bayer's Lake Business Park - District 10

There is a critical need for safe and effective routes and signage for non-motorized transportation at the Bayer's Lake Business Park. A study and recommendations for improvements was completed by HRM planners in 2003. The HNWTa study reinforces the pressing need for these changes. Improvement priorities include:

- sidewalks
- cross walks
- signage
- trees
- human scale landscaping
- bus shelters
- bicycle racks



7.4 Areas Requiring Detailed Analysis and Trail Planning

The Integrated Master Plan was intended as a broad brush analysis and trail mapping exercise. During the consultation process, the following areas were identified where detailed study and trail planning and design and management is required:

- Mainland Common
- Blue Mountain-Birch Cove Lakes
- Paper Mill Lake
- Mount St. Vincent University/ Motherhouse Lands
- Hemlock Ravine
- Old Coach Road
- Golf Course and Maritime Broadcasting Lands
- Mount Royale
- Bedford South/Bedford West
- Upper Sherwood Park

7.5 Trails and the Planning Process

One of the main concerns about trails planning is how the plan can be implemented. In HRM, as in most municipalities, this is a multi-stage process.

Regional Plan and Secondary Plans

In undeveloped areas, several steps are required as part of a formal planning process. First of all, the draft Regional Plan⁷ (once adopted) will set out the broad framework for the future of development in each plan area. The plan for each area (Secondary Planning Strategy) will then be revised to reflect the current and future needs of its residents. This revision process will probably take several years. In the urban area, the draft Regional Plan makes few changes to the way development proceeds, and development applications will continue to be processed much as they are at present.

As-of-Right Development

Development is undertaken in two main ways. If the developer wants to create his/her plan strictly in accordance with the requirements of the land use zone and the landuse by-law, then it can proceed As-of-Right. There is no public input into this process and it proceeds as a dialogue between the developer and the municipal Development Officer.

Development Agreements

Alternatively, if the developer wants to create a project that is different from the narrow constraints of the zone and by-law, or if he/she is proposing to develop a substantial block of land, then a Development Agreement is negotiated. This allows both sides to bring to the table new elements that each wants incorporated. Public input is sought in this process through a public information meeting early in the process when the project is ‘unveiled’, and through a

⁷ April 2006

public hearing just before Council makes its decision. In all parts of HRM other than the downtown, the local Community Council makes all planning decisions.

In the past, a Planning Advisory Committee gave concrete ideas and input on such plans, assisting community council. Reinstatement of this committee would allow input on the many remaining development opportunities.

When staff start working with the developer to negotiate the development agreement, they draw together relevant plans and reports that can help clarify the public concern and interest regarding land use. In Halifax Northwest, these plans will include the Active Transportation Plan, the Mainland Common plan, trails plans and others – all of which show the importance to the community of creating human-powered transportation routes and passive recreational opportunities in this area. The developer is then asked to take these plans into consideration when designing the new development. Increasingly, trails are being incorporated because they increase the attraction of the development to purchasers. The exact location, width and construction standards are negotiated.

Recreation Land Contribution by Developers

Under the draft Regional Plan, 10% of the property (or cash in lieu) must be signed over to HRM as recreational land. This land must be useable, and may be in a variety of configurations. Trails are a valid form of contribution. The dilemma for staff is that there are other recreational demands that must also be met – tot lots, basketball courts etc. - and their responsibility is to establish a balance between these competing recreational needs. This is where the community can be consulted.

Funding of Trails

Allocation of trail funding in an equitable basis with clearly verifiable criteria upon which each application is evaluated in an open and transparent process is what the community demands. A review of this HRM procedure will allow for consistent funding so that HNWTA and other trails groups can act effectively towards planning and building more trails.

Role of the Trails Plan in Future Development

This Plan can be used in two ways. It can be kept as an internal document by the HNWTA to guide future trail development, or Community Council may adopt it as a planning document. For this to occur, it must be reviewed and recommended by staff. Once adopted, it can then be used as formal background document during the process to revise the Mainland Secondary Planning Strategy.

8.0 Recommended Top Priority Projects

Figure 4 shows proposed top priority projects identified in consultation with the HNWTA and HRM staff. Generally these projects meet the following criteria.

- current demand
- low to medium capital cost
- opportunities for access to natural areas
- opportunities to integrate trails with new developments
- land available now or in near future

The following table lists proposed Phase 1 projects. The estimated costs provided are based on recent trail construction experience.

