Town of Rothesay

Rothesay Active Transportation Plan

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1 Introduction

1.1 Town Overview

The Town of Rothesay is a suburban community of approximately 12,000 people and located ten minutes east of the City of Saint John in the majestic Kennebecasis Valley alongside the Kennebecasis River. The Town is home to active, engaged, and family-focused citizens, who are proud of their community and who work hard to preserve its culture and character.

Although traditionally a residential community, the Town has a growing shopping district that is home to private ventures and nationally recognized franchise type businesses, as well as an expanding level of professional services readily available to serve its citizens and entrepreneurs. Regionally, the Kennebecasis Valley area has five elementary schools, three middle schools and two high schools. The Valley area also has many churches, of all denominations, and offers the services of a regional library and three arenas.

The Kennebecasis River is a major attraction that enhances the quality of life in Rothesay. The stunning, panoramic views of the Kennebecasis River and the Town's historic character make Rothesay one of the most beautiful places in Canada.

1.2 Motivation for the Plan

The Town's landscape, topography, density and access to the river offer an immense opportunity for strengthening recreation and active transportation. The beaches, parks, sports fields, schools, places of worship, and shopping, are just some of the Town's assets and destinations.

There is no question that Rothesay residents want to be out enjoying their community, but there has been a need for a more established network of active transportation corridors, with enhanced physical assets and a campaign of education and promotion. There are also challenges along key corridors and connections between various areas of the Town that need to be addressed to facilitate non-motorized transportation movements.

The Town is committed to two important goals of sustainable development and physical activity for its residents. The Town has identified Active Transportation (AT) as an important component of its on-going commitment towards more sustainable development and physical activity.

This Active Transportation Plan was advanced to provide an integrated approach at both the community and local governance level to develop a multi-use system of movement that is inclusive of all transportation methods available throughout the Town. The Plan also fulfills a recommendation in the 2009 *Rothesay Recreation Master Plan.*

1.3 Rothesay AT Challenges and Opportunities

Providing AT Facilities along Key Corridors

Very few of the roadway corridors in Rothesay provide any type of special facility for cyclists. It would be desirable to develop a connected network of cycling facilities along the existing key roadway corridors that would include a mix of bike lanes, shared lanes, and paved shoulders.

Although road widening will be necessary on some corridors, widening all of the key roadways for bike facilities is neither feasible nor practical based on property and utility constraints and high construction costs. Therefore, retro-fit solutions are required that provide for appropriate cycling infrastructure while not compromising the safety and mobility of the corridor.

Making roadway corridors more inviting and functional for active transportation is a complex challenge that involves many inputs and interests, including not only AT considerations, but also traffic mobility, safety, streetscaping, transit access, and property impacts.

Lack of Formalized Trail Systems

The Town has limited options for a formalized network of multi-use and natural trails. There are a few short trails, including those at

Steele Kennedy Nature Park, East Riverside Kingshurst Park, and Bicentennial Park, but these are localized footpaths that do not link into a wider system or provide a true multi-use function.

The Town needs to explore options for a permanent and formalized system of trails, both as strategic active transportation links and for recreation. This will require a review of existing and future connections, with consideration for public land opportunities, private land constraints, and opportunities for land acquisition or easements.

As a starting point, the new pipeline corridor adjacent to Route 1 may be formalized as a walking trail, with a possible future connection to Fox Farm Road. Opportunities may also exist through existing power line corridors, alongside the CN rail corridor, or along the riverfront. Short, strategic trail connections between and within neighbourhoods will also be important to maximize accessibility for non-motorized travel.

Connections to French Village

The French Village area is segregated from the main areas of the Town and Route 1 and Route 111 are major barriers for active transportation links. Route 111 is not a desirable setting for walking or cycling due to the high vehicle speeds and narrow paved shoulder and the Route 1/Route 111 interchange is very congested and has not been well equipped for pedestrians or cyclists; however, the reconstructed interchange being completed this year features a separated walkway. This new piece of infrastructure presents an opportunity to explore the development of a complete AT link from French Village to Campbell Drive with continued connections to the AT network in the heart of Rothesay.

Place-Making

Part of active transportation is creating spaces where people want to be, or “place-making”. Rothesay has an abundance of attractive spaces and destinations, but there is an opportunity to improve upon the character of some corridors, particularly Hampton Road. Hampton Road features a number of transitions, from park land, to residential, to institutional/recreational, to commercial. There is a desire to improve the character of Hampton Road through the commercial area, to make it more of a “downtown” street versus a suburban arterial thoroughfare. Strategies could include provision of grassed boulevards and medians, better pedestrian crossing access, and other streetscaping fixtures.

Establishing key destinations is also an important part of an active transportation network. These may include hubs of the transportation network or important civic areas such as Rothesay Common, Rothesay Arena, Renforth Park, or the Town Centre commercial district. Destinations should be equipped with amenities such as bike racks, fountains, benches, wash facilities, public art, etc.

1.4 AT Plan Objectives

The following key objectives were established for developing this AT Plan:

1. Engage stakeholders, the public, Town staff, and Council frequently throughout the project to create a "Built in Rothesay" solution, reflecting the community vision and character;
2. Improve and promote active transportation options through and within the Town for better access between residential nodes and destinations, including recreational developments, schools, employment centres, waterfront, transit nodes, and other amenities;
3. Identify barriers and impediments to active transportation movements and identify practical solutions to address these;
4. Optimize the use of existing infrastructure and identify physical improvements and standards required to accommodate a sustainable AT network;
5. Develop a more formalized off-street trail system;
6. Coordinate with AT plans and initiatives of the neighbouring communities;
7. Coordinate the active transportation recommendations with those in the Rothesay Traffic Study; and
8. Develop a 5-year implementation plan that is technically feasible and financially achievable.

2 What is Active Transportation?

2.1 Overview

Active Transportation (AT) means using human powered transportation (rather than cars or other motorized vehicles) to get to and from local destinations, such as work, school, businesses, facilities, events and much more. AT can be defined by four categories:

1. **Active Commuting** which involves journeys to and from work;
2. **Active Workplace Travel** which involves travel during day time work hours which includes work related trips for the delivery of materials or travel within the Town to attending meetings or work related appointments;
3. **Active Destination Oriented Trips** includes trips to and from schools, shops, visiting friends and running personal errands; and
4. **Active Recreation** which involves AT modes for fitness or recreational pursuits, such as walking, running, hiking and cycling.

At its core, AT involves having a purpose or destination, rather than just going out for a walk or run for fitness and leisure. Whether stepping out to pick up a few groceries, cycling with your children to their school, or walking or biking to work, AT is a healthy and practical option.

Why active transportation matters

Active Transportation:

- improves **public health** and reduces healthcare costs by fighting obesity and chronic illnesses like heart disease and Type 2 diabetes.
- is **emissions-free**, making it a powerful tool in the fight against climate change and air pollution.
- is **accessible** to children, youth, seniors, low income families and persons with disabilities who can be left out when transportation systems depend on cars.
- is integral to almost all trips made using **public transit**, and supports ridership goals.
- **improves safety** for all road users (by reducing automobile use) and all citizens (by adding "eyes on the street").
- brings real **economic benefits** by reducing the social costs of transportation, revitalizing commercial areas and boosting tourism.

The Public Health Agency of Canada is one of many organizations committed to promoting active transportation across the country. The Agency conducts research on active transportation and has

found many common elements among communities that endorse active transportation. Those common elements are as follows:

Common Elements to Endorse Active Transportation

- dedicated bicycle lanes and routes;
- specific measures to ensure the safe integration of pedestrians, cyclists and other active users among motorized vehicle traffic;
- regular maintenance and upgrades to pedestrian and cycling facilities;
- provision of bicycle storage throughout the community;
- an integrated network of pedestrian and cycling paths that are designed for efficient transportation as well as recreation;
- access to public transit easily integrated with pedestrian and cycling facilities;
- welcoming feedback from citizens, pedestrian and cycling advocacy groups;
- advocacy for sharing the road with cyclists;
- urban design that reduces the distances that people have to travel to get to work, retail areas, schools and recreational/leisure pursuits;
- streetscapes that are visually-pleasing and inviting to pedestrians;
- a network of green spaces throughout the urban and suburban areas;
- policies that encourage the retail and service sectors to support customers who use active modes of transportation; and
- driver education about sharing the road with others.

2.2 Active Transportation Concepts

Active Transportation is a broad movement that covers many concepts, encompassing physical infrastructure, social and economic issues, environmental awareness and protection, and changing societal attitudes. Several of these concepts are described below.

2.2.1 Removing Barriers

In planning for AT within a community it is important to recognize that there are a number of formidable barriers that reduce and undermine choices for non-motorized travel. These barriers should be considered when developing AT infrastructure and promotional campaigns.

AT Barriers

- Lack of knowledge about safe and convenient routes such as trails, bicycle paths, transit routes, etc.
- Neighbourhood design that favours cars over other modes of transportation
- Inadequate skills or a lack of self-confidence to use active transportation such as cycling
- Poorly designed or maintained transportation infrastructure
- Inadequate maintenance of sidewalks, bicycle lanes and trails
- A lack of amenities such as showers, change rooms, secure bicycle storage areas or bicycle racks, or a lack of knowledge that these facilities exist
- Inadequate or non-existent inter-modal connections, e.g., bicycle racks on buses
- Seasonal and/or weather-related barriers
- Fear of injury in winter or in other inclement weather conditions

2.2.2 Accessibility

In Rothesay the vast majority (89%) of the workforce commutes to their jobs in Saint John.

Vehicle ownership has brought many benefits, such as increased mobility, independence and improved access to markets, which are essential in a large, sparsely populated country like Canada. However, the resulting urban expansion has proved to be unsustainable in a number of ways. Many suburbs are characterized by cul-de-sacs, low levels of public transport provision and are not conducive to walking, cycling, and disabled access.

Social impacts of car-centric communities include alienation, stress, community severance (caused by physical barriers such as roads and major intersections), exclusion of people who do not have a licence and the loss of public space from roads and car parking. Long commutes to and from work also have a time cost and place a financial burden on families due to fuel and car maintenance costs.

Active Transportation fosters greater interaction between citizens within the community and creates safer environments through increased community surveillance. AT also reduces financial burden on families due to reduced automobile use and fuel consumption.

2.2.3 Sustainable Transportation

Sustainable transportation systems are those which, for example, aim to reduce emissions, fossil fuel consumption, and the consumption of agricultural land, park land and wildlife habitat. Most fundamentally, this means an emphasis on reducing the role

of the private automobile as the prime mode of transportation and shifting travel toward other sustainable modes of transportation and strategies, including:

- Active Transportation
- Public Transit
- Urban Planning & Smart Growth
- Carpooling, Vanpooling (Ridesharing and car sharing)
- Driving Practices, Fuels & Technology
- Employer Programs
- Awareness Campaign & Educational Tools

2.2.4 Walkable and Livable Communities

Municipalities that are committed to active transportation require new residential and commercial developments to reinforce that support through their physical design. Successful private sector developers also recognize that our aging, environmentally aware and health-conscious population favour more walkable and livable communities designed less for cars and more for people.

Rothesay residents for the most part enjoy many walkable aspects of their community. They also enjoy the comfort and convenience of a very green and walkable community where the quality is measured in the social interactions among residents. AT also makes Rothesay safer and more livable by reducing the risk of vehicle-pedestrian accidents. Some of the additional benefits of active transportation are:

- Increased social interaction within the community, resulting in much improved personal relationships and community health;
- Support to community-based businesses, such as local shops, restaurants, bakeries, newsstands, and cafes;
- Decreased traffic noise; and
- Reduced traffic jams and parking hassles.

Promoting AT is not just about building sidewalks and bike lanes. It is about building communities on a “human scale.” For example, traditional neighbourhoods built on a grid system with straight roads and avenues have short blocks with at least four travel options at each intersection. Generally, this type of traditional grid style neighbourhood is reasonably walkable and good for cycling.

In contrast many newer neighbourhoods are designed with curvy looping roads and many cul-de-sacs. Block lengths in these neighbourhoods can be very long with intersections providing fewer choices of travel directions. These newer types of

neighbourhoods are usually much less efficient for pedestrian travel as people have to go far out of their way to get to their destination.

Developers, planners and community designers can help by designing new developments that are suitable for walking, cycling and running. This includes not only the layout of the residential neighbourhoods, but also making land space available for a mix of uses (e.g., recreation, trails, sidewalks, roads, bike lanes) and buildings (e.g., shops, services, facilities).

2.2.5 Healthy and Active Living

Sedentary behavior such as sitting for long periods in a car during daily commutes is unhealthy. We also know that regular physical activity helps to improve health and may help to prevent chronic health conditions, such as cardiovascular disease, diabetes, lung disease and some cancers.

"To achieve health benefits, adults aged 18-64 years should accumulate at least 150 minutes of moderate- to vigorous-intensity aerobic physical activity per week, in bouts of 10 minutes or more."[1]

Accordingly every trip in a vehicle that can be replaced by active transportation is good for a person's health.

New Brunswick's Wellness Strategy describes "wellness pillars" related to healthy lifestyle choices: Healthy Eating, Physical Activity and Tobacco-free Living. Encouraging positive lifestyle choices may require behavioural changes that can only be achieved through an individual's mental fitness, resiliency and sense of "community" or belonging. The Strategy identifies homes, schools, communities and workplaces as key settings. There are five strategic directions that will result in action:

1. Form partnerships and collaborate with stakeholders.
2. Build capacity for community development.
3. Promote healthy lifestyles.
4. Develop and support healthy policies.
5. Conduct surveillance, evaluations and research."[2]

[1] Canadian Physical Activity Guidelines (18-64 years) - Canadian Physical Activity Guidelines and Canadian Sedentary Behaviour Guidelines, Canadian Society For Exercise Physiology, 2012

[2] Live well, Be well - New Brunswick's Wellness Strategy 2009-2013, published by: Province of New Brunswick. Wellness Culture and Sport, Fredericton, New Brunswick

Each of these directions above, provide guidance toward the implementation of an AT Plan for Rothesay that will create partnerships, and build capacity within the Town to promote active transportation.

2.2.6 Environment & Economy

There is a wide gap between the costs of road infrastructure versus those of AT. Economic impacts of a status quo approach to AT include increased cost of fuel and car maintenance, infrastructure costs, time lost to commuting, and the cost and injury associated with motor vehicle accidents.

On the environmental front, AT provides the following benefits:

- Reduces vehicle emissions and air pollution, and those pollutants from transportation sources that aggravate respiratory disease, and contribute to acid rain and property damage.

- Conserves natural habitat; fewer cars on the road decrease the demand for more roads and parking lots, allowing more land for green space.
- Reduces ozone layer destruction. Motor vehicle air conditioners are the world's single largest source of CFC leakage into the atmosphere.

2.2.7 Recreation and Tourism

Municipal investment in AT infrastructure, such as long-distance hiking and walking trails and bike lanes or paths can act as a tourism attraction and boost the local economy. Communities with good walkability and good bicycle and pedestrian amenities are places that attract and retain residents and visitors. Often such infrastructure is used for both recreational and AT purposes.

Economic activity associated with increased volumes of people includes more accommodations, more restaurants, more retail and service businesses, which results in more jobs and greater economic sustainability.

2.3 Community Vision for Active Transportation

The Town of Rothesay has expressed its intentions to improve opportunities for, and infrastructure related to, AT over the past several years. Two key documents outlining these intentions are the *Municipal Plan*, which was adopted in 2010 and the *Recreation Master Plan*, completed in 2009.

2.3.1 Municipal Plan 2010

The current municipal plan was adopted by Council in 2010 and is the central document providing town policies which create the framework for development in Rothesay. The plan embraces the concept of sustainable development and incorporates principles that reflect this concept and the context of the Rothesay community. It outlines goals and policies that promote a more visually attractive community, which provides better and safer options for AT and recreational walking and cycling. These goals are outlined on the following page.

Active Transportation Related Goals of the Municipal Plan	
Sustainable Development Goals	Promote pedestrian movement opportunities.
	Foster efficient land development.
	Promote energy efficiency.
	Minimize environmental impact.
Street Trees and Beautification Goals	Maintain and enhance Rothesay's reputation as a heavily treed community.
	Augment existing street trees through the addition of trees and other vegetation.
	Ensure that street trees are an integral component of newly developed areas.
	Significantly increase the number of street trees in the Hampton Road commercial district.
	Encourage beautification of the Hampton Road corridor.
Recreation Goals	Develop a linear trail system free from motorized vehicles, with linkages to neighbourhoods within Rothesay and to regional trail systems.
	Continue to acquire land for recreation and open space including taking the maximum permitted under the Act when land is being subdivided.
Transportation Goals	Acknowledge and support other modes and methods of transportation.
	In keeping with the principles of sustainable community development, any future development will be evaluated for its potential to encourage a higher degree of foot traffic or be accessible by bicycle.

2.3.2 Recreation Master Plan 2009

The Recreation Master Plan was created as a research driven document, producing recommendations and policies for the enhancement of leisure services in the Town of Rothesay. While the plan takes a broader view of recreation and leisure in Rothesay, it identifies AT and recreational walking and cycling as a key need in the community. The final recommendations proposed in the plan identify AT as an important form of recreation in the area and proposes improvements to the existing infrastructure. Key needs and policies from the plan are outlined on the following page.

2.3.3 Municipal By-Laws

While the bulk of the Town's goals and objectives for AT are laid out within the municipal plan and the recreation master plan, there are several municipal by-laws that contain policies and implementation tools which could help improve AT options in Rothesay. These include:

- The Zoning By-Law
- The Subdivision By-Law
- The Streets and Sidewalks By-law No. 5-03
- The Traffic By-Law No. 3-03

It may be in the Town's interests to review these by-laws to ensure that they are providing useful regulations for providing and improving bicycle parking, properly located and attractive

commercial parking areas, high quality landscaping, high quality lands for public purposes, street trees, safe and attractive streets and sidewalks, and urban design guidelines for setbacks and other architectural and site planning details.

Rothesay Recreation Master Plan
Active Transportation Needs and Recommendations

Active Transportation Needs Identified	Active Transportation Recommendations
Trail Needs: "Through the public open house and online survey, residents articulated a significant demand for the development of more trails which is consistent with national recreation trends which show an increased demand for trail development. As noted earlier, Rothesay has a limited formal trail system which includes a section of East Riverside Kingshurst Park, and Steele/Kennedy Nature Park; but opportunities exist to 'formalize' access to informal trails such as Renforth Bog and the lands for public purposes."	**Development Trail Projects: "**Trails are an important component of a recreation and parks system. Rothesay should focus on completing gaps through the extension and formalization of its existing trails into a town-wide system. More corridors should be acquired and trails developed to establish a more extensive off-street trail system. Where possible, connections should be made to popular destinations such as the river front; neighbourhood, community and regional recreation facilities."
	Promoting Sustainable Transportation: Indoor and outdoor facilities should be accessible by a wide variety of travel modes. This is achieved by locating facilities on major public transit routes, by connecting geographic hubs and other facilities by natural and hard surface trails, ensuring that the orientation of the facility on the site maximizes accessibility and safety, and by providing parking consistent with the demands of the specific facility components."
Cycling and Running Needs: "Community consultations revealed a significant need for the inclusion of cycling/running lanes as part of the road infrastructure in order to improve safety for active transportation users and leisure cyclists / runners. This need can be addressed through consideration and planning for all active transportation modes. This also highlights an opportunity for Rothesay to link to the Saint John bike path system (which is linking to Rothesay's boundary on Rothesay Road). Creating a supportive environment can help ensure that an active (healthy) choice is also an easy one. This is consistent with recreation trends and provincial and federal governments' programs and infrastructure initiatives to support active healthy living and active transportation."	**Active Transportation: "**Developing a municipal strategy for active transportation is a great way to motivate elected officials, staff and the public. An entire community can be energized by the process. A feasible, affordable strategy with a firm schedule and clear responsibilities is a catalyst for action. A cornerstone of active transportation is the development of bikeways. Planned bike lanes provide sufficient space to allow cyclists to operate safely rather than allotting whatever residual space is left over after vehicular traffic is accommodated, and encourages cyclists to operate in a manner consistent with the rules of the road."

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3 Existing Conditions

3.1 Community Profile

3.1.1 Population

The Town of Rothesay is primarily a residential community, with a population of approximately 12,000 people. Rothesay is located between the City of Saint John, a city of 70,000 and the Town of Quispamsis, a fast growing residential community of roughly 18,000. Rothesay is a stable community and has experienced population growth of 4.1% from 2001 to 2011.

Table 1 – Demographic and Geographic Characteristics (2011)

	Rothesay	Quispamsis	Saint John	Hampton	Grand Bay - Westfield
Population	11,950	17,886	70,063	4,292	5,117
Occupied Private Dwellings	4,542	6,174	30,757	1,621	1,894
Land Area Sq. KM	34.77	57.06	221.8	21	59.86
Population per Sq. KM	343.6	313.5	315.82	204.3	85.5
Population per Private Dwelling	2.6	2.9	2.3	2.6	2.7
Median Age	41.8	39.1	42.3	41.6	42.4

Source: Statistics Canada, Census Community Profiles 2011

As highlighted in **Table 1**, the Town of Rothesay, similar to the other surrounding residential communities in the region, has a higher number of people per private dwelling (2.6), than the City of Saint John (2.3) and the provincial average (2.2). This indicates that the Town of Rothesay is a community with a high proportion of families. Similarly, the adjacent Town of Quispamsis has the highest number of people per private dwelling (2.9), indicating that the Kennebecasis Valley contains an above average proportion of families with children.

As depicted in **Figure 1**, 18% of the population in Rothesay are children aged 0-14, while an additional 8.5% are in their teen years, aged 14-19. Comparatively, only 14.8% of Saint John and 15.1% of New Brunswick's population are aged 0-14.

Figure 1 – Population Age Distribution (2011)

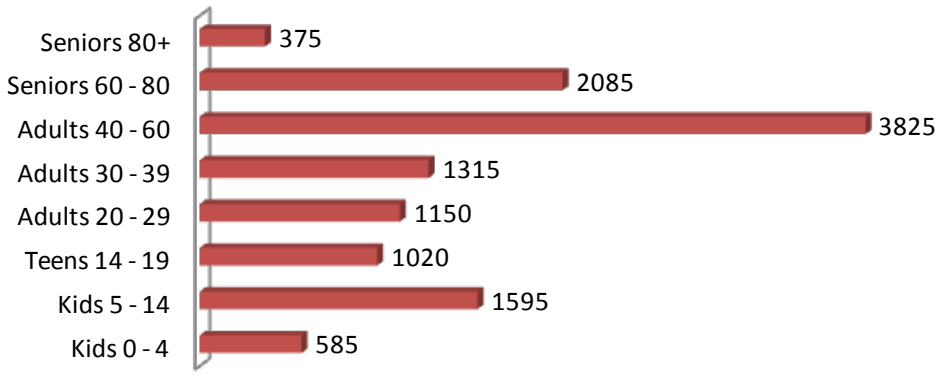
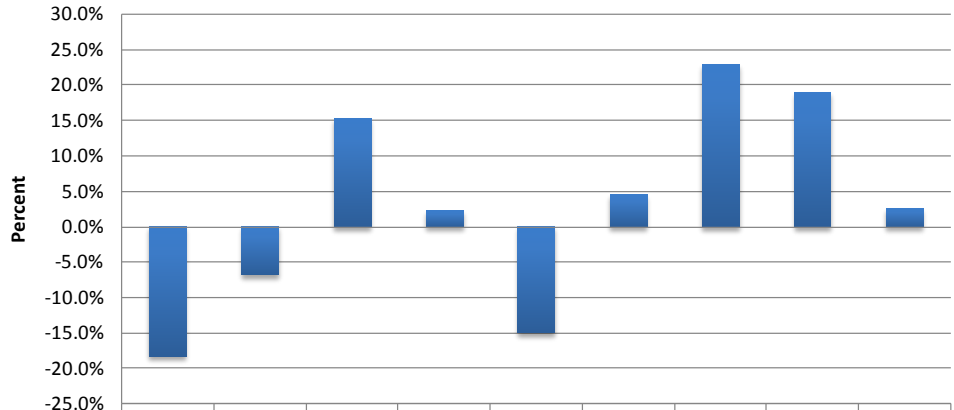


Figure 2 – Rothesay Population Change by Age Group (2006-2011)



	Kids 0 - 4	Kids 5 - 14	Teens 14 - 19	Adults 20 - 29	Adults 30 - 39	Adults 40 - 60	Seniors 60 - 80	Seniors 80+	Overall
Change 2006-11	-18.2%	-6.7%	15.3%	2.2%	-14.9%	4.5%	23.0%	19.0%	2.7%

While Rothesay is largely a community of families with children, the low level of population growth suggests that in recent years a lower proportion of young families have moved to the area than the neighbouring Town of Quispamsis. Therefore, Rothesay has a slightly higher proportion of older families with teenage children.

Another important consideration for Active Transportation is that Rothesay, like most communities is aging. The baby boom cohorts represent the single largest generation and are approaching their senior years. More than 50% of the population of the Town is now aged 40 and older. The median age of 41.8 reflects this and has increased since 2001, when it was 37.1. Despite this, Rothesay is still below the median age for the Saint John CMA (41.9) and the Province of New Brunswick (43.7).

In addition to age, the density of a community has a significant influence on population levels using active transportation. The higher the level of population and the more destinations concentrated in that same area, the more likely it is that commutes for work, personal errands and leisure are easily accessible on foot or by bicycle. At 34.77 square kilometres, Town of Rothesay is one of the more compact municipalities in the Saint John region.

3.1.2 Income and Education

In the past decade, researchers have identified income and education levels as being significant predictors of participation levels for physical activity. Communities with high income, education and social capital levels often provide supportive environments for engaging in physical activity[3].

As **Table 2** outlines, in 2006, average household income in the Town of Rothesay was approximately 60% higher than the New Brunswick average. Rothesay also had nearly twice the proportion of residents with a university degree and a low income rate of only 7.6%.

As these statistics indicate, Rothesay has both high levels of income and education, which are often associated with higher levels of community social capital and higher participation rate in physical activity.

Table 2 – Income and Education Levels (2006)

	Median Household Income	University Degree (25 and older)	Low Income rate
Rothesay	$71,186	27.2%	7.6%
NB Average	$45,194	14.2%	13.5%
Canada Average	$53,634	20.4%	15.3%

Source: Statistics Canada, Census Community Profiles 2006

3.1.3 Employment

The Town of Rothesay is primarily a residential community, with a mix of some commercial and light industry geared towards the servicing of the local residents. While Rothesay is not the centre of employment for the region, it is still a location of employment for some local residents and residents of neighbouring municipalities.

[3] *Trina Rickert; Joan Higgins.*2005 Exploring the Factors Associated with Sustaining Physical Activity in Individuals At-Risk for Type II Diabetes. *Canadian Association for Leisure Studies*

In 2007, employers in the region reported providing 2,579 jobs. Of these jobs, approximately 760 are filled by people from Rothesay and the rest by people from the neighbouring municipalities of Quispamsis and Saint John. The jobs located in Rothesay are largely in the service industry and primarily provide services locally to area residents.

3.1.4 Transportation to Work

Rothesay largely relies on Saint John as a centre for regional employment. This has implications for active transportation in the region, as the trip to work is one of the most frequent and consistent trips throughout the work week.

In 2006, 15% (760 people) of working age people worked within the Town of Rothesay. The other 85% worked outside of Rothesay, primarily in Saint John. This results in a large portion (96.4%) of residents commuting longer distances to Saint John by car. Only 2.6% reported walking or cycling to their place of work in 2006.

The quantity of people driving to work has likely decreased a small amount since 2006, as the introduction of the COMEX program in 2007 provided new transportation alternatives for people commuting to Saint John. The COMEX program has grown to two routes connecting the KV to uptown Saint John, providing 8 busses between 6:15 – 9:19 AM with a capacity of approximately 352 Riders and 9 busses between 3:25 – 6:24pm with a capacity of approximately 396 riders.

Table 3 – Transportation to Work (2006)

	Rothesay	Quispamsis	Saint John	Hampton	Grand Bay - Westfield
Place of Work 2006					
Worked in local municipality	15%	11%	96%	32%	12%
Worked outside local municipality	85%	89%	4%	68%	88%
Transportation to Work 2006					
By Car	96.4%	96.4%	78.1%	94.8%	94.3%
Public Transit	0.0%	0.5%	7.6%	0.0%	1.4%
Walked or Cycled	2.6%	2.2%	11.9%	4.7%	3.8%
Other Modes	1.0%	0.9%	2.4%	0.5%	0.5%

Source: Statistics Canada, Census Community Profiles 2006

3.1.5 Schools

Another important consideration regarding active transportation is providing a safe and efficient environment for children to travel to and from school. As a community and region of families, Rothesay and the Kennebecasis Valley are home to many schools. There are currently three elementary schools, two middle schools, one high school and a private school serving 2,733 students in the community. The numbers also indicate that there is significant overlap between the two communities of Rothesay and Quispamsis regarding schools. While nearly two thirds of the school aged population in the area live in Quispamsis, the Town of Rothesay has more schools and more students.

Table 4 – Schools in Rothesay and Quispamsis (2006)

Schools in Rothesay			Schools in Quispamsis		
School	**Grades**	**Pupil Enrolment**	**School**	**Grades**	**Pupil Enrolment**
Rothesay Elementary	K,1 - 5	519	Quispamsis Elementary	K,1 - 5	469
Fairvale Elementary	K,1 - 5	558	Lakefield Elementary	K,1 - 5	533
K-Park Elementary School	K,1 - 5	169	Quispamsis Middle School	6 - 8	532
Rothesay Park School	6 - 8	253	Kennebecasis Valley High	9 - 12	1108
Harry Miller Middle School	6 - 8	403			
Rothesay High School	9 - 12	581			
Rothesay Netherwood School	6 - 12	250			
Total Enrolment		**2733**	**Total Enrolment**		**2642**

Source: Department of Education, Summary Statistics Report 2011-2012

3.2 Land Use and Developments

3.2.1 Overview

The majority of developed lands in the Town of Rothesay are situated between the Kennebecasis River and Route 1. Development is largely ribbon in nature, extending off Rothesay Road, Hampton Road, and Gondola Point Road. Most of these lands comprise mature, low density residential neighbourhoods. Commercial areas are focused along Hampton Road, Marr Road, and Campbell Drive. South of Route 1, developed lands include the French Village and Barsa Subdivisions. All other land south of Route 1 is rural undeveloped land.

The Town's current land use map is shown in **Figure A.1** in **Appendix A** and also includes the locations of commercial, recreational, and institutional destinations. An understanding of popular destinations and their proximity to residential areas is an important aspect of AT network development and prioritization of

facilities. Descriptions of the residential areas in the Town and the various destination based land uses are provided below.

3.2.2 Residential Areas

Residential areas are considered the "origin" of most trips. The proximity of residential areas to popular destinations is an important part of active transportation and promotion of non-motorized travel.

In Rothesay, the residential areas in the former communities of Fairvale and Rothesay are located quite close to the major destinations such as commercial and employment centres, the middle and high schools, and recreational land uses. The majority of trips to these destinations are less than 3 km in length. There is also a dense network of streets that provides many points of access to Hampton Road and direct routes for walking and cycling. One major constraint in this area, however, is the CN Rail which creates a barrier for north-south filtration between the Fairvale area and Hampton Road. Establishing one or more public rail crossings should be a consideration in this Plan.

The residential areas in the former communities of Renforth and East Riverside-Kingshurst are located a considerable distance away from the Town Centre. Access to the Town Centre and other major destinations is provided by either Rothesay Road or Route 1. Rothesay Road is the only suitable route for non-motorized travel, but distances to the Town Centre range from 5-10 km. This could be considered an appropriate distance for bicycle trips and facilities should be provided along Rothesay Road to promote bicycle travel. This distance exceeds, however, what is reasonable for walking trips. Therefore, most pedestrian traffic on Rothesay Road is likely for trips between neighbourhoods, to more local destinations, and for the purposes of physical activity.

There are a number of community destinations located close to the Renforth and East Riverside-Kingshurst residential areas, including East Riverside Kingshurst Park, Riverside Golf Club, Renforth Park, J.M. Fitzgerald Memorial Field, the Anglican Church, K-Park Elementary School, and K-Park Beach. These are within a comfortable walking and cycling distance from the residential neighbourhoods and therefore opportunities should be explored for enhancing the neighbourhood connections, both through on-road and off-road facilities.

The residential areas south of Route 1 include French Village and Barsa subdivision. A large population resides in these areas (primarily in French Village), but is severely cut-off from the rest of Rothesay due to the barrier of Route 1 and the limited transportation connections. Route 111 is currently the only route between French Village and the rest of Rothesay. Due to high speeds and limited shoulder width on Route 111, it is not an attractive or suitable route for active transportation. Significant improvements are required, most likely in the form of a separated multi-use trail in order to attract the most users. Connections across Route 1 are being addressed, in part, by a walkway on the expanded Route 111 overpass, but a complete route needs to be established.

3.2.3 Key Destinations

Commercial and Light Industrial Land Uses

Commercial land uses are primarily centred along Hampton Road from Iona Avenue to Campbell Drive and in the Marr Road/Campbell Drive area, also referred to as Millennium Park.

The Hampton Road commercial area is considered to be the Town Centre of Rothesay. Commercial uses include restaurants, strip retail, service stations, and small offices. An objective of the *Municipal Plan* is to work with landowners to make Hampton Road a more aesthetically pleasing streetscape and an attractive environment for pedestrians. This includes policies to make the street more pedestrian-friendly by considering traffic calming devices in the public road right of way, a safe and convenient network of sidewalks, and adding amenities such as more greenery and litter containers. The provision of bike facilities should also be a consideration in the enhancement of Hampton Road, given that the street provides access to many employment, amenity, and recreation based destinations, and is a major through route for Rothesay and Quispamsis.

Millennium Park commercial area a major commercial plaza that features “box-style” stores including a supermarket, office supply store, hardware store, and movie theatre. There are also light industrial uses located along Marr Road north of Campbell Drive.

This area is strategically located to serve the local and regional population given its convenient access from Route 1 and Route 111; however, non-motorized access to the commercial plazas is very limited, despite the plazas being located very close to large residential neighbourhoods. Improving pedestrian and cyclist access to Millennium Park via both on-road and off-road facilities

should be a priority for the Town. The *Municipal Plan* supports this with two specific policies for Millennium Park:

- *(8.3.3.f) Council will require pedestrian pathways to be included in any design proposal such that there are adequate and appropriate connections between developments and residential properties.*

- *(8.3.3.g) Council will require that the trail system identified in the Recreation Master Plan (2009) be developed in this area. As well, Council will require that adequate green space be provided in association with the overall development of the lands.*

Public and Recreational Spaces

Two of the Town's most prominent public destinations are Rothesay Common and Rothesay Arena. The Town also owns and maintains several neighbourhood, community, and regional parks, which are listed in **Table 5**.

Rothesay Common is recognized as the civic focal point and gathering place of the Town of Rothesay. The Common features a large open park space that can be used for festivals and events, a playground, basketball courts (which serve as an outdoor ice rink in winter), and a track shared with Rothesay Park School. In addition to the school, bordering the Common are several churches, offices, a store and restaurant, post office, and bank.

Rothesay Arena is a major recreational destination in the Town and is also situated immediately adjacent to Rothesay High School, Harry Miller Middle School, and Rothesay Town Hall. This site may also be home to the future Rothesay Fieldhouse, which would significantly enhance this area as a major recreational and institutional destination.

Table 5 – Town of Rothesay Parks

Neighbourhood Parks	Community Parks	Regional Parks
Highland Ave Playground	East Riverside Kingshurst Park & Trail	Arthur Miller Fields
Donlyn Drive Playground	Fairvale Outing Association Ball Field	Bicentennial Park
Islay Drive Playground	James Renforth Wharf, Beach & Playground	
Stuart Dobbin Memorial Park	Jordan Miller Park & Beach	
Dobbin Street Playground	J.M. Fitzgerald Memorial Field	
Monaco Drive Playground	Kennebecasis Park Beach	
	Rothesay Common Park & Playground	
	Scribner Crescent Playground & Ball Field	
	Steele Kennedy Nature Park	
	Wells Recreation Park	

Neighbourhood Parks serve the people who live within a neighbourhood. They are developed to meet the interests of that population group and should be within walking distance of all sections of the neighbourhood. In Rothesay, these parks are located on local streets and given the small catchment area, no special AT facilities should be required to serve them.

Community Parks provide space for active and unstructured recreation for all age groups and usually serve more than one neighbourhood. They act as a major focus for each community often providing recreational facilities such as soccer fields, ball fields, playgrounds and tennis courts. In Rothesay, Community Parks are located off local and collector roadways and have a larger catchment area than neighbourhood parks. AT facilities should be considered to promote non-motorized travel to these parks.

Regional Parks provide space for active and unstructured recreation of all ages and include a wide range of specialized uses. A regional park serves the people who live within a larger region and may be a "tourist attraction" serving residents and visitors alike. In Rothesay, the two regional parks are located off collector and arterial roadways. AT facilities should be considered to promote non-motorized travel to these parks. It should be noted that non-motorized access to Bicentennial Park is currently very challenging due to the barriers of Route 1 and Route 111 and the lack of AT facilities.

Other Open Spaces for Public Purposes comprise undeveloped lands owned by the Town that are available for public use. These include strips of riverfront land around Kennebecasis Park Peninsula and adjacent to the rail line in Renforth as well as the large natural areas south of Route 1. In the *Recreation Master Plan*, many residents expressed a need for better access to these open spaces. Therefore, there is an opportunity to provide connections to these spaces as part of the AT network, or develop the lands themselves as AT corridors.

Schools

As described in Section 3.1.5, seven schools are located within the Town of Rothesay – three elementary schools, two middle schools, one high school, and one private school (refer to **Table 4**). A total of more than 2,700 students attend these schools. The elementary schools generally serve the surrounding neighbourhoods while the middle schools and high schools serve a town-wide or regional student population.

A discussion with school district staff revealed the following important points related to student travel and active transportation:

- Students living within 1.6 km of their school are not bussed and are expected to make alternative travel arrangements. This may include walking or cycling, but often it means parents drive the students to school.

- Maintaining direct routes to school with good facilities is important to encourage more students to walk. This may mean more sidewalks in subdivisions as well as more trails and bike paths. Trails and shortcuts are especially important and opportunities to formalize these connections should be explored.

- Most schools have bike racks, but this may be an area requiring improvement.

Based on a survey of Grade 12 students at Rothesay High School, a very low proportion of students walk or cycle to school.

Developing and enhancing AT facilities for routes to school is an important consideration in this AT plan.

3.3 Transportation Network

3.3.1 Roadway Infrastructure

Approximately 160 km of roads are located within the Town's municipal boundaries. These include all municipally owned streets as well as a number of provincial highways and private lanes. All roadways are summarized by roadway class in **Table 6**. A road network map is provided in **Figure A.2** in **Appendix A.**

Table 6 – Summary of Roadways within Rothesay

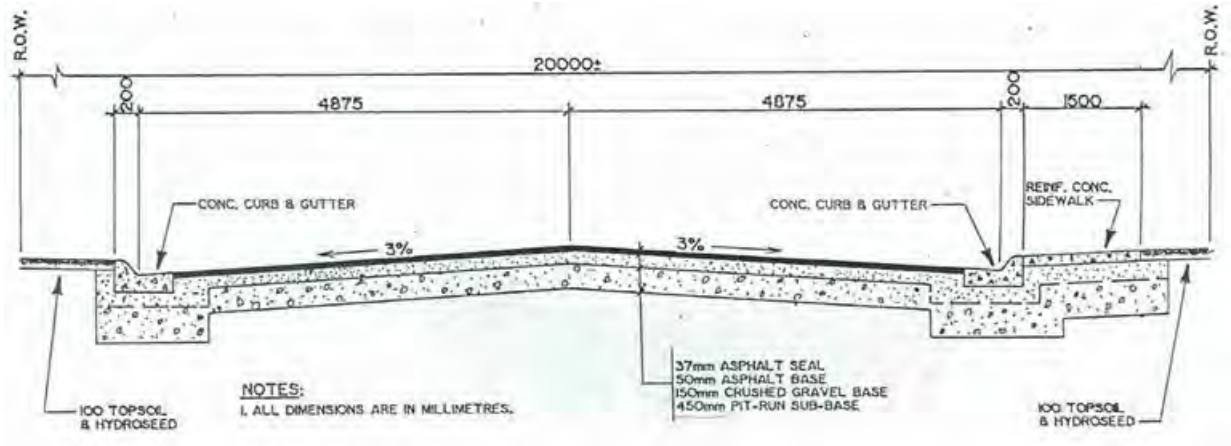
Road Classification	# of Roads	# of Km
Provincial Arterial	1	20
Provincial Collector	5	16
Provincial Local	2	2
Municipal Collector	11	18
Municipal Local	278	98
Private	35	7
Total	**333**	**160**

Most roadways feature two-lane cross-sections. The only exceptions are Route 1, a divided freeway, and Hampton Road

through the commercial district where a three-lane cross-section is provided.

Municipal Collector Streets in Rothesay feature an urban cross section with curb and gutter and sidewalk on at least one side. The minimum width required for a municipal collector street is 9.7m curb to curb. Most collector streets do not exceed this minimum width. The standard design cross-section for a Municipal Collector Street in Rothesay is shown in **Figure 3**.

Figure 3 – Typical Residential Street Design Standard



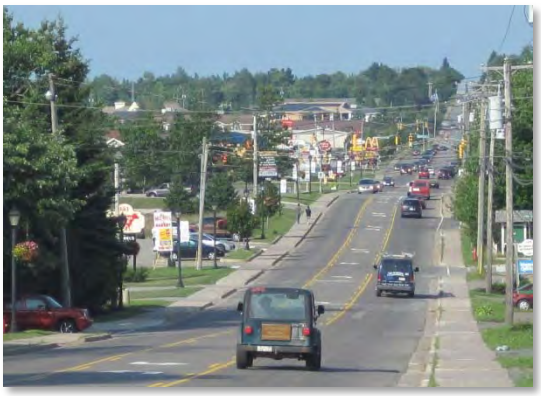
A description of provincial highways and key municipal corridors is provided below:

- **Route 1** is a four-lane divided provincial arterial highway and the primary travel and trade route through southern New Brunswick. Route 1 has a speed limit of 110 km/h and is one of the busiest highway sections in the Province, carrying a significant volume of commuter traffic between communities in the Kennebecasis Valley and Saint John.

  Due to the high speeds and heavy traffic volumes on Route 1, it is not an appropriate facility for active transportation.

- **Route 111** is a two-lane undivided provincial collector highway, providing access between Route 1 and the Saint John Airport. It also serves as primary connection to Route 1 from various areas of Rothesay. The speed limit on Route 111 ranges from 50 to 100 km/h.

Currently, Route 111 is the only route linking French Village to the rest of Rothesay. Walking and biking along the shoulder of Route 111 is not desirable due to the high speeds and traffic volumes and narrow paved shoulder available. An objective in this study is to identify an appropriate upgrade or alternative route to facilitate active transportation movements from French Village and across Route 1 to the rest of Rothesay.



- **Route 100 (Rothesay Road/Hampton Road)** is an undivided provincial collector highway that at one time served as the main highway through the Kennebecasis Valley.

  Route 100 is designed with an urban cross section and features speed limits ranging from 40 km/h to 60 km/h. Although Route 100 is a lower speed road and serves, in large part, a local access function, many users still treat this route as a thruway and opt to travel on it versus Route 1 for commuting and regional trips.

  Rothesay Road and Hampton Road are also the primary travel corridors through the heart of Rothesay, providing access to many residential, commercial, institutional and recreational land uses. Rothesay Road provides spectacular views of the Kennebecasis River, making it an attractive route for drivers, cyclists, runners, and walkers. For the above reasons, Rothesay Road and Hampton Road are considered to be critical routes for AT movements and therefore should be considered for designated AT facilities.

  Although Route 100 is maintained by the Town and has the appearance of a community route, it remains a designated provincial highway and therefore any changes to the route should be discussed with the New Brunswick Department of Transportation and Infrastructure (NBDTI).

- **Route 860 (French Village Road)** is a two lane provincial collector highway that serves as the primary corridor through French Village with a connection to Route 111. Route 860 also connects to Dolan Road in the south and to various other rural local highways to the north beyond the Town boundary.

  Within the Town, Route 860 features a mix of urban and rural cross-sections and speed limits ranging from 50 to

60 km/h. Route 860 serves a large residential area and therefore should be considered as a designated route for active transportation.

- **Campbell Drive** is a two lane provincial collector road that connects Route 111 to Hampton Road. Campbell Drive currently features a rural cross-section with narrow paved shoulders and no curb and gutter. With a speed limit of 70 km/h and controlled access, Campbell Drive facilitates higher speed traffic movements to key nodes such as the Route 111/Route 1 interchange and the Millennium park commercial centre.

  Campbell Drive presents an opportunity for an AT link from Hampton Road to Grove Avenue, with intermediate access to the commercial centre and other potential AT corridors. The potential for a formal trail along the Hillside Watermain access road would also connect conveniently to Campbell Drive. Upgrades to Campbell Drive would be required due to the limited shoulder width and considering the higher traffic speeds and volumes. Because Campbell Drive is provincially classified as a Bypass Highway, any changes would require approval from NBDTI.