HNWTA Priorities

Project	Description	Estimated Cost
Mainland Commons Loop Trail	850 m, crusher dust	\$ 50,000
Revision of Mainland Common master plan	Establish trail priorities	to be determined
Repair trails at Belchers Marsh	erosion control, new surfacing	\$ 50,000
Improve Linear Trail	improve surface, lighting, landscaping	\$100,000
Trails planning on crown land in BMBCL area		to be determined

HRM Priorities

Repair trails at Belchers Marsh	Improve storm water control	To be determined
Trail to Park West Elem. School	500 m, crusher dust	\$ 30,000
Trail to Halifax West High School	1,200 m, asphalt	\$150,000
Sidewalks in Bayers Lake Bus. Pk.	3,000 m, conc. sidewalk	\$450,000
Trail through Armdale Rotary	integrate with road design	to be determined

Table 3: Proposed Phase 1 Projects

In addition to capital projects, other priority projects include continued advocacy for the integration of trails and sidewalks with transportation and development planning. This includes other proposed road and highway project such as the redesign of the Fairview Overpass and a number of possible future opportunities for the crossing of Highway 102. The areas identified for detailed study and trail planning are also shown on Figure 4 because this process should begin as soon as possible.

9.0 Trail Planning and Construction Check List

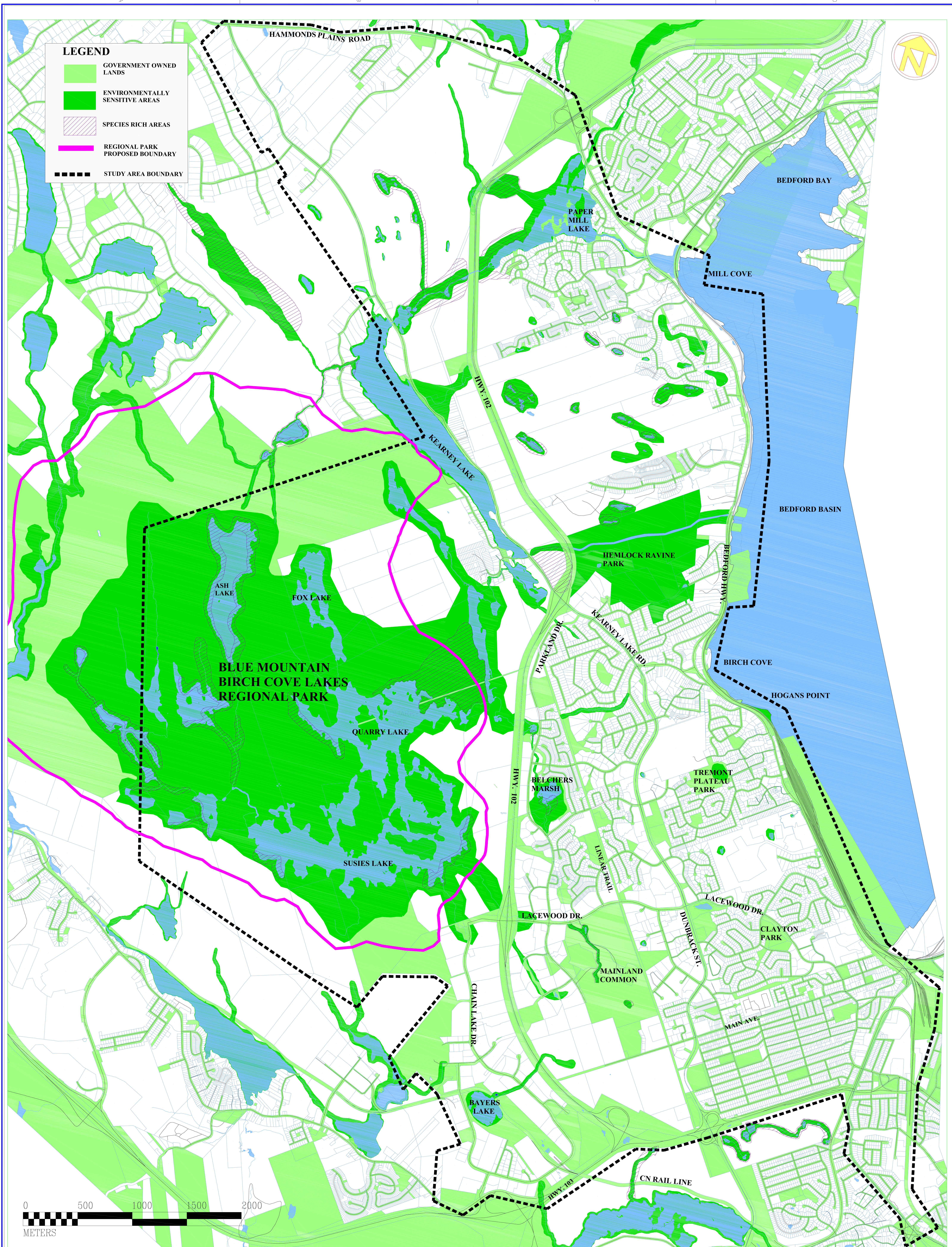
During the consultation for this plan, the poor condition of some of the existing trails in the Halifax North West area was raised as an issue. In some cases, the quality of construction was identified as the cause of poor trail conditions. In some cases, it was suspected that substandard trail construction completed by private developers had been accepted and taken over by HRM. Trails should be considered as all other municipal infrastructure with rigorous construction standards which must be met before infrastructure is accepted by HRM.