- **Millennium Drive** is a two lane municipal collector street that parallels Route 1 and connects Rothesay to Quispamsis. Millennium Drive was constructed to open up access to developable lands and to provide an alternative route to Hampton Road between the communities. While lands along Millennium Drive have been steadily developing in Quispamsis, the adjacent lands in Rothesay are largely undeveloped.

  Millennium Drive features a rural cross-section with a 60 km/h speed limit. There is an opportunity to designate Millennium Drive as an AT route, connecting the Quispamsis AT network to Rothesay's network on Campbell Drive.

- **Marr Road/Clark Road** is a two lane municipal collector street that provides access to residential and commercial areas through the heart of Rothesay and connects Gondola Point Road, Hampton Road, and Campbell Drive.

  Because of the central location of Marr Road and Clark Road and the connections provided to key nodes and land uses, these streets should be considered for primary AT

routes. Grades are somewhat steep, reaching an estimated 6-7% in some sections. The grades are not long, but rest areas, with benches for example, should be a consideration at the top of these grades.

- **Grove Avenue** is a two lane municipal collector street connecting Campbell Drive to Hampton Road, with access provided to Highland Road and adjacent residential neighbourhoods. The street features a curbed cross-section with sidewalk on one side.

  Traffic volumes are relatively low on Grove Avenue, but it is anticipated that traffic volumes will increase to some degree when intersection improvements are made to the Campbell Drive/Route 111 intersection.

  Grove Avenue should be considered as an AT route as it links Hampton Road and Rothesay Common to potential AT routes on Campbell Drive and the Hillside Watermain Access Road. Grove Avenue features a long uphill grade of approximately 4%. This is within an acceptable range for an AT facility, but rest areas should be a consideration.

- **Fox Farm Road** is a two lane provincial primary local roadway. Its classification as a provincial roadway is due to the fact that it is a direct connection between Route 100 and the Route 1 interchange. Fox Farm Road also provides access to a number of residential streets.

  Fox Farm Road has a curbed cross-section with sidewalk on one side. The average grade on Fox Farm Road is an estimated 7% over 500m, with some short sections reaching 10% or higher. These grades are somewhat prohibitive or uncomfortable to the average cyclist or pedestrian, but Fox Farm still has a role to play in the AT network, connecting nearby subdivisions to other AT corridors.

  Currently, Fox Farm Road would serve primarily neighbourhood AT movements, connecting the adjacent residential areas to Rothesay Road. In the future there may be potential for connections to a potential Hillside Trail or to Saint John's Trail System at Spectacle Lake.

- **Gondola Point Road** is a two lane collector street continuing from Rothesay Road at Rothesay Common to Quispamsis. Gondola Point Road serves primarily

residential areas, but also provides access to Fairvale Elementary School and services a high volume of commuter traffic. A significant portion of the commuter traffic on Gondola Point Road originates from Quispamsis via Vincent Road.

Within the Town of Rothesay, Gondola Point Road has a curbed cross section, sidewalk on one side throughout, and in some sections, sidewalk on both sides. The roadway follows rolling topography and features several short sections of grades ranging from 5-8%. These present a more challenging route for AT users, but are not outside acceptable limits. Rest areas should be a consideration at the top of the longest and steepest grades.

Gondola Point Road features Sharrows and *Share the Road* Signage, making it the only road in the Town with a cycling facility treatment. Opportunities will be explored to enhance AT facilities along Gondola Point Road and to address sections with barriers or constraints.

- **Vincent Road** is a two lane collector street extending from Gondola Point Road to the Quispamsis Town boundary. Vincent Road primarily serves residential areas and feeds a significant volume of commuter traffic from Quispamsis into Rothesay – traffic that is most likely destined for Saint John.

Vincent Road has a curbed cross-section and sidewalk on one side. Vincent Road (within Quispamsis boundaries) was identified in the *Quispamsis Active Transportation Plan* as an AT Collector Street, featuring Shared Route signage and Sharrow pavement markings. The AT facilities should be extended from the Quispamsis boundary to Gondola Point Road.

3.3.2 Traffic and Truck Volumes

An extensive traffic volume count program was carried out in spring 2012 as part of the Rothesay Traffic Study. The counts were completed at 13 intersection locations during peak weekday travel hours (7 am to 9 am, 11:30 am to 1:30 pm and 4:00 pm to 6:00 pm). These counts were used to determine peak hour traffic flows throughout the Town and to produce estimates of Average Annual Daily Traffic (AADT) volumes. Truck counts were also obtained as well as pedestrian and cyclist counts at selected

locations. Saturday counts were also completed at several intersections along Hampton Road to capture weekend peak hour conditions.

An understanding of traffic and truck volumes is important when identifying AT routes and designing for on-road AT facilities. Ideally, higher volume roadways that are designated as AT routes, should have higher standard AT facilities (e.g. bike lanes, sidewalks, wide shoulders, etc.).

The AADT volumes and truck volumes (expressed as % AADT) are listed in **Table 7** for all arterial and collector roadways in Rothesay. AADT volumes and estimated daily truck volumes are also mapped in **Figure A.3** and **Figure A.4** in **Appendix A**.

Table 7 – Daily Traffic and Truck Volumes in Rothesay

Roadway	AADT Volume	% Trucks
Campbell Drive	3,100 - 19,500	2.3%
Church Avenue	2,200	1.7%
Clark Road	9,300 - 9,900	1.6%
Fox Farm Road	2,800 - 4,500	1.6%
French Village Rd	5,700	5.2%
Gondola Point Road	3,400 - 14,100	2.0%
Grove Avenue	3,100 - 3,500	2.1%
Hampton Road	9,000 - 19,300	1.7%
Marr Road	10,400 - 10,700	2.5%
Millennium Drive	8,100	3.1%
Rothesay Road	10,400 - 13,900	1.5%
Route 1	23,700 - 39,400	5.5%
Route 111	11,900 - 21,000	2.8%
Vincent Road	7,000	2.6%

3.3.3 Transit Service

Comex (Community Express) is a bus rapid transit service that provides express morning and evening service to commuters in outlying areas to and from Uptown Saint John. Comex operates on three routes, serving residents of Grand Bay-Westfield, Rothesay, Quispamsis and Hampton from Monday to Friday. The service began in September 2007 and was renewed in 2009 with funding commitments from the participating municipalities.

Route #52 provides service to the Kennebecasis Valley. The following stops are made in Rothesay:

- Rothesay Road @ Kennebecasis Park Entrance;
- Rothesay Road @ Riverside Golf Course;
- Church Avenue @ Gondola Point Road; and
- Hampton Road @ Rothesay High School.

Based on discussions with Saint John Transit staff, the High School stop is the most popular stop on the line. Buses are equipped with bike racks and some riders make use of this option.

Transit staff indicated that they receive regular requests for additional stops to be added to the route, but these requests must be evaluated carefully. Additional stops may be convenient for new users, but increase trip times for existing users and weakens the *express* function of the service.

In recent years, the option of adding a Comex express service from Millennium Park off Campbell Drive to the Saint John Regional Hospital was assessed. Although this option was ultimately not supported by Hospital staff, Transit staff feel there is still a significant demand for an express service from the Valley to the University/Hospital area.

3.3.4 Pedestrian and Cyclist Facilities

Sidewalks

The Town has a total of over 27,000 metres of sidewalk. Nearly all sidewalks are constructed with concrete. Most are located directly adjacent to the roadway curb, but there are some roadway sections that provide a boulevard separation, such as on Hampton Road near the High School and on Highland Avenue.

Nearly 80% of the Town's sidewalks have a width of 1.5m which meets minimum recommended standards. Approximately 20% of the sidewalks have a width of 1.2m and the remaining 1% has a width of 2.0 m. The 2.0m wide sidewalks are all located on Sierra Avenue, where the sidewalks were recently reconstructed.

The Town is moving toward a standard of 1.8m wide sidewalks when the sidewalk is immediately adjacent to the curb.

Streets with the 1.2m sidewalks are listed in **Table 8** including the length of sidewalk. These should be considered for widening when opportunities are available for reconstruction/replacement.

Table 8 – Streets with 1.2m Sidewalk

Street	Length of Sidewalk 1.2m Wide
Charles Crescent	852 m
Clermont Lane	90 m
Hampton Road	1,123 m
Highland Avenue	1,999 m
Hillcrest Drive	594 m
Kingswood Avenue	342 m
McMackin Lane	209 m
Robertson Drive	98 m
Wright Lane	139 m
Total	**5,446 m**

Pedestrian Crossings

Pedestrian crossing facilities generally fall into the following four categories:

- Signed and Marked Crosswalk
- Flashing (RA-5) Crosswalk
- Half Signal (pedestrian activates red lights to stop traffic); and
- Signalized Crossings at a Full Traffic Signal.

All crossing treatments but the Pedestrian Signal can be found in the Town of Rothesay. Pedestrian crossing locations and the treatment provided are shown on the Sidewalk Map in **Figure A.5** in **Appendix A**.

Over recent years, the Town has invested in upgrading a number of crossings to have RA-5 treatments. There are currently eight RA-5 crossings in the Town, with an additional two planned to be added in 2012/2013.

Protected pedestrian crossings are also provided at fully signalized intersections at Hampton Road/Marr Road, Hampton Road/Oakville Lane, and Marr Road/Campbell Drive.

All RA-5 and fully signalized crossings are equipped with accessible pedestrian signals and audible tones or messages notifying pedestrians when it is appropriate to cross the street.

It is Town practice to provide paraplegic ramps at all sidewalks leading to a crosswalk or intersection crossing.

Cycling Infrastructure

Given that the bicycle is a recognized roadway vehicle and is permitted to travel on most types of roadways, all municipal streets technically provide infrastructure for cycling; however, the only treatments in Rothesay specifically targeted to cyclists are the Sharrows and *Share the Road* signage on Gondola Point Road. These symbols and signs reinforce to users that the roadway is to be shared by both motor vehicles and cyclists.

Trails

The Town has three formalized trail systems as well as a number of informal short trail connections within neighbourhoods. The formal trail systems serve a recreational purpose and are described as multipurpose, although they are generally narrower than a standard multi-use trail. The trail systems are located in the following parks and together combine for 3.4 km of trails:

- Riverside-East Kingshurst Trail (0.9 km);
- Steele-Kennedy Trail (1.3 km); and
- Bicentennial Trail (1.2 km).

The informal trail connections within neighbourhoods serve an important function in terms of community connectivity and pedestrian and cyclist movements. Some examples of existing neighbourhood trail connections (within a right-of-way) include:

- Cove Crescent to Gondola Point Road (50 m);
- Dobbin Street to Sierra Drive (100 m);
- Sprucewood Avenue to Spruce Street (75 m);
- Spruce Street to Harry Miller School (75 m);
- Holland Drive to Chapel Road (100 m);
- Charles Crescent to Colonsay Place (60 m); and
- Fernwood Lane to Highland Avenue (80 m).

Although not a formal and public trail, the Hillside Watermain access road resembles a wide multi-use trail and potentially could be upgraded with a better surface to serve that purpose for the public.

3.3.5 Railway

A Canadian National (CN) rail corridor extends from Saint John to Moncton and is part of the CN North America rail network. The CN corridor passes through Rothesay for a distance of 7.7 km from the Saint John boundary to the Quispamsis boundary.

The rail line serves freight traffic only. Much of the rail traffic through Rothesay is related to the potash mine operations in the Sussex area. Currently, four trains per day operate on this line, but this is expected to increase as mining operations expand in Sussex.

From the Saint John boundary to Clark Road, the rail line follows the riverfront, passing through mature residential areas. There are many public and private rail crossings throughout this section. East of Clark Road, the rail line turns inland, passing to the south of the Fairvale area as it heads toward Quispamsis. No formal public or private rail crossings are provided over the 1.5 km distance between Clark Road and the Quispamsis boundary.

Although an important piece of the transportation network and economic fabric of southern New Brunswick, the CN rail line is a major barrier for the community in Rothesay. It limits access to the riverfront, separates neighbourhoods, and prohibits improvements to Rothesay Road. The lack of rail crossings east of Clark Road significantly limits north-south mobility between the residential area of Fairvale and the Town Centre along Hampton Road. This is a challenge for active transportation that needs to be addressed. Although previous plans have noted the possibility of the complete realignment of the CN line further inland, the likelihood of this occurring in any foreseeable future is remote, given the sheer cost of such a venture.

From the active transportation perspective the one opportunity that the active rail line does provide, is a cleared corridor that may be used for a multi-use pathway, or alternatively a pathway that follows the corridor immediately outside the right-of-way. This is discussed further in **Section 5.3**.

4 Community Consultation

4.1 Overview

A consultation program was launched in the early phases of this study to gather public and stakeholder input on active transportation in Rothesay, including the deficiencies, challenges, and suggestions for improvements. The consultation program consisted of the following elements:

- Stakeholder Consultation
- Public Open House
- Student Audit
- Active Audit

Each of these is described below. Copies of consultation materials are provided in **Appendix B**.

4.2 Stakeholder Consultation

Meetings and interviews were held with several internal and external stakeholders in order to understand the issues facing various local user groups and the opportunities to coordinate with regional efforts.

The stakeholders with whom initial consultations were held include:

- Town Planning, Recreation, and Engineering Staff;
- School District 6 (now Anglophone South District);
- Local cyclists;
- New Brunswick Trails Council Inc.;
- Saint John Transit; and
- Rothesay Police.

The results of the stakeholder meetings formed the basis of many of the recommendations in this plan.

4.3 Public Open House

A public open house was held on June 20th, 2012. The purpose of the Open House was to discuss the plan objectives with residents and receive their concerns and suggestions for active transportation improvements. It is estimated that approximately 50 people attended the Open House. Comments sheets were provided for participants to list their concerns and suggestions.

"Visual Preference Survey" boards were also displayed, where residents could vote on various infrastructure treatments based on the visual/physical appeal.

Summary of Comments

Public input was constructive and positive. Many expressed appreciation for a plan to be moving forward. The majority of public comments were related to bicycling. A summary of written comments received from the comment sheets is provided in **Appendix B**. Some common concerns/suggestions are listed below in order of frequency.

Common Concerns Expressed at Public Open House

1. **Wider Shoulders on Key Routes** – The shoulder on Millennium Drive and Campbell Drive is felt by many to be too narrow. Cyclists spoke of near misses or incidents with vehicles due to limited space. Many suggested paving the shoulder on these roadways to provide a safer space for cyclists. Similar concerns were expressed for Route 111 between Route 1 and French Village Road; however, for Route 111 there were mixed opinions on whether to pave the shoulders or construct a separated multi-use path.
2. **Bicycle Lanes/Shared Lanes** – General concerns were expressed regarding the need for more marked and signed bicycle facilities, particularly along Rothesay Road. Many felt that the markings and signage used on Gondola Point Road would be suitable if space is not available for dedicated bike lanes.
3. **Hillside Trail** – Many people would like to see the access road over the new waterline turned into a formal trail, with potential for future connection to Fox Farm Road. The trail should be surfaced with at least a finer granular material and parking is needed on Grove Avenue.
4. **Public Awareness** – A common comment was the need for more driver education and public awareness regarding active modes of transportation. Suggestions included campaigns and more cycling/running events in the Valley.
5. **Maintenance** – Maintenance was also a common concern, with two items in particular – 1) potholes/dropped catch basins and 2) the need for more frequent street sweeping. Much of the frustration regarding street sweeping seemed to be focused on the Brookville area of Rothesay Road where the new bike lanes were installed. The rocks that gather in this area are sharp and can puncture tires. Although this location is outside the Town limits, the comments should be a consideration for the Town, particularly for roads that become designated as AT routes.
6. **Transit** – There were several comments regarding a need for more Comex routes in the Valley. Some felt the option for a route to the Hospital/University should be revisited.

Visual Preference Survey

The Visual Preference Survey consisted of two large boards with various photos showing transportation facilities and amenities across a wide range of categories. Categories included bike facilities, sidewalks, bike racks, crosswalks, street corridors, streetscaping, and intersections. Approximately 10 images were

shown for each category. Participants at the Open House were asked to vote on their favourite images.

Figure 4 shows the 10 images that received the most votes across all categories. The size of the individual image within the collage represents its level of preference.

The two images that received overwhelmingly the most votes were paved multi-use trails. Both images show wide paved trails in natural settings that are completely separated from roadways. There is clearly a strong preference for multi-use pathways, but well marked bike lanes and paved shoulders were also popular.

In general, the major design elements that are desired by the public seem to have an underlying concept of providing well designed space for cyclists and pedestrians. These entail:

- Designated facilities that are physically or visually separated from other modes of transportation and provide ample space for movements;
- Routes for cyclist and pedestrians that are in close proximity to nature and are properly maintained to be inviting and provide space for individuals to rest;
- Streetscape elements (e.g. greenery, bike racks, and benches) that have an aesthetic appeal, but remain functional and accessible for all individuals.

Figure 4 – Most Popular Images in the Public Visual Preference Survey

4.4 Student Audit

The Student Audit was an effort to engage high school students in identifying AT barriers and propose ideas to remove these barriers. A questionnaire was developed for a class of Grade 12 students that included two components. The first component asked how students travelled to school and other activities and what issues or improvements might cause them to choose active modes of travel. The second component was a walking audit survey of routes surrounding the high school.

Student Travel Behaviour

In the first part of the questionnaire, students were asked the following questions:

1. How do you normally travel to school?
2. How do you normally travel to after school activities?
3. If you did not select active modes, what are the reasons?
4. What features or facilities might make you choose to walk or bicycle more often?

Fourteen responses were received for this part of the survey. The results are summarized in the pie charts in **Figure 5**.

The majority of students indicate that they drive to school (53%) and drive to after school activities (75%). A few students walk or take the bus, but none indicated that they bicycle. The most common reason for not choosing active modes was that the distance was too far (43%). Other reasons included inconvenience, safety concerns, and lack of a direct route.

The most common suggestion for improving the potential for walking or cycling was more direct or shorter routes (38%). Other suggestions included bike lanes, more sidewalks, better crossings, and more greenery.

Student Walking Audit

For the Student Walking Audit, students were asked to walk routes they commonly travel and comment on AT features in a questionnaire. Eleven questionnaire responses were received. All routes began or ended at the high school and origins/destinations included the student's home, Java Moose, Tim Hortons, Sobeys and Arthur Miller Fields. Common corridors were Hampton Road, Clark Road, Gondola Point Road, Highland Avenue, Sprucewood Avenue, Spruce Street, and Scott Avenue. Several trails were

also travelled, including the Steele-Kenney trails, and the short Sprucewood Avenue and Spruce Street pathways.

Generally the responses indicated positive feedback on the routes from walking perspective. Most students indicated that they felt safe or very safe. Other positive items included:

- Few areas without sidewalks or having sidewalks in poor condition;
- Nice homes, trees, and greenery along routes; and
- Frequent street crossing opportunities.

Some negative items included:

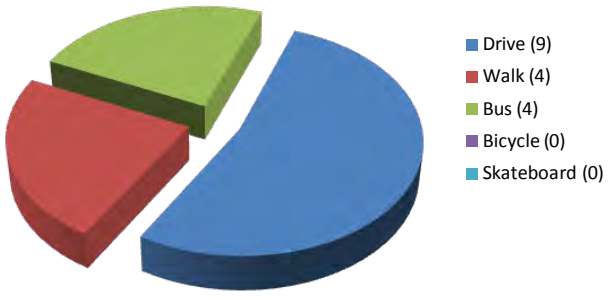
- Lack of amenities, nice storefronts, and public art; and
- Fast moving traffic and traffic/noise pollution.

Specific additional concerns included difficulty crossing Gondola Point Road and Clark Road as well as a need throughout the Town for public art from local artists.

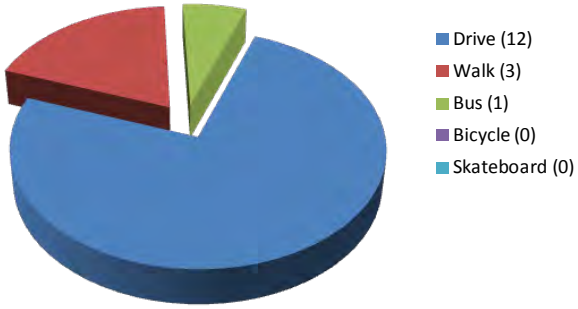
A summary of responses is provided in **Table 9**.

Figure 5 – Student Responses to Travel Behaviour

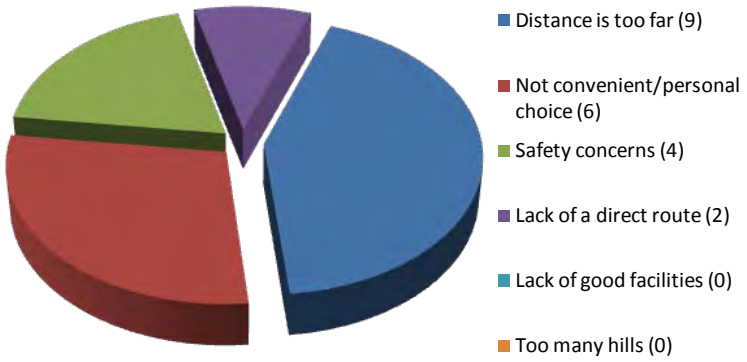
How do you normally get to school?



How do you normally get to after school activities?



If you did not travel by active modes, what are the reasons?



What features or facilities might make you choose to walk or bicycle more often?

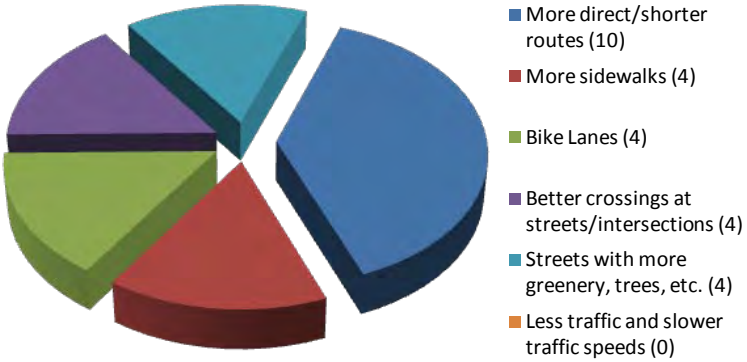


Table 9 – Responses to Student Walking Audit

Survey Question	Most Common Response
How often on your walk did you see the following features?	
No sidewalk or paved path	Never-Sometimes
Broken sidewalks	Never
Sidewalks or paths entirely blocked	Never
Sidewalks or path partially blocked	Never
Hill or steep incline	Sometimes
Construction/road works	Never-Sometimes
Stairs	Never
Were any of the following features on the roads you crossed?	
Marked crosswalks	Never-Sometimes
Controllable pedestrian signals	Never-Sometimes
Automatic pedestrian signals	Never-Sometimes
Many lanes/ wide road	Never-Sometimes
Insufficient crossing time	Never
Too much traffic	Never-Sometimes
Fast moving traffic	Sometimes
Things blocking my view of the street	Never
Inconsiderate/dangerous drivers	Sometimes
High curb/drop onto street	Never
Were any of the following amenities present along the route?	
Sheltered area	Never
Public restrooms	Never
Drinking fountain	Never
Public transport stop/station	Never-Sometimes
Benches	Never
Nice Homes or Buildings	Sometimes-Often
Trees	Sometimes-Often
Nice gardens/green areas	Sometimes-Often
Nice shop fronts	Never-Sometimes
Water features	Never
Public Artwork/sculptures/murals	Never
Traffic noise/pollution	Never-Sometimes
Shade	Sometimes
How often did you see:	
Neighbourhood watch signs	Never
Street lamps	Often
Scary/unfriendly people	Never
Other people my age walking	Sometimes
Other people (not my age) walking	Sometimes-Often
Litter/graffiti	Never-Sometimes
Scary/unfriendly dogs	Never

4.5 **Active Audit**

An "Active Audit" was held on Saturday, July 7, 2012. The public were invited to join the **exp** team in walking, biking, and running five routes in Rothesay. The purpose of the Active Audit was to generate discussion based on the user experience and to promote physical activity.

The five routes for the Active Audit began and ended at the Rothesay Arena and varied in length, setting, and difficulty. The routes encompassed many of the key corridors in Rothesay, including Hampton Road, Rothesay Road, Gondola Point Road, Marr Road, Grove Avenue, and Campbell Drive. The Hillside Water Main access road and other short trail connections were also included.

A wide range of users participated, including walkers, runners and bikers of all ages. Following completion of the routes, participants met back at the arena for a debriefing of observations and suggestions for improving AT conditions in Rothesay. Participants were also given a questionnaire to fill out.

Some of the comments and suggestions received from the Active Audit are summarized below. A complete list of comments is provided in **Appendix B**.

Concerns from Active Audit	Opportunities and Suggestions
• Steady, fast moving traffic on Hampton Road, Rothesay Road, and Campbell Drive. • Lack of markings, signage, and space for cyclists. • Crossing the busier streets can be difficult. • Sidewalks that switch from one side of the road to the other require multiple crossings by pedestrians • Potholes, curb and gutter with broken pavement edges, and gravel on the roadway are dangerous for cycling. • Lack of pedestrian crossings at signalized intersections on Campbell Drive. • No bike racks at Campbell Drive retail area.	• Enjoyable routes with beautiful properties, scenic views, interesting topography, and tree canopies. • The Hillside Water Main Road offers a great opportunity for a trail. • Need dedicated bike lanes and wider shoulders on busier routes, where possible. • Need more separated trails/bikeways and trail linkages. Trails should also have loops and be well marked. • Short trail connections between neighbourhoods are wonderful assets that should be promoted more. • Reduce speed limit on Rothesay Road from 60 km/h to 50 km/h. • Need to promote cycling more to increase awareness in the community.

5 Facility Design Tools

5.1 Network Development Principles

5.1.1 User Types

Understanding the various types of potential active transportation users is important when establishing the AT routes and facility types. Descriptions of common cyclist and pedestrian user types are described below.

Types of Cyclists

Cyclists are defined as those using a self-propelled bicycle can be described as fitting into one of the following four categories[4]:

- **Inexperienced** – includes children who are learning to ride a bicycle, and youth, adults, and seniors who have never learned to ride a bicycle or learned when they were younger and have forgotten.
- **Casual** – includes users of all ages who ride occasionally for fun or transportation, often with limited cycling skills and/or cyclist confidence.
- **Recreational** – includes users of all ages and skill levels who ride almost exclusively for recreation. This group also includes touring cyclists from different parts of the province, country or world.
- **Utilitarian** – typically experienced to very experienced cyclists who ride regularly, sometimes as their primary or only mode of transportation. Utilitarian cyclists are typically quite confident in their cycling abilities and are comfortable riding at higher speeds and along with vehicles on streets.

Two important considerations when targeting a user group are:

1. The "casual and less confident" group includes a majority of the population. These riders generally prefer separated pathways or bike lanes on low-volume, low-speed streets. Travel speeds are often lower (8-12 mph) and cycling distances are shorter (1 to 5 miles)[5].

[4] *Cape Breton Regional Municipality Active Transportation Plan*, IBI Group, 2008
[5] *Guideline for the Development of Bicycle Facilities, Fourth Edition*, American Association of State Highway and Transportation Officials, 2012.

2. The very experienced cyclists sometimes do not like dedicated or separated cycling facilities as they feel it impairs their right to ride directly in vehicle travel lanes. It is important to reinforce to experienced users that the AT network is being built for the less experienced users and to encourage more bicycle use, which gives cycling a higher profile and ultimately benefits all cyclists.

Types of Pedestrians

Pedestrians include both residents and tourists and generally fall into one of the following four categories:

- **Walkers** includes casual or occasional walkers, recreational walkers, or utilitarian walkers who either choose walking as their mode of travel or are forced to use walking as their mode of travel. Walking trips tend to be 2.5 km or less, or the equivalent of a 30-min trip. Because walkers are slower, they tend to be observant and aware of their environment.
- **Runners and Joggers** are typically participating in fitness. They will travel further than walkers but are more particular about the design, condition and surfacing of pedestrian facilities.
- **Mobility Restricted Users** includes users who depend on mobility aids such as canes, walkers, scooters, or wheelchairs. They require special design consideration, such as universal access.
- **Other Small-Wheeled Users** includes skateboarders, in-line skaters, or parents pushing strollers.

Other important considerations regarding pedestrian behavior are:

- **Pedestrians often seek the most direct routes** – As pedestrian travel is so much slower than other modes of travel, barriers and indirect routes can be major deterrents to walking.
- **Pedestrians often take "informal" routes** – In contrast to automobiles, and bicycles to some extent, which require roads and trails, pedestrians can and often do, use short cuts such as alleyways, parking lots, parks, wooded areas, or yards.

Identifying short cuts and formalizing them as pedestrian connections can be very beneficial to the AT network.

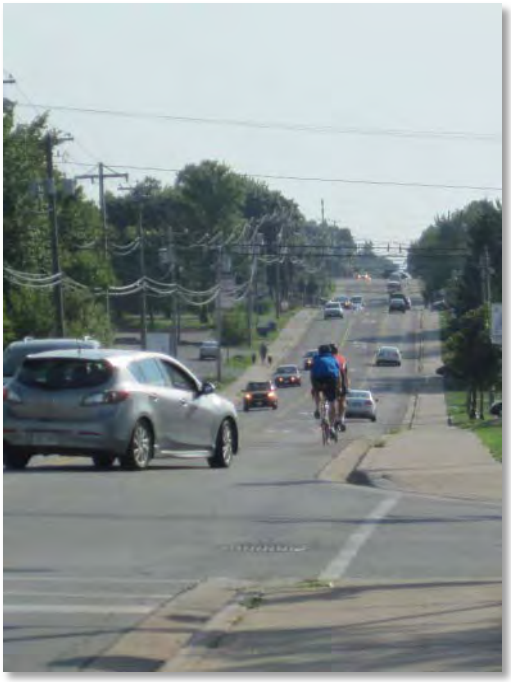
5.1.2 Hierarchal Network

An AT Network should feature a hierarchy of routes and facilities that is representative of each route's function and role in the overall network. The proposed AT Network comprises primary and secondary AT routes on both roadway and off-roadway facilities. These route types are described as follows:

- **Primary AT Routes** form the backbone of the AT Network, offering opportunities to move throughout the entire town and between neighbouring communities. Primary AT Routes also aim to connect major residential areas to prominent destinations. The Primary Route system consists primarily of on-road facilities as well as some multi-use trails.

  Primary AT Roadway Routes are typically located on collector or arterial streets. These routes should feature a higher standard for cycling and pedestrian facilities than other routes, such as bike lanes, paved shoulders, and sidewalks on both sides of the street.

  Primary AT Trails are strategic multi-use off-road trail corridors that serve both a mobility function between major origins and destinations or as recreational destinations themselves. Ideally, primary AT trails should have a hard surface.



- **Secondary AT Routes** feed into the primary AT routes from residential areas or from specific destinations such as parks, schools, or other attractions.

  Secondary AT Roadway Routes are typically located on local streets that have lower traffic volumes and travel speeds than the primary routes. Special facilities for cyclists and pedestrians may not be required on these routes and route signage may suffice.

  Secondary AT Trails are shorter trails that serve a more localized user base than the primary AT trails. Secondary AT Trails are very important to the network, connecting neighbourhoods to the primary route system and to each other. Secondary AT Trails may also serve a specific recreational function. Typically, a crusher dust gravel surface is suitable for Secondary AT Trails, although a hard surface may be desirable on more prominent recreational routes.

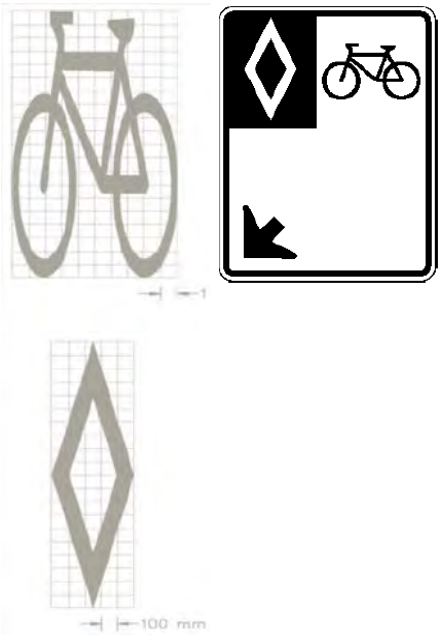
5.1.3 Maximizing Use of Existing Infrastructure

It is recognized that constructing new infrastructure or widening entire roadways can be prohibitively expensive and impractical, particularly for smaller communities. Therefore, an objective of this AT Plan was to maximize the use of existing infrastructure when identifying AT routes and facility recommendations.

Guidelines for facility types and designs have been provided for retro-fit situations, specific to street types in Rothesay. This allows AT facilities to be programmed within annual budgets and implemented on a reasonable timeline.

5.2 Roadway Cycling Facilities

5.2.1 Dedicated Bike Lanes



Bike lanes are defined as "a portion of the roadway which has been designated by striping, signing and pavement marking for the preferential or exclusive use by bicyclists". Bicycle lanes make the movements of both motorists and bicyclists more predictable and there are advantages to all road users in striping them on the roadway.

In general, bike lanes should always be on the right side of the roadway and designated for one-way travel, carrying bicyclists in the same direction as the adjacent traffic lane.

The width of a bike lane should be sufficient for a bicyclist to comfortably ride between the curb and gutter and the adjacent travel lane. Generally, recommended bike lane widths are 1.5 to 2.0 m, but may go as low as 1.2m in special circumstances such as a constrained roadway section; however, 1.2m wide bike lanes are not recommended on roadways with higher speeds (> 50 km/h), higher AADT's (>3,000 vehicles/lane), or higher truck volume percentages (> 12%). It is also not desirable to install a 1.2m bike lane, measured from the face of curb, when a concrete gutter is present. It is often more desirable to reduce the traffic lane width and allow for a bike lane width greater than 1.2m in a constrained environment.

For bicycle lanes adjacent to full time on-street parking, the parking width should be 2.4 m, the bike lane width should be 1.5m and an additional 0.5m buffer zone width should be provided in between. The additional width allows for opening of car doors without conflicting with cyclists.

5.2.2 Paved Shoulder

A paved shoulder can be a useful treatment for accommodating bicyclists and pedestrians on roadways with a rural cross-section (no curb). For cyclists, the practical effect of paved shoulders is little different than that of bike lanes, where cyclists travel in the same direction as vehicle traffic and follow the same signage and standards as vehicles.

Paved shoulders also provide benefits in terms of:

- Reduced maintenance costs associated with the grading of gravel shoulders;
- Serving as a refuge for disabled vehicles and accommodating emergency vehicles;
- Extending the life of a road by improving the lateral support for the roadway structure; and
- Reduced potential for run-off-the road collisions.

When implementing paved shoulders as an active transportation facility, both shoulders must be paved to facilitate cyclists riding with the flow of traffic in each direction. The widths of paved shoulders generally fall in the range of 1.0 to 2.0 m, but vary depending on traffic volume, truck volumes, speeds, grades, and road right-of-way. Excessively wide paved shoulders are not recommended, as they may appear to drivers as an additional lane. **Table 10** provides guidelines for desirable paved shoulder widths.

Table 10 – Paved Shoulder Width Guidelines[6]

Speed (km/h)	Paved Shoulder Width (m)	
	New Construction/ Reconstruction*	Repaving**
50	1.2	1.0
51 – 70	1.5	1.0
71 – 80	1.75	1.5
> 80	1.75	1.75

*New Construction/Reconstruction refers to situations where there is a sufficiently wide shoulder to accommodate the desired pavement width or where there is planned widening;

**Repaving refers to situations where the shoulder is insufficiently wide for the desired width and no widening is planned.

[6] Nova Scotia Transportation and Infrastructure Guidelines for Paved Shoulder Width for Active Transportation.

It is recommended that paved shoulders that are part of an active transportation network be signed with the Bicycle Route Marker Sign (refer to **Figure 9**), but not painted with bicycle specific symbols so that pedestrians feel welcome to use the shoulder as well.

5.2.3 Wide Shared Lanes

A wide shared lane or wide curb lane is a shared space intended for use by motor vehicles and cyclists. The portion of the road used by bicycles and the portion used by motor vehicles are not separated by longitudinal pavement markings. Motor vehicles and bicycles are expected to operate side by side. Wide shared lanes are typically applied on lower volume collector streets but may also be used on arterial roads where insufficient width is available for an exclusive bike lane and where traffic volume, speed, and vehicle mix do not exceed reasonable thresholds.

Wide shared lanes of 4.3m or greater allow a vehicle to pass a cyclist without encroaching the yellow centerline. Shared lanes with widths less than 4.3m normally require a vehicle to cross the centerline in order to pass a cyclist. Narrower widths may be acceptable where volumes of vehicles and cyclists are low and where speed limits are 50 km/h or less. **Figure 6** illustrates both a wide shared lane and a narrower shared lane.

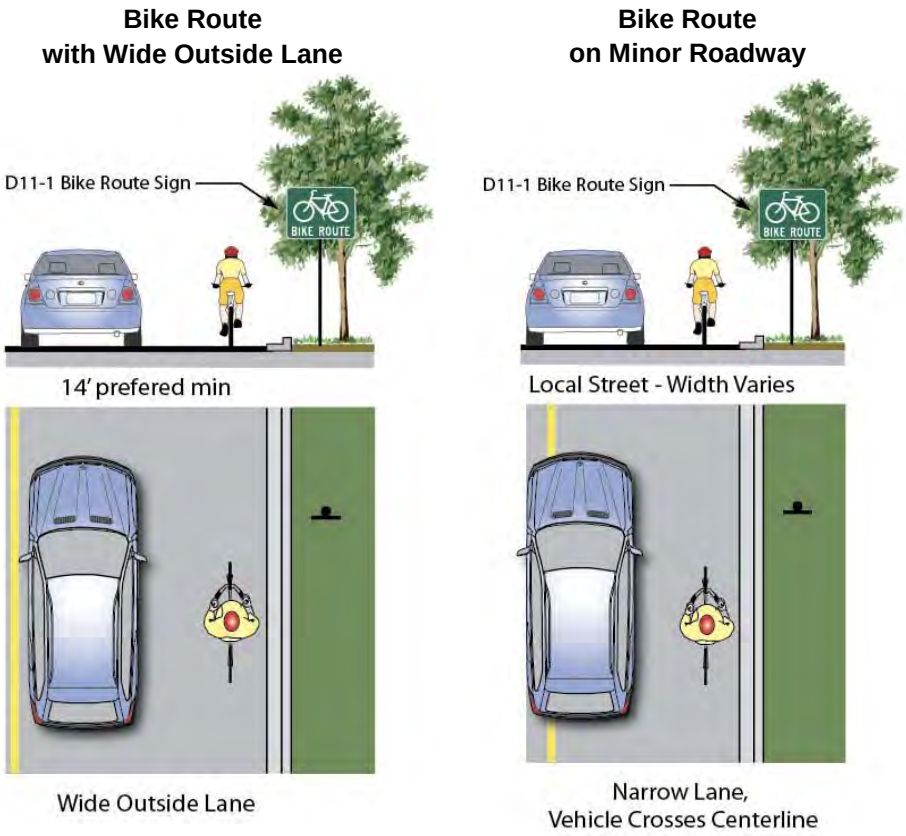
The TAC Geometric Design Guide suggests various widths for shared lanes based on AADT levels, as shown in **Table 11**.

Table 11 – Shared Lane Widths (TAC 1999)

AADT (Volume in the Shared Lane)	Lane Width (m)
0-1,000	Standard roadway lane width to 4.0
1,000-3,000	Standard roadway lane to 4.3
3,000-6,000	4.0 to 4.5
>6,000	4.3 to 4.8

Shared lanes often feature a bicycle symbol, referred to as a "sharrow", stamped at regular intervals. This marking is included in the newest version of the TAC *Bikeway Traffic Control Guidelines for Canada*. The primary purpose of the sharrow is to provide positional guidance to bicyclists on roadways that are too narrow to be striped with bicycle lanes and to alert motorists of the area a cyclist may occupy on the roadway. Shared lanes should also include "Share the Road" signage.

Figure 6 – Shared Lanes



Source: Alta Planning + Design, 2009

5.2.4 Signed-Only Route

Signed-Only routes are bicycle routes designated by bicycle signing along a street. A signed only route is a shared space for motor vehicles and cyclists and apart from the "bicycle route" signs, there are generally no changes made to the roadway. Signed-Only routes are typically installed on quieter residential local/collector streets. The signage is useful to cyclists for way-finding purposes and it identifies the street as a cycling facility.

5.2.5 Traffic Lane Widths

Selecting an appropriate traffic lane width is an important element in the process of designing for dedicated bike lanes, particular in retro-fit situations.

The TAC Geometric Design Guide provides recommended standard lane widths for urban applications, as listed in **Table 12**.

The guide also notes that in retrofit projects, where constraints are severe and the design speed is 60 km/h or less, a reduction of 0.2m in lane width from the standard values may be acceptable upon examination of local traffic and roadway conditions. These retrofit widths are also listed in **Table 12**. Note that, even in retrofit applications, lanes should not be narrower than 3.0 m.

Table 12 – Through Lane Widths for Urban Roadways (TAC 1999)

Through Lane Type	Standard Thru Lane Widths for Urban Roadways (m)	Lane Widths in Urban Retrofit Projects (m) (if acceptable upon review)
Major Arterial	3.7	3.5
Minor Arterial	3.5 – 3.7	3.3 – 3.5
Collector		
- Residential	3.5 – 3.7	3.3 – 3.5
- Commercial/Industrial	3.7	3.5
Local		
- Residential	3.0 – 3.7	3.0 – 3.5
- Commercial/Industrial	3.5 – 3.7	3.3 – 3.5

When deciding whether to reduce lane widths below a standard 3.5 to 3.7m width, conventional thought is that reducing widths below these levels may result in an increase in collision frequency; however a comprehensive study published in the *Transportation Research Record* in 2007 found that there is no indication that the use of 3.0m or 3.3m (10-11 ft) lanes rather than 3.6 (12 ft) lanes for urban roadway segments leads to increases in collision frequency. The report also notes that there are situations in which the use of narrower lanes may provide benefits in traffic operations and pedestrian safety, and may provide space for geometric features that enhance safety such as medians or turn lanes (or bike lanes). The analysis results indicate narrow lanes can generally be used to obtain these benefits without compromising safety.

5.2.6 Bike Lanes versus Wide Shared Lanes

There is some debate in the industry on whether dedicated bike lanes or wide shared lanes are the safer and preferred facility for cycling on roadways. A 2006 study commissioned by the Texas Department of Transportation sought to address this question by analysing cyclist and driver behavior on roads that had been retrofitted with both kinds of cycling facilities. Over 8,000 observations were made of vehicles passing cyclists of varying ages and abilities.

Two key findings of this study were:

- Cyclists on a road that provided an unmarked, wide shared lane tended to hug the curb dangerously close. Safer cyclist behavior occurred with a striped lane on the same overall pavement width;

- Motorists generally behaved similarly. Without a marked bike lane, they veered away from bicyclists, crossing into the next motorist lane nearly 90% of the time. With a striped bike lane, six of 10 motorists swerved, but those who swerved only encroached about 40 percent as far.

The overall conclusion of the study was that painted bike lanes on streets and roads helps both drivers and cyclists stay in safer, more central positions in their respective lanes.

Other past studies have found that when bike lanes are provided, bicyclists stop at intersections more often and obey general traffic rules better when roadways are marked to include them.

Bicyclists are also less likely to ride on sidewalks when on-street bike lanes exist. When cyclists ride on sidewalks, studies have shown that it increases their accident risk 25 times. This occurs primarily because motorists pulling onto roadways tend to focus on street traffic. As a result, a driver merging into roadway traffic may fail to see a sidewalk bicyclist and collide with them when the cyclist crosses the driveway.

"Without a marked bike lane, there appears to be a lot of uncertainty about how much space each person needs—even when adequate road space is provided"

"Bike lanes reinforce the concept that bicyclists are supposed to behave like other vehicles, and make life safer for everyone involved as a result"

--University of Texas Researchers

5.3 Multi-Use Trails

In addition to on-road facilities, multi-use trails can also be used for either commuter or recreational cycling. Multi-use trails may include an off-road trail through a park or public open space, along a utility corridor, rail corridor, or other easement, or in some cases within the road right-of-way beyond the curb/shoulder.

A minimum width of 3.0m should be considered for multi-use trails where there is a mix of pedestrians and cyclists and where bi-directional travel is expected. Multi-use pathways within urban areas typically have paved asphalt surfaces. Pathways in rural or environmentally sensitive areas often have granular surfaces consisting of compacted crusher dust.

A narrower surface width may be acceptable for short connections between streets and neighbourhoods (e.g. < 100 m); however, paved surfaces should still be considered to accommodate a

variety of users, including skateboarders, in-line skaters, and road bikes.

Even when on-road facilities exist on a nearby route, multi-use pathways can be beneficial, attracting a higher number of users and providing access to more natural environments such as parklands, undeveloped open space, and waterfronts. Multi-use trails are viewed by many communities as critical assets for the quality of life of residents and an attraction for tourists.

Rails with Trails

One potential application of multi-use trails that has been discussed for the Kennebecasis Valley, is to locate a trail parallel to the railway line, within the rail right-of-way. Such an arrangement is commonly referred to "rails with trails". These types of trails are quite common in the United States, and there are a number of examples in Canada, including Montreal, Laval, Waterloo, St. Thomas (ON), and Kelowna.