The following check list is provided to assist with the evaluation and acceptance of future trails projects.

1. Is there a community trails group in this area? If yes, are they involved in the various stages?
2. Have natural contours, features and assets been utilized to the best advantage without compromise?
3. Does the trail width meet standards for trail type and use?
4. Is the trail gradient less than 8%?
5. Is the trail constructed to barrier free standards if so required (CAN/CSA-B651)?
6. For crushed stone trails, has a proper stone product been used (NSDTPW Type 1 Gravel, crusher dust or other approved material)?
7. Has a sufficient depth of gravel been provided (min. 150 mm after compaction)?
8. Is the surface smooth, even and well compacted and free of erosion?
9. Is the surface graded for proper drainage (min 2% slope), free of low spots and depressions?
10. Is the surface free of stones and other tripping hazards?
11. Have adequate culverts or other structures been provided where required to accommodate water courses and surface drainage?
12. Are side slopes stable (i.e. free of erosion) and not greater than 1:3 (v:h)?
13. For side slope gradients steeper than 1:3, have stable retaining walls, rock rip rap or other suitable structure been provided?
14. If rock rip rap has been used, has it been carefully placed and blended with the natural environment?
15. Have suitable guard rails (as defined in the National Building Code) been provided at all vertical drops greater than 600 mm or any other hazardous conditions?
16. Have all disturbed areas been revegetated?
17. Have suitable barriers been provided where ever required to prevent vehicle access?
18. Has a gate been provided at a suitable location to accommodate maintenance and emergency access?
19. Where required, has vegetation been cleared to provide clearance, sight lines and visibility?
20. Has signage been provided to identify trail entrance? Is there a map of the trail route and interpretive information?

continued on next page...

21. Does signage include emergency?
22. Have boardwalks or other measures been taken to protect sensitive areas?
23. Has all construction debris been removed from the trail site and adjacent/abutting land?
24. Has a one year warranty been included in the agreement with HRM?
25. Has an end of warranty inspection been completed?