Duluth, Minnesota

During the *Quispamsis Active Transportation Plan*, discussions with CN officials indicated that a rails-with-trails arrangement in the Kennebecasis Valley would be acceptable to CN as long as the trail was set back a suitable distance from the rail and a fence was installed. However, research on this topic revealed that CN has stopped all work on a planned rails-with-trails corridor in Kelowna due to trespassing and liability concerns. This was after an initial response was favourable to the concept and a Phase 1 trail was completed. The decision from CN was brought down in 2009 and it appears that the issue has yet to be resolved.

For the Rothesay AT Plan, there are options to develop trails adjacent to the rail line, but it is recommended that the Town first pursue opportunities outside the rail right-of-way to maintain control of the project and avoid advancing a design that could be approved initially and quashed at a later date.


Kelowna, BC


Portland, Oregon

5.4 Pedestrian Facilities

5.4.1 Sidewalks

Sidewalks provide the backbone of a pedestrian network in an urban area. All streets with an urban (curbed) cross section should be provided with sidewalks. The typical exceptions to this are short cul-de-sacs less than 150m in length where traffic volumes are very low and pedestrians can safely share the pavement surface with vehicular traffic.

On collectors and arterials, it is desirable to have sidewalks on both sides of the street. Sidewalks on both sides of a street should especially be considered in areas where there is pedestrian access to schools, parks, shopping areas, recreational facilities, and transit stops.

Sidewalks should have a minimum width of 1.5 m. Wider sidewalks are often considered when placed directly adjacent to curbs, in areas with heavier pedestrian activity, or where there are an increased number of persons in wheelchairs such as near hospitals or nursing homes.

It is generally desirable to provide a 1 to 2m boulevard between the sidewalk and the curb, for the following reasons:

- A buffer area between vehicles and pedestrians increases safety for pedestrians and children at play;
- Pedestrians are less likely to be splashed by passing vehicles during wet weather conditions;
- Changes to the cross-slope of the sidewalk to provide for driveway gradients are minimized through the use of the boulevard; and
- Space is provided for street hardware, streetscaping elements, and snow storage.

5.4.2 Pedestrian Crossing Treatments

Pedestrian crossing facilities generally fall into the following four categories:

- Signed and Marked Crosswalk;
- Flashing (RA-5) Crosswalk;
- Half Signal (pedestrian activates red lights to stop traffic);
- Signalized Crossings at a Full Traffic Signal.

Descriptions of these facilities and the corresponding application warrants and principles are well documented in the Transportation Association of Canada *Pedestrian Crossing Control Manual* (1998). An update to this manual is expected to be released shortly that includes new technologies and application warrants.

In addition to the above facilities, there are other treatments that can increase pedestrian safety at various types of crossings. These are described below.

Highly Visible Crosswalk Markings

Many jurisdictions are now applying crosswalk markings that are more visible to drivers than the traditional parallel lines. When drivers can see the crosswalk, they seem more likely to respect the crosswalk as pedestrian space.

The more visible markings include “continental”, ”zebra”, or “ladder” style striping. The Transportation Association of Canada *Pedestrian Crossing Control Manual* (1998) suggests using zebra markings in special circumstances such as crossings involving school children, the elderly or handicapped, zones with high speed (70 km/h or greater), mid-block crossings, and traffic turning right at raised traffic islands.

Pedestrian Countdown Signals

Pedestrian countdown signals are placed at signalized intersections and give pedestrians an indication of how much time is left to cross the street by accompanying the “flashing don’t walk” signal with a numeric countdown.

Pedestrian countdown signals have been shown to reduce all crashes at signalized intersections by 25%. They also increase the incidence of pedestrians completing their crossing before the end of the “flashing don’t walk” phase.

Pedestrian Refuge Islands

Pedestrian / bicycle refuge islands are areas of the roadway where medians or curbs are constructed to protect pedestrians or bicyclists at crossings, allowing them to cross one direction of traffic at a time.

Refuge islands should be considered at multilane pedestrian crossings, particularly where a painted or barrier median already exists or is proposed. At trail crossings, bicyclists also benefit from being able to cross one direction of traffic at a time.

The placement of a refuge island on multilane roadways has been shown to reduce pedestrian crashes by 56%[7].

It is recommended that the Town of Rothesay consider implementation of a range of design features and elements to improve pedestrian safety and comfort, including zebra style crosswalks at candidate locations, pedestrian countdown signals at signalized intersections, and pedestrian refuge islands along Hampton Road or other high volume corridors that are difficult to cross.

The placement of a pedestrian refuge island on multilane roadways has been shown to reduce pedestrian crashes by 56%.

-- US Federal Highway Administration

5.5 Route Signage and Pavement Markings

TAC's *Bikeway Traffic Control Guidelines for Canada* provides complete signage and pavement marking guidelines for bicycle facilities. Guidelines for some of the most common signs for dedicated bike lanes, shared lanes, signed only bicycle routes, and multi-use paths are provided below in **Figure 7** through **Figure 10**.

Active Transportation networks should also include way-finding signs, route identification signs, information signs, and interpretative signs. These categories of signage are custom designed with a consistent style and branding. These are discussed more under *Amenities and Streetscaping* in **Chapter 8**.

[7] Federal Highway Administration. Desktop Reference for Crash Reduction Factors. 2007.

Figure 7 – Common Bicycle Lane Signage and Pavement Markings

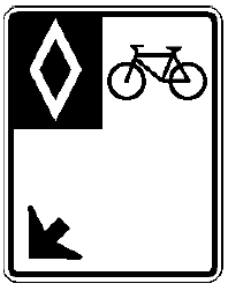
Bicycle Lane Signage

The *Reserved Bicycle Lane* signs indicate that a lane is reserved for exclusive use by bicycles. Reserved Bicycle Lane signs (RB-91) should be mounted directly adjacent to the reserved lane.

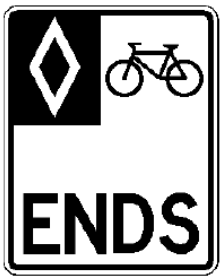
Reserved Bicycle Lane signs should be installed at a minimum of one sign between each intersection, with the first sign located downstream from each intersection, at a maximum of 15 m from the end of the curb radius, and subsequent signs installed at 200 m intervals. Additional signs may be installed between intersections where there is public access to the reserved bicycle lane. The *Reserved Bicycle Lane Ends* sign (RB-92) must be installed at the end of the reserved lane denoting the end of the bicycle lane. The dimensions of these signs are 600 mm x 750 mm.

The *Reserved Bicycle Lane Ahead* sign (WB-10) may be used to warn motorists that they are approaching a reserved bicycle lane. This sign should be considered where motorists are required to execute a manoeuvre to avoid the bicycle lane.

The *Turning Vehicles Yield to Bicycles* sign may be used in conflict zones where motorists are required to cross a cyclist facility and are required to yield to the cyclist.

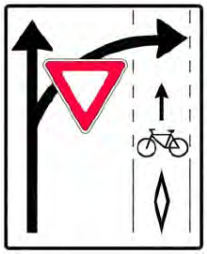


RB-91



RB-92

WB-10



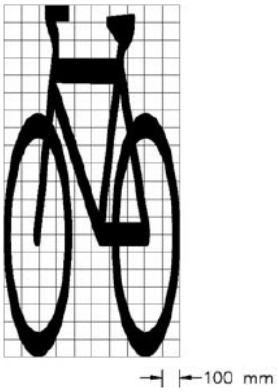
RB-37

Bicycle Lane Pavement Markings

All bicycle lanes are identified by a white elongated bicycle pavement marking. This symbol is 1.0 m wide, with an elongated length of 2.0m.

Dedicated bicycle lanes are also identified by a white elongated diamond symbol pavement marking. The stroke width of the diamond symbol is a minimum of 75 mm. The diamond symbol is used on the accompanying signing for reserved lanes (RB-90, RB-91, RB-92 and WB-10).

The diamond symbol is centred in the bicycle lane approximately 10m downstream from each intersection or from each crosswalk. Additional diamond symbols may be used, depending on the distance between the intersection or the presence of major access points.



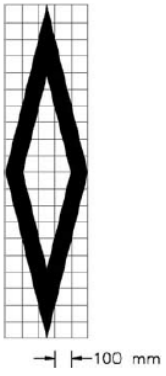


Figure 8 – Common Shared Lane Signage and Pavement Markings

Shared Lane Signage

The Share the Road sign (WC-19) is used to warn motorists that they are to provide adequate driving space for cyclists and other vehicles on the road. The sign also advises motorists and cyclists to use extra caution on the upcoming section of road.

The Share the Road supplementary tab sign (WC-19S) must be used to convey the meaning of the Share the Road sign. The dimensions of this tab sign are 600 mm x 300 mm.

This sign assembly is to be used where a road configuration changes, such as the discontinuation of a bicycle lane.

WC-19
WC-19S

Shared Use Lane Single File Signage

The Shared Use Lane Single File sign (WC-20) is used to warn motorists and cyclists that cyclists are allowed full use of the lane ahead and to warn motorists that the lane is too narrow for side-by-side operation. Shared use lane markings should be used to mark the location where cyclists should position themselves within the lane.

The Single File supplementary tab sign (WC-20S) must be used to convey the meaning of the Shared Use Lane Single File sign.

WC-20
WC-20S

Shared Lane Pavement Markings

Shared use lane markings, or “sharrows”, are symbols placed on the pavement surface in the intended area of bicycle travel. The symbols raise awareness to both cyclists and motorists of the correct cyclist positioning in the lane. Two white chevron markings, with a stroke width of 100 mm spaced at 100 mm are placed ahead of the bicycle symbol.

Sharrows should be placed immediately after an intersection and 10 m before the end of a block. Space longitudinally at intervals of 75 m (this spacing may be increased or decreased as needed to have evenly spaced markings within a block).

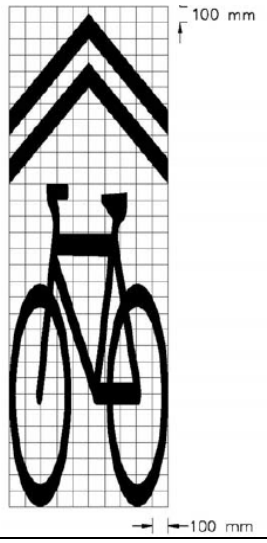


Figure 9 – Signed Only Bicycle Route Signage

Bicycle Route Marker Sign The Bicycle Route Marker sign provides route guidance for cyclists and indicates those streets, highways and separate facilities which form part of a bicycle route system. The sign should be placed at intervals frequent enough to keep cyclists aware of the changes in route direction, and to remind motorists of the presence of cyclists. This sign is unnecessary when the Reserved Bicycle Lane signs (RB-90, RB-91) are used.	 IB-23

Figure 10 – Common Multi-Use Path Signage

Shared Pathway Signs The *Shared Pathway* sign (RB-93) indicates that both cyclists and pedestrians are permitted to use the path. The *Pathway Organization* signs (RB-94R/RB-94L) indicate to cyclists and pedestrians how to share a path on which there is a designated area provided for each. These signs may be installed back-to-back. On multi-use paths, segregation of bicycles and pedestrians should be avoided, where possible. However, where it has been determined that this type of operation is suitable, these signs may be used.	 RB-93  RB-94  RB-95

6 Rothesay Design Guidelines

Design guidelines have been developed for the application of various types of active transportation facilities and elements in Rothesay. Specifically, these include:

1. **Dedicated Bike Lanes**
2. **Paved Shoulders**
3. **Shared Lanes/Wide Curb Lanes**
4. **Signed Only Routes**
5. **Multi-Use Trails** (hard-surfaced and gravel surface)

The design guidelines are presented below along with design roadway and trail cross-sections in **Figure 11** through **Figure 17**.

6.1 Dedicated Bike Lanes

Design Guidelines:

- *Dedicated bike lanes should generally be accepted as the preferred cycling facility on roadways with an urban cross-section.*
- *Where space allows, bike lanes should be implemented on primary connectivity routes.*
- *Bike lane widths should typically range from a minimum of 1.5m to a maximum of 2.0m, measured from the face of curb.*
- *A bike lane width of 1.2m may be acceptable in special circumstances such as a constrained roadway section, but should only be considered under the following conditions:*
    - *No concrete gutter present;*
    - *Lower speeds (<50 km/h);*
    - *Lower AADT's (<3,000 vehicles/lane); and/or*
    - *Lower truck volume percentages (< 12%).*
- *In the presence of on-street parking, the combined bicycle/parking lane should be a minimum of 4.4m wide. This width allows for a 1.5m bike lane, a 2.4m wide curbside-parking stall, and a 0.5m buffer in between. The extra distance provides space for the opening of car doors, and encourages cyclists to travel a safe distance from the parked vehicles.*
- *To facilitate the installation of bike lanes on existing street cross-sections, traffic lanes could be reduced according to TAC standards for minimum lane widths.*

Specific applications of the above guidelines to Rothesay Streets are discussed below for both two-lane and three-lane collector streets.

Two-Lane Collector Street

The Town of Rothesay's current Municipal Collector Street Standard provides a 9.75m curb-to-curb width and a 1.5m sidewalk on one side of the street. It is recommended that the Town update this standard to provide a desired width that accommodates bike lanes and sidewalks on both sides of the street.

The proposed desired standard is likely only applicable to new construction given the limited right-of-way available and other constraints for reconstructing local existing collector streets. In retro-fit situations, or in constrained environments, a modified standard is proposed. The details of the desired and modified collector street cross-sections are provided in **Table 13** and are depicted in **Figure 11** and **Figure 12**.

Table 13 – Proposed Cross-Sections for Two Lane Collectors

Street Element	Desired Standard	Retro-fit Modified Standard
Traffic lanes	3.5-3.7m	3.3-3.5m
Bike Lanes	1.5m	1.5m
Curb-to-Curb Width	10.0-10.4m	9.6-10.0m
Boulevard (min.)	1.0m	None
Sidewalk	1.5m Both Sides	1.8m One Side

Three-Lane Collector Street

A proposed desirable standard for a three-lane collector street allows for bike lanes, boulevards, and sidewalks on both sides. A bike lane width of 1.8m is desirable for roadway sections with higher traffic volumes and/or travel speeds.

A modified roadway standard is proposed for constrained right-of-way environments and features reduced traffic lane widths and no boulevards. The details of the desired and modified collector street cross-sections are provided in **Table 14** and are shown graphically in **Figure 13** and **Figure 14**.

Table 14 – Proposed Cross-Sections for Three Lane Collectors

Street Element	Desired Standard	Modified Standard
Thru Traffic Lanes	3.5m	3.3-3.5m
Turning Lane	3.0m	3.0m
Bike Lanes	1.5-1.8m	1.5m
Curb-to-Curb Width	13.0-13.6m	12.6-13.0m
Boulevard (min.)	1.0 m	None
Sidewalk	1.5m Both Sides	1.8m Both Sides

The Town does not have a formal standard for a Three-Lane Collector Street, but Hampton Road features three lanes, with 4.0m wide curb lanes and a 3.0m centre turning lane. This width is not sufficient for accommodating bike lanes even under a modified retro-fit standard. Therefore, widening would be required on Hampton Road to accommodate either the desired or modified standard. In either case, the 3.0m centre turning lane could be converted, at acceptable locations, to a landscaped median or pedestrian refuge island for enhanced aesthetics and safety.

6.2 Paved Shoulder

Design Guidelines

- *Paved shoulders should be implemented on all primary rural road connectivity routes within the active transportation network. In general, paved shoulders should be considered a desirable asset to the standard road cross-section.*
- *Paved shoulders should be a minimum of 1.0m wide and a maximum of 1.75m wide, based on guidelines in **Table 5**.*
- *Paved shoulders that are part of an active transportation network should be signed with the Bicycle Route Marker Sign, but not painted with bicycle specific symbols so that pedestrians feel welcome to use the shoulder as well.*
- *Candidate roadways in Rothesay include Campbell Drive and Millennium Drive.*

Paved shoulders as part of a desired rural cross-section are depicted in **Figure 15**.

6.3 Shared Lanes/Wide Curb Lanes

Design Guidelines:

- *Shared lanes may be implemented on primary or secondary connectivity routes, dependant on site conditions.*

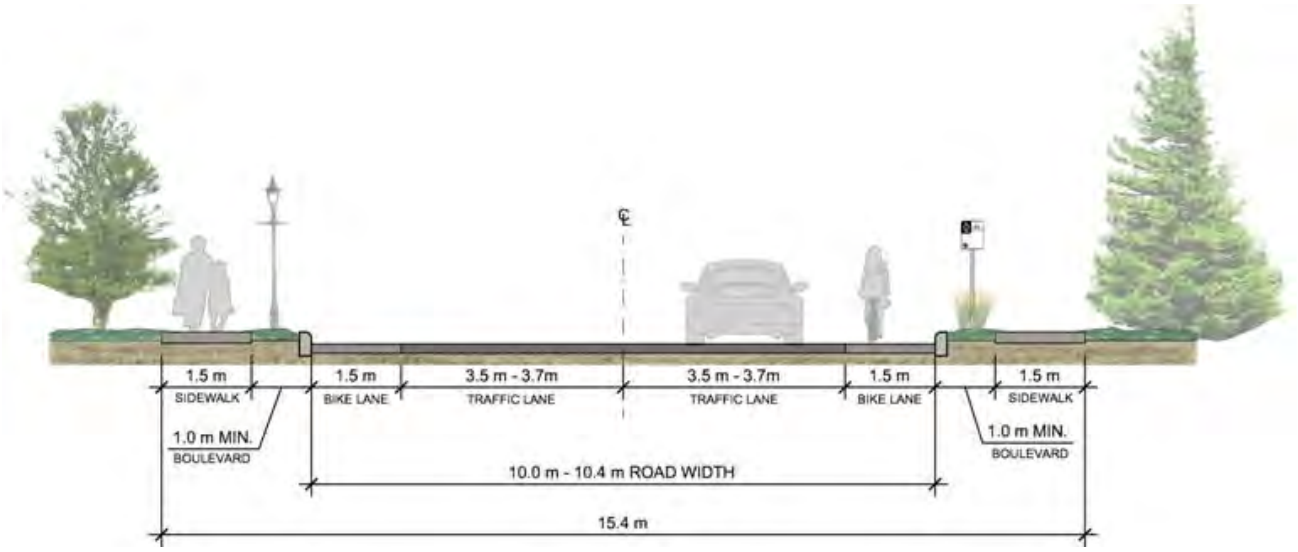
- *Shared lanes should typically be applied on lower volume collector streets but may also be used in other situations where insufficient width is available for an exclusive bike lane and where traffic volume, speed, and vehicle mix do not exceed reasonable thresholds.*
- *The minimum desirable width for shared lanes is 4.3 m, which allows a vehicle to pass a cyclist without encroaching the yellow centerline.*
- *Lane widths narrower than 4.3m may be acceptable where volumes of vehicles and cyclists are low and where speed limits are 50 km/h or less.*
- *Shared Lanes should include the stamped sharrow symbol and "Share the Road" signage, spaced at no more than 200m intervals.*

6.4 Signed-Only Route

Design Guidelines:

- *Signed only routes should be installed on secondary connectivity routes or other low-volume residential local/collector streets as deemed appropriate.*
- *Signed-only routes should be installed on quiet residential local/collectors streets, preferably with AADT volumes less than 1,000 vehicles per day.*
- *Signed-only routes should be signed with "Bicycle Route" signage. No pavement markings are required.*

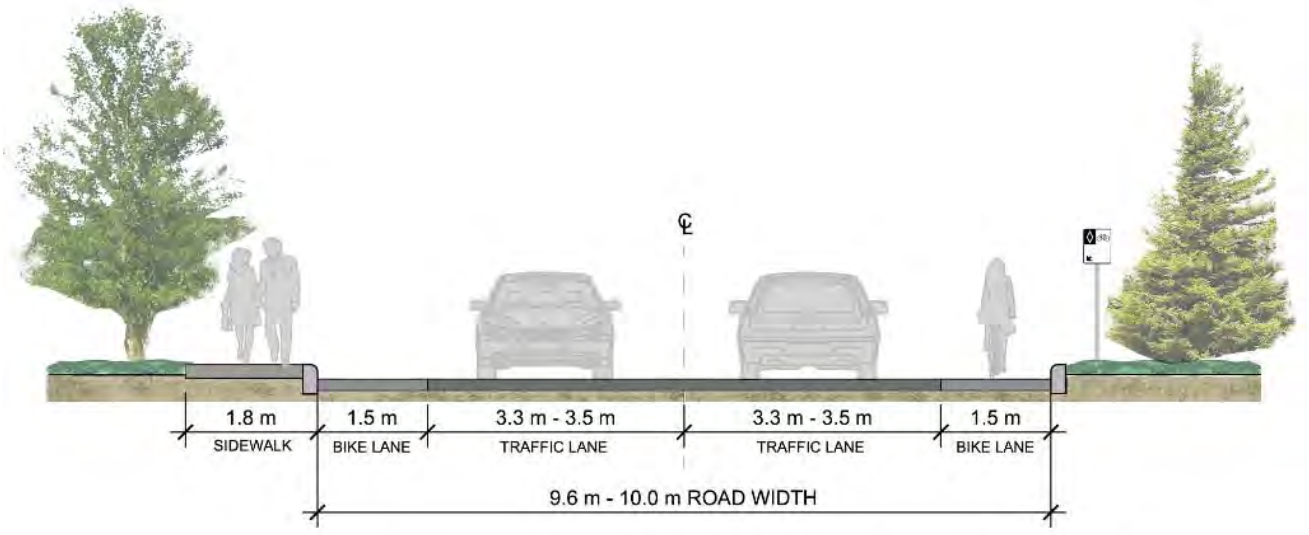
Figure 11 – Desired Standard: Two-Lane Collector Street with Bike Lanes



Candidate Routes:
New or Reconstructed Collector Streets

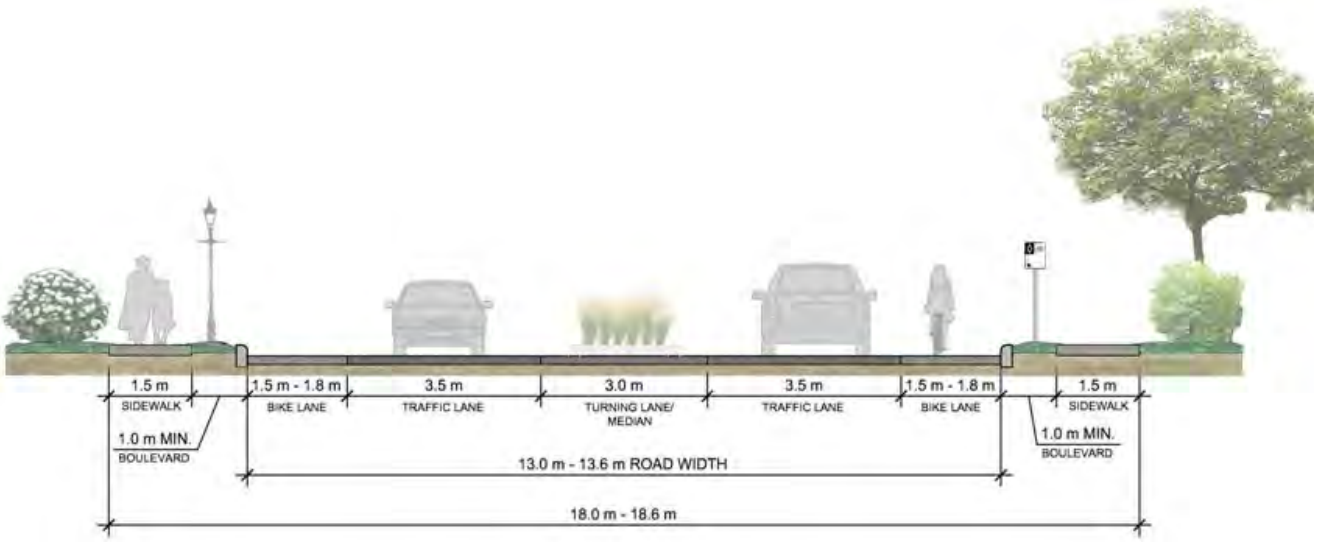
Application to existing collector streets requires road widening

Figure 12 – Modified (Retrofit) Standard: Two-Lane Collector Street with Bike Lanes



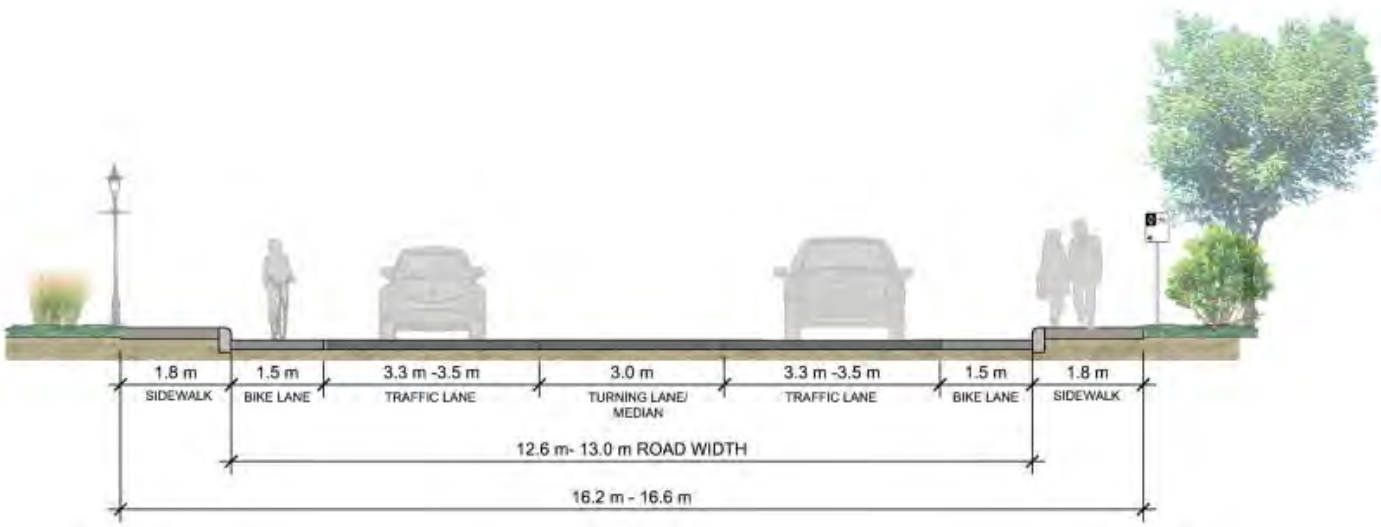
Candidate Routes:
Rothesay Road
Marr Road
Clark Road
Grove Avenue
Fox Farm Road
French Village Road
Sections of Gondola Point Road

Figure 13 – Desired Standard: 3-Lane Collector Street with Bike Lanes



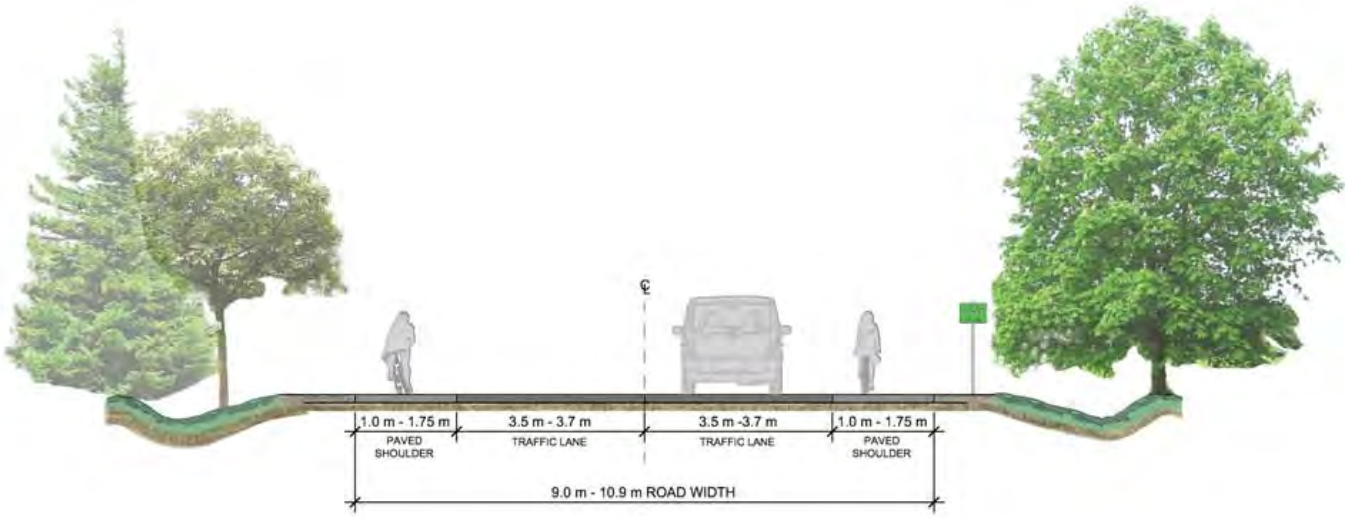
Candidate Routes:
Hampton Road, widening required

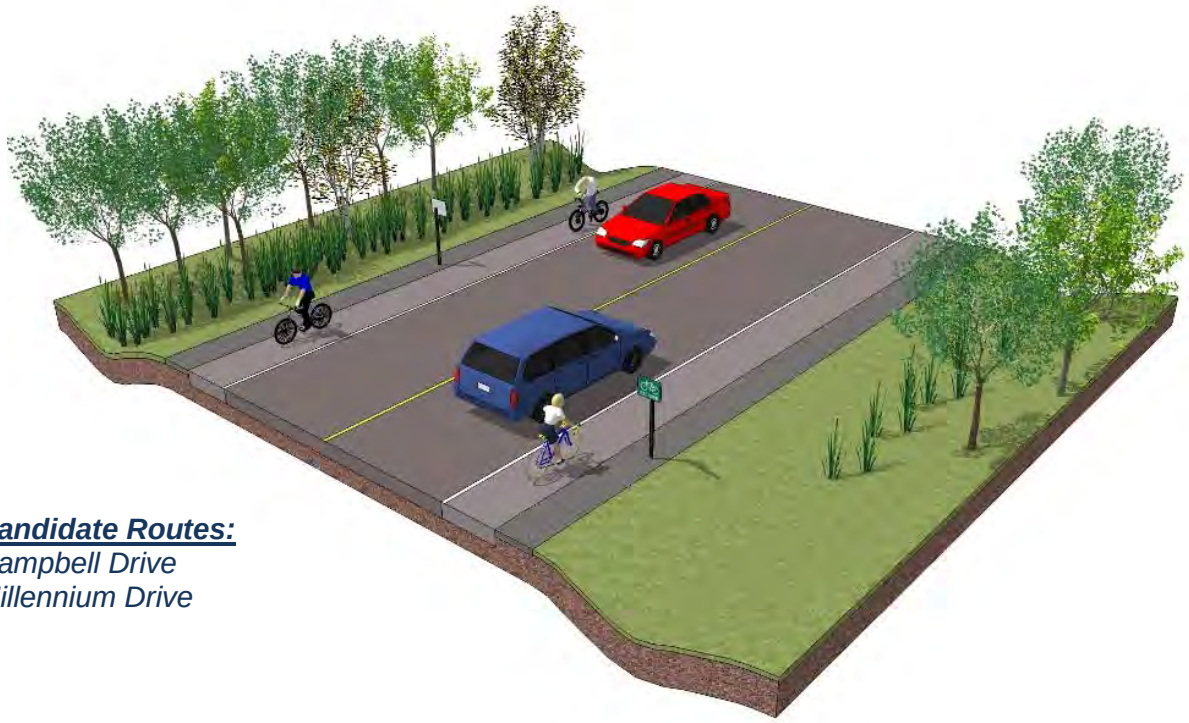
Figure 14 – Modified (Retrofit) Standard: 3-Lane Collector Street with Bike Lanes



Candidate Routes:
Hampton Road, widening required

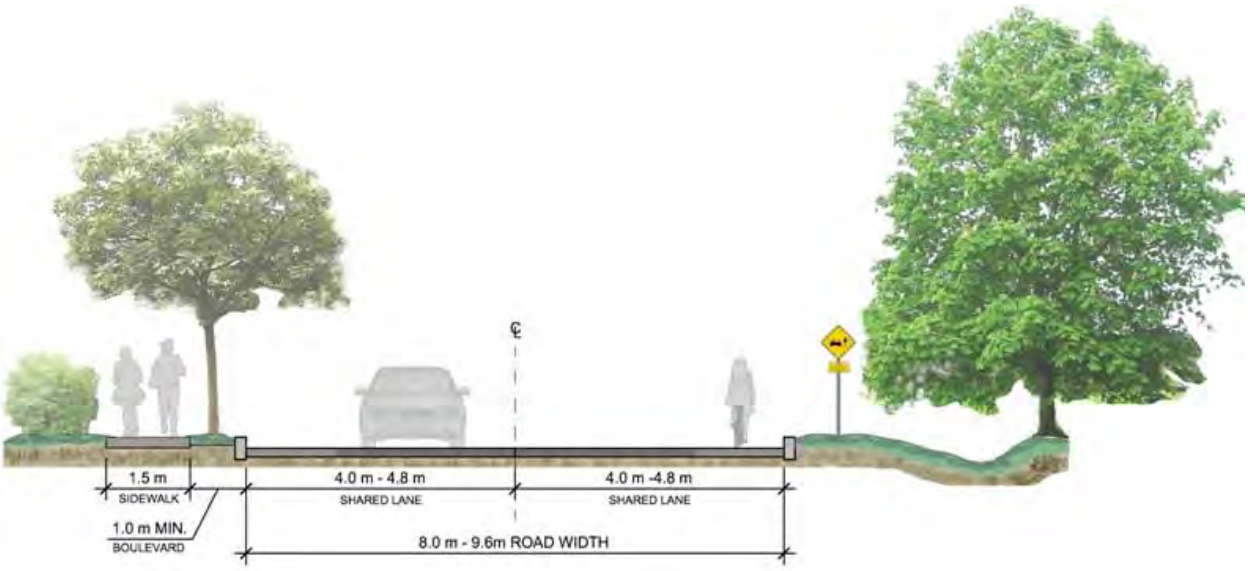
Figure 15 – Desired Standard for Paved Shoulders on Rural Roads





Candidate Routes:
Campbell Drive
Millennium Drive

Figure 16 – Desired Standard for Shared Lanes/Wide Curb Lanes



Candidate Routes:
Gondola Point Road
Highland Avenue

6.5 Multi-Use Trail Facilities

Design Guidelines:

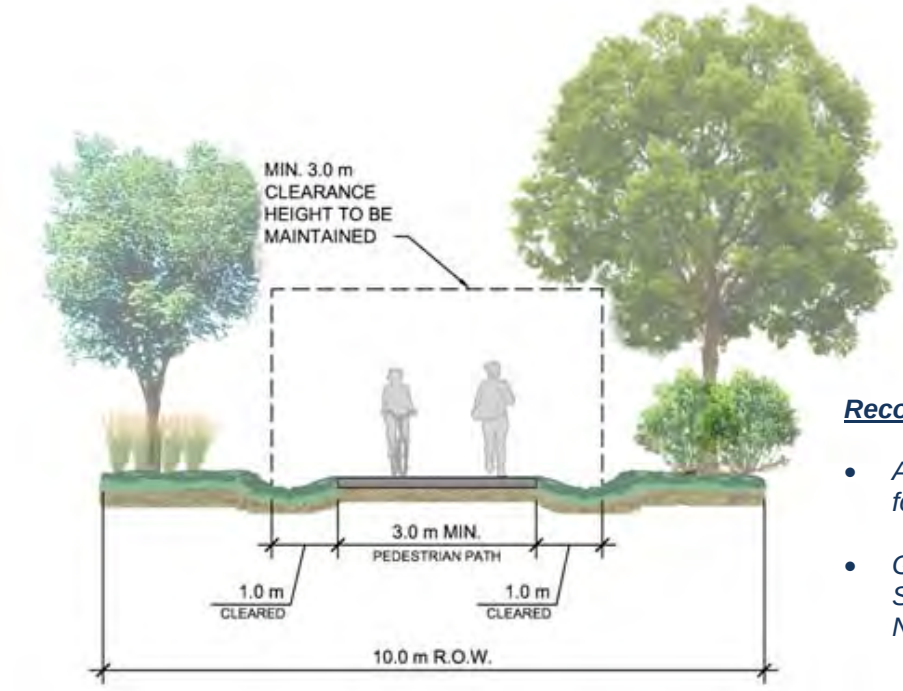
- *Multi-Use trails should have a minimum width of 3.0m and a minimum 1.0m of cleared area on each shoulder;*
- *Primary trails, particularly those closer to the urban area should be hard surfaced using either asphalt or reclaimed asphalt pavement. Secondary trails, or those in environmentally sensitive areas, should have a crusher dust surface.*
- *A cleared vertical height over the trail of at least 3.0 m is desirable;*
- *The following guidelines should be referenced when designing trail geometry:*
    - *Transportation Association of Canada Geometric Design Guide for Canadian Roads (1999); and*
    - *Guideline for the Development of Bicycle Facilities, Fourth Edition, American Association of State Highway and Transportation Officials, 2012.*

Surfacing – RAP vs. Asphalt

Note that the use of reclaimed asphalt pavement (RAP) as a substitute for asphalt would result in significant cost savings for trail construction. It is estimated that RAP surfacing is approximately 60% of the cost of asphalt surfacing. The City of Rochester Hills, Michigan, has used RAP extensively for trail surfacing. Their staff were contacted and indicated that their department and their users have been very pleased with the performance. Some limitations of RAP are that line painting does not work well, and RAP surfaces should not be plowed. NB Trails has also used RAP on some trail sections and indicated that they are very pleased with its performance.

Further investigation may be required but it is recommended that the Town strongly consider the use of RAP as a hard surface for its Primary Trails.

Figure 17 – Desired Standard for Multi-Use Pathways



Recommended Surface:

- *Asphalt or Reclaimed Asphalt for Primary Pathways*
- *Gravel Crusher Dust for Secondary Pathways and Neighbourhood Connections*

7 Active Transportation Network

7.1 Network Overview

The proposed active transportation network comprises the following classifications of active transportation corridors:

- Primary AT Roadway Corridor;
- Secondary AT Roadway Corridor;
- Primary AT Pathway; and
- Secondary AT Pathway/Neighbourhood Connection.

The AT network map is shown in **Figure C.1** in **Appendix C**. A description of each corridor as well as the specific AT facilities recommended are described in the following sections. More detailed mapping highlighting recommendations for each corridor is also provided in **Appendix C**.

7.2 Primary AT Roadway Corridors

7.2.1 Rothesay Road

Rothesay Road is classified as a Provincial Collector Highway (Route 100) and is a primary travel route through Rothesay, providing access to a high number of residential local streets. It also serves a considerable volume of through traffic with AADT volumes ranging from 10,400 to 13,900 vehicles per day. Rothesay Road is also a popular route for cyclists, walkers, and runners, serving both recreational users and commuters.

The AT facilities recommended for Rothesay Road are described below for several roadway sections, with each have individual characteristics to be considered. The road sections include:

- Saint John Boundary to East Riverside-Kingshurst Park;
- East Riverside-Kingshurst Park to College Hill Road; and
- College Hill Road to Hampton Road.

Rothesay Road
0.000 to 2.900 km: Saint John Boundary to East Riverside-Kingshurst Park

Rothesay Road from the Saint John City Boundary to East Riverside Kingshurst Park is consistent with the Municipal Collector Street standard. Curb-to-curb pavement widths are in

the 9.6-9.8m range and sidewalk is provided on the south side only, immediately adjacent to the curb.

Curb-to-Curb Width:	9.6-9.8 m
Sidewalk:	1.5m adjacent to curb, south side only
Speed Limit:	60 km/h
AADT:	10,400 to 13,000
Truck Volume %:	1.6%

Bike lanes are the recommended cycling facility for Rothesay Road due to the volume of traffic and potential usage by cyclists. The existing width along this section of Rothesay Road is too narrow to accommodate the preferred widths of 1.5m bike lanes and 3.5m traffic lanes, and widening is likely not feasible due to property and utility constraints. However, a modified cross-section using 3.3-3.4m traffic lanes and 1.5m bike lanes is considered acceptable due to the low volume of truck traffic and relatively low speed limit (≤ 60 km/h). The 3.3m travel lane is not anticipated to have an adverse impact on safety or capacity. It is, however, expected to result in reduced travel speeds due to the perception of a narrower roadway.

Ideally, all collector roadways should be designed with sidewalks on both sides of the street. Although there are few accesses to residences along the north side of the street, this provides the advantage of minimizing curb cuts and driveway ramps, which is an attractive feature to walkers and runners and for the elderly or those with disabilities.

The feasibility of a north sidewalk may be limited in some areas due to the close proximity of the rail right-of-way and utility poles; however, one location with a good opportunity for a north sidewalk is the existing gravel path from Dunedin Road to East Riverside-Kingshurst Park. This sidewalk would provide the following benefits:

- Complete a continuous sidewalk on the north side of Rothesay Road from Dunedin Road to Hampton Road;
- Provide a formal pedestrian link to the Comex bus stop opposite Riverside Golf Course; and
- Allow for a potential pedestrian crossing at Dunedin Road, which is identified as a Secondary AT Roadway Corridor.

The construction of the sidewalk could be concrete or asphalt surfaced, and set back from the curb by a boulevard. In front of the East Riverside-Kingshurst Park parking lot, a concrete sidewalk could be continued behind the landscaped boulevard

area. This would displace the parallel parking strip but an alternative parking arrangement may be possible to maintain the same number of spaces (e.g. using angled parking along the north edge of the lot). The total length of the sidewalk would be approximately 420 m.

Recommendations:

1. ***Paint 1.5m bike lanes on Rothesay Road, measured from the face of curb, and install appropriate bike lane markings and signage.***
2. ***Convert the gravel path between Dunedin Road and East Riverside-Kingshurst Park to a concrete or asphalt sidewalk/pathway (360 m) and continue a concrete sidewalk along the front of the Park parking lot (60 m.***
3. ***Consider future installation of sidewalk on the north side of Rothesay Road, from the Town Limits to Dunedin Road (2.5 km). The feasibility of this may be limited in some areas due to the close proximity of the rail right-of-way and utility poles.***
4. ***Consider widening Rothesay Road to a desired 10m width, if the opportunity arises during future reconstruction efforts. The feasibility of this may be limited in some areas due to the close proximity of the rail right-of-way and utility poles.***

Rothesay Road

2.900 to 4.200 km: East Rivserside-Kingshurst Park to College Hill Road

Rothesay Road from East Riverside-Kingshurst Park to College Hill Road is consistent with the Municipal Collector Street standard. Curb-to-curb pavement widths are in the range of 9.6-9.8m and sidewalk is provided on the north side only, with the exception of the first 100m between East Riverside Kingshurst Park and Gibbon Road where sidewalk is provided on both sides.

Curb-to-Curb Width:	9.6-9.8 m
Sidewalk:	1.5m adjacent to curb, north side only
Speed Limit:	50 km/h
AADT:	13,000
Truck Volume %:	1.6%

Bike lanes are the recommended cycling facility for this section of Rothesay Road due to the volume of traffic and potential usage by

cyclists. A cross-section consisting of 3.3-3.4m traffic lanes and 1.5m bike lanes is proposed and considered acceptable due to the low volume of truck traffic and low speed limit (50 km/h).

Ideally, all collector roadways should be designed with sidewalks on both sides of the street. Consideration should be given to installing a 1.5m wide sidewalk on the south side of Rothesay Road, particularly given the high number of residences and residential local streets on the south side. The feasibility of this may be limited in some areas due to property constraints and proximity of mature trees.

The sidewalk on the north side should also be upgraded to a 1.8m sidewalk, during the next sidewalk reconstruction effort.

Recommendations:

1. ***Paint 1.5m bike lanes on Rothesay Road, measured from the face of curb, and install appropriate bike lane markings and signage.***
2. ***Consider installation of sidewalk on the south side of Rothesay Road, from Gibbon Road to College Hill Road.***
3. ***Consider widening Rothesay Road to a desired 10m width, if the opportunity arises during future reconstruction efforts and if feasible based on property and utility constraints.***

Rothesay Road

4.200 to 4.800 km: College Hill Road to Hampton Road

Rothesay Road from College Hill Road to Hampton Road is narrower than a Municipal Collector Street standard. Curb-to-curb pavement widths are in the range of 8.6 to 9.0 m. Sidewalk is provided on the north side only. The narrowest section of 8.6m is on the Taylor Brook bridge crossing just east of College Hill Road. Pedestrians are accommodated via a separate pedestrian walkway on the north side of the bridge. The speed limit is reduced to 40 km/h throughout this section.

Curb-to-Curb Width:	8.6-9.0 m
Sidewalk:	1.5m adjacent to curb, north side only
Speed Limit:	40 km/h
AADT:	13,000 – 13,900
Truck Volume %:	1.7%

It is desirable to continue bike lanes through to Hampton Road, but the 9.0m pavement width on this section of Rothesay Road makes this a challenge. Two options were considered:

1. Use narrower bike lanes and/or traffic lanes to fit within the 9.0m pavement width. For example, 1.2m bike lanes with 3.3m traffic lanes, 1.5m bike lanes with 3.0m traffic lanes, or a combination in between.