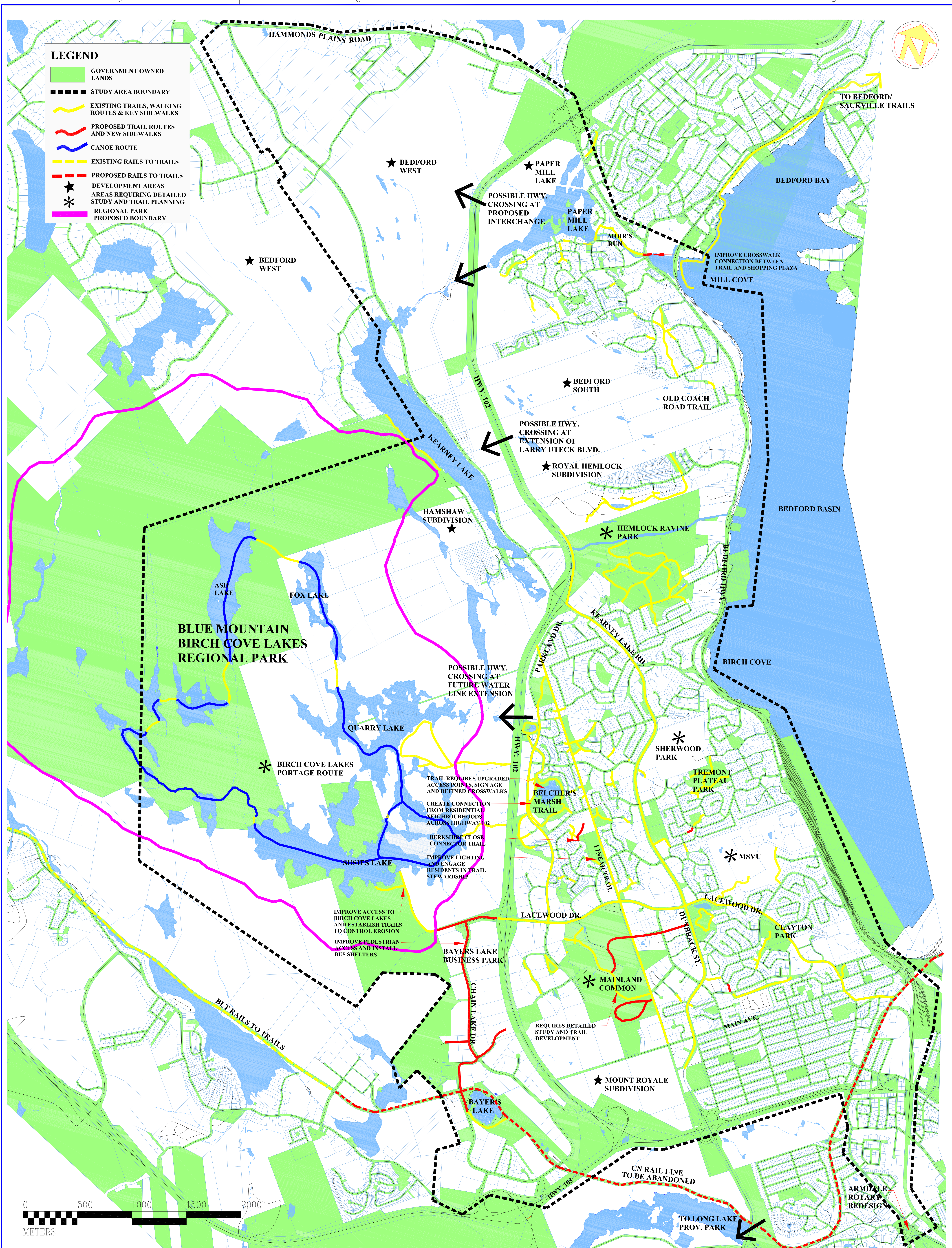
Halifax North West Trails Association Integrated Master Plan

drawing title:
Land Ownership
and Environmentally
Sensitive Areas

date:
June 15, 2006

Figure 1

Gordon Ratcliffe
Landscape Architects
in association with
Griffiths Muecke
Associates



Halifax North West Trails Association Integrated Master Plan

drawing title:
Proposed Phase 1 Projects

date:
June 15, 2006

Figure 4

Gordon Ratcliffe
Landscape Architects
in association with
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Associates

10.0 References

Calgary Trails

www.designcentreforcpted.org

EDM Environmental Design and Management Ltd. "Blue Mountain/ Birch Cove Lakes Assessment Study". March 2006

Halifax Regional Municipality. On-line "Regional Plan". April 25, 2006

<http://www.halifax.ca/regionalplanning/FinalRegPlan.html>

Halifax Regional Municipality. Active Transportation Plan. Newsletter No. 1. August 2005

Halifax Regional Municipality (Real Property Planning). "Park Planning and Development Guidelines". April 2005

Ontario Ministry of Health Promotion. "Active 2010: Ontario Trails Strategy". 2005

Design Centre for CPTED - Vancouver (www.designcentreforcpted.org)

Personal communication (CPTED): Gary Martin and Jane Nauss, HRM Community Response Team

Active 2010 - Ontario Trails Strategy 2005

City of Victoria Greenways Plan, Victoria BC, 2003

Calgary Path and Bikeway Plan, City of Calgary, 2000

Personal Communication: Harold Boone, Trails Coordinator, City of Fredericton

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Jillian Ratcliffe: field study, map production

Gordon Ratcliffe: project management, trail planning

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