2. Provide shared lane markings and signs from College Hill Road to Hampton Road.

Given that this section of Rothesay Road features a 40 km/h speed limit, has a straight alignment and is relatively short, the use of bike lanes with narrower traffic lanes is considered appropriate. It would be desirable to use bike lanes wider than the minimum 1.2 m, given that there is a gutter pan on the south side of Rothesay Road. A configuration with a 1.2m bike lane on the north side (without gutter) a 1.4 m bike lane on the south side (with gutter) and 3.2m traffic lanes would be a reasonable solution.

For the Taylor Brook bridge, it is not recommended to use a reduced bike lane and travel lane width, given that cyclists may shy away from the bridge rail and encroach into the travel lane. Instead, it is recommended that the bike lanes terminate before the bridge and a shared lane be implemented with a *Shared Use Lane Single File Sign* to warn motorists and cyclists that cyclists are allowed full use of the lane ahead and to warn motorists that the lane is too narrow for side-by-side operation. Sharrows should also be used to mark the location where cyclists should position themselves within the lane.

Recommendations:

1. ***Terminate bike lanes before the bridge approaches and implement shared lanes with a Shared Use Lane Single File sign and sharrow pavement markings.***
2. ***From the bridge to Hampton Road, paint a 1.4m bike lane on the south side of Rothesay Road and a 1.2m bike lane on the north side of Rothesay Road, measured from the face of curb, and install appropriate bike lane markings and signage.***
3. ***Consider installation of sidewalk on the south side of Rothesay Road. At a minimum sidewalk should be installed on the 200 m section from Maiden Lane to Hampton Road, given the adjacent land use of***

residences and restaurant and the proximity to the middle school and Common.

4. ***Consider widening Rothesay Road to a desired 10m width, if the opportunity arises during future reconstruction efforts and if feasible based on property and utility constraints.***

7.2.2 Gondola Point Road

Gondola Point Road is classified as a Municipal Collector Street and is primarily a residential corridor. AADT volumes range from 3,400 to 14,100 vehicles per day, with the largest volumes between Clark Road and Vincent Road. Gondola Point Road is also a popular route for cyclists, walkers, and runners, serving both recreational users and commuters.

The AT facilities recommended for Gondola Point Road are described below for three roadway sections, each having individual characteristics to be considered:

- Hampton Road to Almon Lane;
- Almon Lane to Clark Road; and
- Clark Road to Quispamsis Boundary.

Gondola Point Road
0.000 to 0.500 km: Hampton Road to Almon Lane

Gondola Point Road from Hampton Road to Almon Lane is consistent with a Municipal Collector Street standard. Curb-to-curb pavement widths are in the range of 9.7m and sidewalk is provided on the north side only.

Curb-to-Curb Width:	9.7 m
Sidewalk:	1.5m adjacent to curb, north side only
Speed Limit:	50 km/h
AADT:	5,600
Truck Volume %:	1.6%

Bike lanes are recommended as a cycling facility for this section of Gondola Point Road. A cross-section consisting of 3.3-3.4m traffic lanes and 1.5m bike lanes is proposed and considered acceptable due to the lower volume of traffic, very low truck traffic, and low speed limit (50 km/h).

It would be desirable to have sidewalks on both sides of this section of Gondola Point Road, given that the south side of the

street borders Rothesay Common and Rothesay Park School. As well, a continuation of a south sidewalk from Church Avenue to Almon Lane would connect into the existing south sidewalk on Gondola Point Road, east of Almon Lane.

Recommendations:

1. ***Implement 1.5m bike lanes on this section of Gondola Point Road, measured from the face of curb, and install appropriate bike lane markings and signage.***
2. ***Install sidewalk on the south side of Gondola Point Road, from Hampton Road to Almon Lane.***
3. ***Consider widening Gondola Point Road to a desired 10m width, if the opportunity arises during future reconstruction efforts and if feasible based on property and utility constraints.***

Gondola Point Road

0.500 to 1.600 km: Almon Lane to Clark Road

Gondola Point Road from Almon Lane to Sprucewood Avenue is narrower than a Municipal Collector Street standard, with curb-to-curb pavement widths in the range of 9.0 m. From Sprucewood Avenue to Clark Road (250 m), the roadway widens to a range of 9.7 to 10.0 m, which is more consistent with a Municipal Collector Street standard. Throughout the entire section, sidewalk is provided on the south side only. Traffic volumes are considerably lower throughout this section and pedestrian volumes were observed to be lower as well.

Curb-to-Curb Width:	9.0m (Almon to Sprucewood, 850 m) 9.7m (Sprucewood to Clark, 250 m)
Sidewalk:	1.5m adjacent to curb, south side only
Speed Limit:	50 km/h
AADT:	5,600 to 6,700
Truck Volume %:	1.7%

The limited roadway width of 9.0 m would require narrower bike lanes than desired or 3.0 m traffic lanes. The narrowed configuration is not recommended for this section of Gondola Point Road due to a number of steep grades and roadway curvature. Instead, the existing shared lanes are the recommended cycling facility for this 1.1 km section of Gondola Point Road, as it stands today. The 4.5 m wide lane in each direction is suitable for shared lanes and traffic volumes are relatively low.

It would be desirable to have sidewalks on both sides of Gondola Point Road, given that it is a collector street and provides access to a number of residences on the north side; however, this sidewalk installation is considered a lower priority than other sidewalks given the lower number of residences served.

Recommendations:

1. ***Maintain shared lanes on this section of Gondola Point Road. The existing shared lane markings and signage should remain in place.***
2. ***Consider a future installation of sidewalk on the north side of Gondola Point Road, from to Almon Lane to Clark Road.***
3. ***Consider widening Gondola Point Road to a desired 10m width, if the opportunity arises during future reconstruction efforts and if feasible based on property and utility constraints.***

Gondola Point Road

1.600 to 3.700 km: Clark Road to Quispamsis Boundary

Gondola Point Road from Clark Road to the Quispamsis Boundary is consistent with a Municipal Collector Street standard. Curb-to-curb pavement widths are in the range of 9.7 m. Sidewalk is provided on one side throughout and on both sides in some sections.

Curb-to-Curb Width:	9.7 m
Sidewalk:	1.5m adjacent to curb, one or both sides
Speed Limit:	50 km/h
AADT:	3,400 to 14,100
Truck Volume %:	2.0%

Bike lanes are recommended as a cycling facility for this section of Gondola Point Road. A cross-section consisting of 3.3-3.4m traffic lanes and 1.5m bike lanes is proposed and considered acceptable due to the low truck traffic, and low speed limit (50 km/h).

Two constrained areas for implementing bike lanes are at the CN Rail overpass and at the Gondola Point Road/Isaac Street intersection.

Beneath the rail overpass, the roadway in each direction is too narrow to accommodate bike lanes. Widening this road section is recommended. The north and south bridge piers are set back

2.6m and 3.3m, respectively, from the existing face of curb, which provides sufficient space for widening without impacting the piers. A concept for this widening and the recommended is bike lanes is provided in **Figure D.1** in **Appendix D**.

The Gondola Point Road/Isaac Street intersection features three lanes on Gondola Point Road, but only a roadway width of 10.3m. This width is not adequate to accommodate bike lanes while maintaining the three vehicle lanes. Therefore it is recommended that the bike lanes end upstream of the intersection and shared lanes implemented through the intersection area. This would be consistent with the existing shared lane treatment at this location.

Table 15 provides a summary of existing sidewalk locations on this section of Gondola Point Road. It would be desirable to have sidewalks on both sides of Gondola Point Road from River Road to Vincent Road, given the high number of residences in the area and the nearby elementary school.

Table 15 – Sidewalk Locations on Gondola Point Road

Roadway Section	South Side	Both Sides
Clark Road to River Road	150 m	
River Road to Ball Park Avenue		70 m
Ball Park Avenue to Kirkpatrick Road	230 m	
Kirkpatrick Road to Cameron Road		160 m
Cameron Road to Isaac Street	460 m	
Isaac Road to Frances Avenue		280 m
Frances Avenue to Town Limits	750 m	
Total	**1,590 m**	**510 m**

Recommendations:

1. ***Implement 1.5m bike lanes on this section of Gondola Point Road, measured from the face of curb, and install appropriate bike lane markings and signage.***
2. ***Widen the lanes on Gondola Point Road beneath the CN Rail Overpass to provide adequate width for bike lanes (curb to curb width of 5.4m in each direction).***
3. ***Terminate the bike lanes upstream of the Gondola Point Road/Isaac Street intersection in each direction and introduce shared lanes through the intersection area.***
4. ***Install sidewalk on the north side of Gondola Point Road, from River Road to Vincent Road.***

5. ***Consider widening Gondola Point Road to a desired 10m width, if the opportunity arises during future reconstruction efforts and if feasible based on property and utility constraints.***

7.2.3 Vincent Road

0.000 to 0.250 – Gondola Point Road to Town Limits

Vincent Road is classified as a Municipal Collector Street and provides access to a large residential area as well as Rothesay Baptist Church. Vincent Road feeds a large volume of commuter traffic to Gondola Point Road, which continues to points beyond.

Vincent Road is consistent with a Municipal Collector Street standard, with a curb-to-curb pavement width in the range of 9.6-9.8 m. Sidewalk is provided on the south side only.

Curb-to-Curb Width:	9.7 m
Sidewalk:	1.5m adjacent to curb, south side only
Speed Limit:	50 km/h
AADT:	7,000
Truck Volume %:	2.6%

Bike lanes are recommended as a cycling facility for Vincent Road. A cross-section consisting of 3.3-3.4m traffic lanes and 1.5m bike lanes is proposed and considered acceptable based on the volumes and travel speed; however, the Town of Quispamsis has identified Vincent Road as an AT Collector Street and has implemented a shared lane treatment. Given the short length of Vincent Road within Rothesay, it may best initially to implement shared lanes rather than bike lanes to be consistent with the Quispamsis treatment.

It would also be desirable to have sidewalks on both sides of Vincent Road given that it is a collector street and serves a large residential area.

Recommendations:

1. ***Implement shared lanes on Vincent Road, with Sharrows and appropriate Shared Lane signage.***
2. ***Consider installation of sidewalk on the north side of Vincent Road.***
3. ***Consider widening Vincent Road to a desired 10m width, if the opportunity arises during future reconstruction efforts and if feasible based on property and utility constraints.***

7.2.4 Hampton Road

Hampton Road is classified as a Provincial Collector Highway (Route 100) and is a primary travel route through Rothesay and Quispamsis, providing access to a variety of land uses and destinations including Rothesay Common, three schools, Rothesay Arena, and the commercial Town Centre. AADT volumes range from 9,000 to 19,300 vehicles per day, with the heaviest volumes being from Marr Road to the Quispamsis Boundary. Hampton Road is a popular route for cyclists and pedestrians, serving both recreational users and commuters.

The AT facilities recommended for Hampton Road are described below for several roadway sections, each having individual characteristics to be considered. The road sections include:

- Rothesay Road to Highland Avenue; and
- Highland Avenue to Quispamsis Boundary.

Hampton Road

0.000 to 0.990 km: Rothesay Road to Highland Avenue

Hampton Road is consistent with the Municipal Collector Street standard from Rothesay Road to Summer Rose Lane (580m). Curb-to-curb pavement widths are in the range of 9.6-9.8m and sidewalk is provided on the north side only. From Summer Rose Lane to Highland Avenue (410m), the curb-to-curb width increases to 11.0m. Sidewalk is provided on both sides of the street from Arthur Miller Fields to Highland Avenue and a grassed boulevard separates the sidewalk from the curb.

Curb-to-Curb Width:	9.6-9.8m for 580 m / 11.0m for 410 m
Sidewalk:	1.5m north side / both sides
Speed Limit:	50 km/h
AADT:	9,000 to 10,000
Truck Volume %:	1.8%

Bike lanes are the recommended cycling facility for this section of Hampton Road due to the volume of traffic and potential usage by cyclists. A cross-section consisting of 3.3-3.4m traffic lanes and 1.5m bike lanes is proposed from Rothesay Road to Summer Rose Lane. Slightly wider vehicle and bike lanes could be implemented from Summer Rose Lane to Highland Avenue.

It would be desirable to have sidewalks on both sides of Hampton Road from Rothesay Road to Arthur Miller Fields, given that this section of Hampton Road is a route to school and the Common; serves a major recreational facility; and serves a number of

adjacent residences. It is recommended that the Town consider constructing a sidewalk on the south side of Hampton Road.

Recommendations:

1. ***Implement 1.5m bike lanes, measured from the face of curb, on Hampton Road from Rothesay Road to Highland Avenue. Install appropriate bike lane markings and signage.***
2. ***Consider installation of sidewalk on the south side of Hampton Road, from Rothesay Road to Arthur Miller Fields.***
3. ***Consider widening Hampton Road from Rothesay Road to Summer Rose Lane to a desired 10m width, if the opportunity arises during future reconstruction efforts and if feasible based on property and utility constraints.***

Hampton Road

0.990 to 2.480 km: Highland Avenue to Quispamsis Boundary

Hampton Road from Highland Avenue to the Quispamsis Boundary features an 11.0 m wide, three-lane cross section with a thru lane in each direction and a centre turning lane. Sidewalks are provided on both sides of the street. There are many intersections and commercial accesses throughout this section as well as two traffic signals – one at Marr Road and one at Oakville Lane.

Curb-to-Curb Width:	11.0 m (3-lane cross-section)
Sidewalk:	1.5m both sides, adjacent to curb
Speed Limit:	50 km/h
AADT:	10,000 – 19,300
Truck Volume %:	1.3%

It is desirable to provide bike lanes on Hampton Road given that it is a primary corridor throughout Rothesay that provides direct access to many destinations and amenities. In order to accommodate bike lanes, roadway widening is required, either to the *Desired Standard* shown in **Figure 13** or the *Modified Standard* shown in **Figure 14**. The minimum roadway widening required is 2.0 m to achieve a 13.0 m cross-section (1.5 bike lanes, 3.5 m travel lanes, and 3.0 turning lane). Additional widening would be required to achieve the desired 1.8 m bike lanes and 1.0 m grassed boulevards shown in the *Desired Standard*. The feasibility and property impacts of widening

Hampton Road are being evaluated as part of the *Rothesay Traffic Study* and ongoing sidewalk design efforts by CBCL.

To enhance the safety and aesthetics of the corridor, pedestrian refuge islands and median boulevards are also proposed. The locations of these islands and medians must be selected strategically to minimize impacts on left turns at intersections and driveway accesses. An access management plan is being developed in the Rothesay Traffic Study in coordination with the location selection of the pedestrian refuge islands and landscaped medians.

The proposed enhancements to Hampton Road would significantly improve the corridor's appearance and "liveability" and make it much more accessible and attractive to pedestrians and cyclists.

Recommendations:

1. ***Widen Hampton Road to accommodate minimum 1.5m bike lanes, measured from the face of curb. Install appropriate bike lane markings and signage.***
2. ***Consider installation of grassed boulevards on both sides of the street between the sidewalk and the curb.***
3. ***Identify appropriate locations for pedestrian refuge islands and landscaped medians.***

7.2.5 Church Avenue

0.000 to 0.260: Hampton Road to Gondola Point Road

Church Avenue is classified as a Municipal Collector Street but is only 260m long, connecting Hampton Road to Gondola Point Road along the north side of Rothesay Common. Church Avenue provides access to several homes, St. Paul's Church and the Post Office.

Church Avenue is consistent with a Municipal Collector Street standard, with a curb-to-curb pavement width in the range of 9.6-9.8 m. Traffic volumes are low on Church Avenue, with AADT volumes of 2,200 vehicles per day.

Curb-to-Curb Width:	9.7 m
Sidewalk:	1.5m adjacent to curb, north side only
Speed Limit:	50 km/h
AADT:	2,200
Truck Volume %:	1.7%

Due to the low traffic volumes and frequent presence of on-street parking (although parking is not technically permitted), shared lanes are the recommended bicycle facility for Church Avenue. Sharrows should be painted to position the cyclist an appropriate distance away from parked cars to avoid conflicts with opened doors.

It would be desirable to have sidewalks on both sides of Church Avenue, given that it is a collector street and experiences parking on both sides of the street. The south side of the street also borders the Common where there is high pedestrian activity.

Recommendations:

1. ***Implement shared lanes on Church Avenue, and install appropriate Shared Lane signage and Sharrow pavement markings.***
2. ***Consider installation of sidewalk on the south side of Church Avenue.***

7.2.6 Grove Avenue

0.000 to 1.470 km: Hampton Road to Campbell Drive

Grove Avenue is classified as a Municipal Collector Street and is primarily a residential corridor, but also provides access between Hampton Road and Campbell Drive. Despite being a travel corridor from the Route 1/Route 111 interchange to Hampton

Road, AADT volumes are relatively low, ranging from only 3,100 to 3,500 vehicles per day.

Grove Avenue is consistent with a Municipal Collector Street standard, with a curb-to-curb pavement width in the range of 9.6-9.8 m. Sidewalk is provided on the east side only.

Curb-to-Curb Width:	9.7 m
Sidewalk:	1.5m adjacent to curb, east side only
Speed Limit:	50 km/h
AADT:	3,100 to 3,500
Truck Volume %:	2.1%

Grove Avenue plays an important role in the proposed AT Network, connecting several primary routes, including Campbell Drive, Hampton Road and the proposed AT route from French Village. Grove Avenue also provides access to Highland Avenue, a secondary AT route, and the proposed Hillside Trail.

Bike lanes are recommended as a cycling facility for Grove Avenue between Hampton Road and Campbell Drive. A cross-section consisting of 3.3-3.4m traffic lanes and 1.5m bike lanes is proposed and considered acceptable due to the lower volume of traffic, low truck traffic, and low speed limit (50 km/h).

It would be desirable to have sidewalks on both sides of Grove Avenue given the number of homes on the west side of the street and the street's role in the AT Network. The 670m section from Hampton Road to Highland Avenue is recommended as the priority section for sidewalk installation.

No AT facilities are recommended for Grove Avenue south of Campbell Drive.

Recommendations:

1. ***Implement 1.5m bike lanes on Grove Avenue, measured from the face of curb, and install appropriate bike lane markings and signage.***
2. ***Consider installation of sidewalk on the west side of Grove Avenue, with priority on the section from Hampton Road to Highland Avenue.***
3. ***Consider widening Grove Avenue to a desired 10m width, if the opportunity arises during future reconstruction efforts and if feasible based on property and utility constraints.***

7.2.7 Clark Road

0.000 to 0.870 km: Gondola Point Road to Hampton Road

Clark Road is classified as a Municipal Collector Street and is primarily a residential corridor, but it is currently the only street providing access between Gondola Point Road and the Hampton Road commercial district. Therefore, Clark Road plays an important role in the transportation network both for motor vehicles and active transportation.

Clark Road is consistent with a Municipal Collector Street standard, with a curb-to-curb pavement width in the range of 9.6-9.8 m. Sidewalk is provided on the east side only.

Curb-to-Curb Width:	9.7 m
Sidewalk:	1.5m adjacent to curb, east side only
Speed Limit:	50 km/h
AADT:	9,300 to 9,900
Truck Volume %:	1.6%

Bike lanes are recommended as a cycling facility for Clark Road. A cross-section consisting of 3.3-3.4m traffic lanes and 1.5m bike lanes is proposed and considered acceptable due to the low truck traffic and low speed limit (50 km/h).

It would be desirable to have sidewalks on both sides of Clark Road given that Clark Road has a number of homes on the west side of the street, is a route to the schools and arena, and plays an important role in the proposed AT Network.

Recommendations:

1. ***Implement 1.5m bike lanes on Clark Road, measured from the face of curb, and install appropriate bike lane markings and signage.***
2. ***Consider installation of sidewalk on the west side of Clark Road.***
3. ***Consider widening Clark Road to a desired 10m width, if the opportunity arises during future reconstruction efforts and if feasible based on property and utility constraints.***

7.2.8 Marr Road

0.000 to 1.400 km: Hampton Road to Campbell Drive

Marr Road is classified as a Municipal Collector Street and provides access to a number of land uses, including residential, light industrial, and commercial. Marr Road also provides an important connection between Hampton Road and Campbell Drive.

Marr Road is consistent with a Municipal Collector Street standard, with a curb-to-curb pavement width in the range of 9.6-9.8 m. Sidewalk is provided on the east side only.

Curb-to-Curb Width:	9.7 m
Sidewalk:	1.5m adjacent to curb, east side only
Speed Limit:	50 km/h
AADT:	10,400 to 10,700
Truck Volume %:	2.5%

Bike lanes are recommended as a cycling facility for Marr Road. A cross-section consisting of 3.3-3.4m traffic lanes and 1.5m bike lanes is proposed and considered acceptable as an interim retrofit solution.

Widening Marr Road to a desired 10 m cross-section should be pursued in the future, if feasible, to allow additional bike lane and traffic lane widths, given the grades on Marr Road and slightly higher volume of truck traffic.

It would also be desirable to have sidewalks on both sides of Marr Road given the mix of residential and commercial land uses on the west side of the street.

Recommendations:

1. ***Implement 1.5m bike lanes on Marr Road, measured from the face of curb, and install appropriate bike lane markings and signage.***
2. ***Consider installation of sidewalk on the west side of Marr Road.***
3. ***Strongly consider widening Marr Road to a desired 10m width, if the opportunity arises during future reconstruction efforts and if feasible based on property and utility constraints.***

7.2.9 Campbell Drive

Campbell Drive is classified as a Provincial Collector (Bypass) Highway from Hampton Road to Route 111 and a Municipal Collector Street from Route 111 to Grove Avenue. Campbell Drive is a primary access route to Route 1 and also provides access to large commercial developments in Millennium Park. AADT volumes range from 3,100 to 19,500 vehicles per day, with the heaviest volumes at Marr Road.

The AT facilities recommended for Hampton Road are described below for several roadway sections, each having individual characteristics to be considered. The road sections include:

- Hampton Road to Route 111 ; and
- Route 111 to Grove Avenue.

Campbell Drive

0.000 to 2.800 km: Hampton Road to Route 111

This section of Campbell Drive features a rural cross-section with 3.5 m travel lanes and paved shoulder widths of 0.5 to 1.0m. A gravel shoulder extends at least 1.0 m beyond the edge of pavement. The speed limit is 70 km/h throughout most of this section and traffic volumes are very high between Route 111 and Marr Road.

Campbell Drive is access controlled throughout this section, with only five access points, all of which are (or will soon be) signalized intersections: Route 111, Marr Road, Superstore Access, Millennium Drive, and Hampton Road.

Paved Width:	8.0 m
Sidewalk:	None
Speed Limit:	50 to 70 km/h
AADT:	11,500 to 19,500
Truck Volume %:	1.9-2.7%

Campbell Drive has been identified as a primary AT route given that it provides an important link between other proposed AT corridors and links various areas of the town including a popular commercial destination. It is also a route used regularly by recreational cyclists.

The existing characteristics of Campbell Drive are not ideal for active transportation, but a number of improvements are proposed to improve safety and accessibility for active transportation modes. First, it is recommended that the paved shoulders be widened to

1.75 m on both sides of the road from Hampton Road to Route 111. The paved shoulders are not intended to be a dedicated cycling facility, but available for use by both pedestrians and cyclists.

Second, the signalized intersections along Campbell Drive present some issues that need to be addressed upon making Campbell Drive an AT corridor:

- **Hampton Road Intersection** – The rural cross-section on Campbell Drive terminates 230 m upstream of Hampton Road. A curbed cross-section is then provided, tapering out to two travel lanes in each direction. There is currently insufficient width to accommodate bike lanes plus the four travel lanes. Widening of Campbell Drive should be considered to accommodate minimum 1.5 m bike lanes. A sidewalk should also be considered on the west side of Campbell Drive.

- **Millennium Drive Intersection** – Cyclists would be required to use the main traffic lanes to travel through this intersection. Alternatively, the edge of the curbed islands could be rebuilt to allow for dedicated bike lanes through the intersection. Cross-walks, sidewalk ramps, and button activated pedestrian signals should also be considered at this intersection to provide crossing opportunities for pedestrians and for cyclists should they choose to dismount at the crossings.

  The Town should also discuss with the landowner, the potential for a sidewalk or paved walking strip along Lacey Drive from Millennium Drive to the Superstore (170m).

- **Superstore Plaza Intersection** – Westbound cyclists are required to use the main traffic lanes to travel through this intersection. Alternatively, there may be an opportunity to stripe a dedicated bike lane through the intersection in the westbound direction.

  Cross-walks and button activated pedestrian signals should also be considered at this intersection to provide crossing opportunities for pedestrians and for cyclists should they choose to dismount at the crossings.

  The Town should also discuss with the landowner, the potential for extending the sidewalk from the parking area to Campbell Drive (40 m).

- **Marr Road Intersection** – This intersection presents challenges due to the limited shoulder width available on the south side of Campbell Drive as a result of the concrete barriers that provide separation from Route 1. An option has been developed to provide a continuous 1.75 m shoulder width on the south side by shifting the lanes slightly northward.

  It is also recommended that a north-south crosswalk be considered at Marr Road. The improvement option developed includes a 1.8m path along the back side of the traffic signal poles to direct cyclists and pedestrians to a safer refuge area when waiting to cross. A push button pole would be included next to the refuge area to activate the crossing signals. The improvement concept is provided in **Figure D.2** in **Appendix D**.

  In the westbound direction, cyclists would be required to mix with the traffic or dismount and use the sidewalks and pedestrian crossing.

- **Route 111 Intersection** – This intersection is currently being upgraded with traffic signals and channelized islands. Paved shoulders on Campbell Drive will end at this intersection. Appropriate crosswalks should be provided to link to the proposed AT infrastructure along Route 111.

An alternative AT solution to the above, or possibly a longer term solution in addition to the above, is to construct a 3.0m wide paved multi-use path along the north side of Campbell Drive from Route 111 to Hampton Road. This facility would likely appeal to a wider variety of users than a paved shoulder alone and would be on the development side of Campbell Drive, addressing some of the crossing issues noted above. One primary area of constraint that would need to be resolved is the limited space available in the northwest corner of the Campbell Drive/Marr Road intersection.

Recommendations:

1. ***Construct 1.75m paved shoulders along Campbell Drive from Hampton Road to Route 111.***
2. ***Install Bike Route signage, but no pavement markings.***

3. ***Consider improvements at the Hampton Road intersection:***
    a. *Widen Campbell Drive throughout the 230m curbed section approaching Hampton Road to accommodate 1.5 m bike lanes.*
    b. *Install sidewalk on the west side of this section.*
4. ***Consider improvements at the Millennium Drive intersection:***
    a. *Implement crosswalks and pedestrian signals;*
    b. *Consider moving the edge of the curbed islands to allow for bicycle lanes through the intersection.*
    c. *Discuss with the landowner the potential for a sidewalk along Lacey Drive.*
5. ***Consider improvements at the Superstore Access:***
    a. *Implement crosswalks and pedestrian signals;*
    b. *Consider moving the edge of the curbed islands to allow for bicycle lanes through the intersection.*
    c. *Discuss with the landowner the potential for a 40m sidewalk extension from the parking lot to Campbell Drive.*
6. ***Consider improvements at the Marr Road Intersection:***
    a. *Adjust the concrete barriers and lane widths to accommodate a 1.75 m paved shoulder on the south side of Campbell Drive.*
    b. *Add a north-south crosswalk and provide a refuge area and push button pole for pedestrians and cyclists wanting to cross Campbell Drive.*
    c. *Construct a sidewalk along the curbed section in the northwest corner of the intersection.*
7. ***Review the opportunity for a longer term AT solution of a 3.0m wide paved multi-use path along the north side of Campbell Drive.***

Campbell Drive

2.800 to 3.100 km: Route 111 to Grove Avenue

Campbell Drive from Route 111 to Grove Avenue is similar to a Municipal Collector Street standard. The curb-to-curb pavement width is in the range of 9.7m, but sidewalk is not provided.

Curb-to-Curb Width:	9.7 m
Sidewalk:	None
Speed Limit:	50 km/h
AADT:	3,100
Truck Volume %:	2.1%

Bike lanes are recommended as a cycling facility for this section of Campbell Drive. A cross-section consisting of 3.3-3.4m traffic lanes and 1.5m bike lanes is proposed and considered acceptable due to the low volume of traffic and low speed limit (50 km/h). The current white edge lines painted on Campbell Drive may be in an acceptable location to delineate these bike lanes.

It would be desirable to have sidewalks on at least one side of Campbell Drive, given that it is identified as a primary AT route. The north side of Campbell Drive is likely the better location for a sidewalk given that it would connect into the existing sidewalk on the east side of Grove Avenue. A pedestrian crossing at the Campbell Drive/Route 111 intersection should be provided to link the new sidewalk with AT facilities on Route 111.

Recommendations:

1. ***Implement 1.5m bike lanes on this section of Campbell Drive, measured from the face of curb, and install appropriate bike lane markings and signage.***
2. ***Consider installation of sidewalk on the north side of Campbell Drive and provide a pedestrian crossing at the Route 111/Campbell Drive intersection, as required to connect to Route 111 AT facilities.***
3. ***Consider widening Campbell Drive to a desired 10m width, if the opportunity arises during future reconstruction efforts and if feasible based on property and utility constraints.***

7.2.10 Millennium Drive

0.000 to 1.450 km – Campbell Drive to Quispamsis Boundary

Millennium Drive is classified as a Municipal Collector Street from Campbell Drive to Donlyn Drive and a Municipal Local Street from Donlyn Drive to the Quispamsis Boundary. Within Rothesay, Millennium Drive borders mostly undeveloped lands and its main function currently is as a connection to Quispamsis and Donlyn Drive.

Millennium Drive features a rural cross-section with 3.5 m travel lanes and paved shoulder widths of 0.5m or less. The shoulder edge drops off sharply. A gravel shoulder extends at least 1.0 m beyond the edge of pavement. The speed limit is 60 km/h throughout this section and traffic volumes are moderate.

Paved Width:	8.0 m
Sidewalk:	None
Speed Limit:	60 km/h
AADT:	8,100
Truck Volume %:	3.1%

Millennium Drive has been identified as a primary AT route given that it provides an inter-community function and links AT corridors in Quispamsis with proposed AT corridors in Rothesay.

To increase the safety of Millennium Drive as an active transportation corridor, it is recommended that the paved shoulders be widened to 1.5 m on both sides of the road from Campbell Drive to the Town boundary. The paved shoulders are not intended to be a dedicated cycling facility, but simply available for use by both pedestrians and cyclists. The intersection of Donlyn Drive does not pose any issues or constraints.

As the Millennium Drive corridor develops over time, enhanced AT infrastructure such as a paved multi-use pathway may be considered. This treatment was recommended to be considered for Millennium Drive in the *Quispamsis Active Transportation Plan*.

Recommendations:

1. ***Construct 1.5 m paved shoulders on Millennium Drive from Campbell Drive to the Town Boundary.***
2. ***Install Bike Route signage, but no pavement markings.***

7.2.11 French Village Road

0.730 to 2.130 – Wells Recreation Park to Dofred Road

French Village Road is classified as a Municipal Collector Street and is the primary access route between Route 111 and a large residential area. From Wells Recreation Park to Dofred Road, French Village Road features an urban cross-section and is consistent with a Municipal Collector Street standard. The curb-to-curb pavement width is in the range of 9.6-9.8 m and sidewalk is provided on the south side only.

Curb-to-Curb Width:	9.7 m
Sidewalk:	1.5m adjacent to curb, south side only
Speed Limit:	50 km/h
AADT:	5,700 (at west end)
Truck Volume %:	5.2%

The AT route on French Village Road formally begins at the intersection to Wells Recreation Park, where it links to the proposed AT Pathway to Route 1. At the east of French Village Road, the AT Route continues past Dofred Road, but only as a Secondary Route to serve the rural area.

Bike lanes are recommended as a cycling facility for French Village Road from Wells Recreation Park to Dofred Road. A cross-section consisting of 3.3-3.4m traffic lanes and 1.5m bike lanes is proposed and considered acceptable based on the volumes and travel speeds.

It would also be desirable to have sidewalks on both sides of French Village Road given that it is a collector street and serves a large number of residences off the north side of the street.

Recommendations:

1. ***Implement 1.5m bike lanes on French Village Road, measured from the face of curb, and install appropriate bike lane markings and signage.***
2. ***Consider installation of sidewalk on the north side of French Village Road.***
3. ***Consider widening French Village Road to a desired 10m width, if the opportunity arises during future reconstruction efforts and if feasible based on property and utility constraints.***

7.2.12 Fox Farm Road

0.000 to 0.600 km – Route 1 WB Ramps to Rothesay Road

Fox Farm Road is classified as a Provincial Primary Local Highway, connecting Route 1 to Rothesay Road (Route 100). Despite its function as a freeway connector, Fox Farm Road services relatively low volumes.

Fox Farm Road resembles a Municipal Collector Street standard with a curb-to-curb pavement width is in the range of 9.6-9.8 m and sidewalk is provided on the south side only. Edge lines are painted on Fox Farm Road, approximately 1.3m from the face of curb. These resemble bike lanes, but are not marked as such.

Curb-to-Curb Width:	9.7 m
Sidewalk:	1.5m adjacent to curb, south side only
Speed Limit:	50 km/h
AADT:	3,500 to 4,500
Truck Volume %:	1.4%

The AT route on Fox Farm Road formally begins north of the Route 1 westbound ramps and continues for a distance of 600 m to Rothesay Road.

Bike lanes are recommended as a cycling facility for Fox Farm Road. A cross-section consisting of 3.3-3.4m traffic lanes and 1.5m bike lanes is proposed and considered acceptable based on the low volumes and travel speeds.

It would be desirable to have sidewalks on both sides of Fox Farm Road given that it functions as a collector street and serves a number of residential streets on the east side.

Recommendations:

1. ***Implement 1.5m bike lanes on Fox Farm Road, measured from the face of curb, and install appropriate bike lane markings and signage. Bike lanes should be terminated where the curbed section ends, approximately 50m north of the Route 1 westbound ramp terminal.***
2. ***Consider installation of sidewalk on the east side of Fox Farm Road.***
3. ***Consider widening Fox Farm Road to a desired 10m width, if the opportunity arises during future reconstruction efforts and if feasible based on property and utility constraints.***

7.3 Secondary AT Roadway Corridors

Secondary AT Roadway Corridors generally provide a connection between primary AT corridors or connect a primary corridor with a large residential area or prominent destination.

The following routes have been identified as Secondary AT Roadway Corridors:

- Highland Avenue
- Chapel Road-Holland Drive
- Donlyn Drive
- Dobson Lane-Monaco Drive-Oakville Lane
- Renshaw Road
- Horton Road-Dunedin Road
- Wiljac Street-Neil Street-Beauvista Street
- Acadia Avenue
- French Village Road

These roads are all classified as Municipal Local Streets with the exception of Donlyn Drive, which is a Municipal Collector Street. These roads have pavement widths ranging from 6.0-7.5 m and mostly feature rural cross-sections.

Given that these routes are Secondary AT corridors, have low traffic volumes and narrower pavement widths, it is recommended that they only be signed with the “Bicycle Route Sign”. This treatment provides awareness to drivers that cyclists may be present, but it also serves an important wayfinding function for cyclists navigating the AT network.

There are some special considerations and recommendations for each route to enhance the facility for both cyclists and pedestrians. These are listed in **Table 16**.

Table 16 – Recommendations for Secondary AT Roadway Corridors

Roadway Corridor	Issue/Opportunity	Recommendation
Highland Avenue	• A 1.2 m wide sidewalk is provided throughout most of Highland Road except for 160 m on a curve near Kingswood Avenue, which is currently being installed.	• Replace the 1.2m sidewalk with 1.5m sidewalk during the next scheduled sidewalk replacement/ reconstruction effort.
Chapel Road-Holland Drive	• Currently Chapel Road and Holland Drive are not a continuous route, as there is a 120m gap between the ends of the roads.	• Construct a 3.0m hard-surfaced multi-use pathway between the roads to complete the AT corridor.
Donlyn Drive	• It would be desirable to provide a sidewalk along Donlyn Drive, given that it is a collector street and serves a large residential area.	• Construct a 1.5 m wide sidewalk with landscaped boulevard on the north side of Donlyn Drive, similar to the treatment on Highland Avenue
Dobson Lane-Monaco Drive-Oakville Lane	• The inclusion of this route as an AT Corridor is dependent on the ability to establish a trail connection from Dobson Lane to Monaco Drive across the rail line. • Oakville Lane provides little space for pedestrians approaching the Hampton Road intersection	• Construct a 3.0m multi-use path from Dobson Lane to Monaco Drive and make a request to CN Rail to establish a public trail crossing at the rail line. • Construct a 1.5m sidewalk on one side (preferably the east side) of Oakville Lane.
Renshaw Road	• In the absence of sidewalk on the south side of Rothesay Road, a crosswalk would be desirable for pedestrians crossing Rothesay Road to the north sidewalk.	• Consider installation of a crosswalk on Rothesay Road at Renshaw Road, once Renshaw Road is formalized as an AT Route.
Horton Road-Dunedin Road	• A sidewalk was recently constructed along one side of Dunedin Road. There is also an opportunity to upgrade the trail on the north side of Rothesay Road to a hard surfaced sidewalk/walkway.	• Consider installation of a crosswalk on Rothesay Road at Dunedin Road if the gravel path on the north side of Rothesay Road is upgraded to a concrete/asphalt pathway.
Wiljac Street-Neil Street-Beauvista Street	• Street widths range from 6.0 to 6.5m. It would be desirable to have a paved shoulder for pedestrian use. • This AT corridor is dependent on the Hillside Trail extending to Wiljac Street.	• Consider future construction of a 1.5m shoulder on one side of the street for pedestrians use. • The upgrades should be timed to take place in coordination with the completion of the proposed Hillside Trail.
Acadia Avenue	• No issues	
French Village Road	• Current chipsealed width is 7.5 m • Speed limit is 60 km/h	• Widening is desirable but would be of lower priority due to low traffic volumes. Widening should be considered when and if road is resurfaced with asphalt.

7.4 Primary AT Trails

Three Primary AT trails have been identified for the proposed AT Network. These pathways should be designed according the standards presented in **Section 6.5** of this report. A 3.0m wide hard surface is recommended, of either asphalt or reclaimed asphalt.

The features of each primary pathway are described below.

7.4.1 French Village Connection

The purpose of the French Village Connection is to provide a continuous active transportation link from French Village to Campbell Drive. Several barriers and challenges were reviewed and need to be addressed in establishing this link:

Review of Route 111

Route 111 is an arterial highway with high traffic volumes and a high speed limit (100 km/h). The narrow shoulders on Route 111 are not a desirable facility for walking or cycling. Even wider paved shoulders would not be attractive to most users. Therefore, an off-road facility was selected for the AT connection to French Village.

Use of Utility Corridor

An existing utility corridor with overhead power lines runs on the east side of Route 111 from Wells Recreation Park to a public road opposite Dolan Road, a distance of 2,180 m. The utility corridor is already cleared and offers an opportunity to construct a multi-use trail within the easement. Approximately half the length of the corridor falls within Town owned lands. The other half is in privately owned lands. The terms of the easement will need to be reviewed to determine the feasibility of using the corridor for a public trail.

Where the utility corridor intersects with the public road, it is recommended to direct the trail down the south edge of the right-of-way toward Route 111.

Crossing the Marsh

The utility corridor passes through a watercourse and marsh area. It is likely that a special crossing would be required to take the trail through this area, such as a boardwalk. This presents a challenge but also an opportunity for an attractive trail destination with a rest area and interpretive signage.

Crossing Route 1

Route 1 is the most significant barrier between French Village and the rest of Rothesay. To date, no suitable facility has been available for pedestrians and cyclists to cross Route 1; however, the new interchange currently under construction features a separated walkway on the west side of the bridge structure.

Crossing Route 111

Given that the walkway on the Route 1 interchange is on the west side of the structure, the route from the utility corridor must cross Route 111 at some location. Two options were considered for this crossing:

a) A pedestrian tunnel crossing beneath Route 111 northwest of the watercourse culvert.

b) An at-grade pedestrian crossing on Route 111.

It is expected that a tunnel would be cost-prohibitive or difficult to justify based on the number of users. Therefore, options were explored for the at-grade crossing.

The selected location for the at-grade crossing is at the Dolan Road intersection. Several treatments/improvements to the intersection are recommended to improve safety for pedestrians. These are presented in **Figure D.3** in **Appendix D** and described below:

1. A pedestrian refuge island is proposed in the hatched area on the north side of the intersection. This would be a raised curbed island that would allow for a two-stage crossing.

2. The sweeping right turn lane onto Dolan Road is removed and replaced with a smaller radius channelized right turn lane. This allows for a roadside multi-use trail to continue to the interchange and reduces the speeds of vehicles on Route 111 making that right turn. This is not expected to have an adverse impact on traffic operations.

3. The existing access to Bicentennial Park is relocated to Dolan Road and the old right-turn lane is converted to the Park access road. Slight widening would be required for two-way traffic. Removal of the access eliminates the conflict point on Route 111 and allows for the continuous multi-use path. Landscaping could be considered

between Route 111 and the multi-use trail to create a visual and sound buffer between the highway and the trail and park.

Connection to Campbell Drive

It is recommended that the multi-use path be continued along the west side of Route 111 to Campbell Drive, with appropriate crossings at the Route 1 ramp terminals. At Campbell Drive the multi-use path would terminate and users would cross at the new traffic signals to a new sidewalk on the north side of Grove Avenue or if heading east, could use the proposed paved shoulders on Campbell Drive.

Recommendations:

1. ***Construct a 3.0m hard-surfaced multi-use trail from Wells Recreation Park to Dolan Road using an existing utility corridor and a public road right-of-way.***
2. ***Consider use of a boardwalk crossing the marsh with opportunity for a rest area and interpretive signage.***
3. ***Cross Dolan Road at an at-grade intersection and implement the improvements shown in Figure D.3. Consult with NBDTI on the feasibility of these measures.***
4. ***Continue the 3.0m multi-use path to Campbell Drive along the west side of Route 111, using the new walkway on the Route 1 structure. Install appropriate trail crossings at the ramps.***

7.4.2 Hillside Trail

In 2011, the Town of Rothesay completed installation of a new water tower and water main in the vicinity of the Riverside Golf Course. An access road to the pipeline was constructed along the north edge of Route 1 from Grove Avenue to a point approximately 2.5 km to the west. The road then turns north for 700m before terminating just before Dunedin Road. The access road is for maintenance purposes only and is currently closed to public traffic. Ultimately, there are plans to upgrade the road to a collector street, but this depends on development of nearby lands and the timing of that is uncertain.

Until such a time that the road is upgraded to a collector street, it presents a great opportunity to be used as a public multi-use trail. The opportunity is not only for a recreation trail, but it would also

provide much more direct access to the Millennium Park area from the residential subdivisions in the Riverside area.
Several considerations and recommendations in formalizing the access road as a multi-use trail are as follows:

Surface Upgrade
The access road, herein referred to as the proposed Hillside Trail, features a 6.0m width and coarse gravel surface. The coarse surface is not comfortable for biking, walking, or running. The surface should be upgraded with a hard surface such as reclaimed asphalt, or at a minimum, crusher dust.

Extension to Fox Farm Road
Ideally, the Hillside Trail should continue west with a connection to Fox Farm Road. The proposed connection is shown at Wiljac Street. This option requires the least amount of new trail construction, but other options may be explored depending on land availability or property constrains.

One specific challenge in extending the trail to Fox Farm road is the presence of an environmentally sensitive area around Renforth Bog. A boardwalk along the edge of the bog may be an acceptable option and offers an opportunity for an interpretative rest area. Alternatively the trail may be diverted around the environmental boundary.

Secondary Trail Connections
Secondary trail connections should be constructed that provide access to Renshaw Road, and Horton Road/Dunedin Road. Rothesay Netherwood School has also expressed interest in developing a connection to the Hillside Trail to expand their cross-country network.

Parking
It is expected that the Hillside Trail would be a destination trail for recreational users. Therefore, parking should be provided at an entrance to the trail. The preferred location for the parking lot and entrance would be at Grove Avenue, but there is limited property available for the parking lot. One option may be to construct a cul-de-sac at the end of Grove Avenue to provide 7-8 parking spaces.

At the Fox Farm end there are public lands available between Neil Street and the Route 1 off-ramp that may offer an opportunity for parking and trail access. This issue will need to be explored in more depth if the Town moves ahead with the Hillside Trail project.

7.4.3 Fairvale Trail

The *Quispamsis Active Transportation* recommended a multi-use trail be constructed adjacent to the CN Rail corridor between Quispamsis Road and Gondola Point Road (in Rothesay). The primary intent of this trail was to provide an AT route between the QPlex and the Rothesay Arena. The opportunity and feasibility of this trail within the Town of Rothesay were reviewed as part of this study.

Review of CN Rail Corridor

Although CN indicated to Quispamsis that there was an opportunity to construct a trail within the rail right-of-way, it has been the experience of other municipalities, such as Kelowna, that CN's position can change and quash the trail plans. Therefore, it is recommended that the Town of Rothesay pursue options for a trail corridor adjacent to, but outside, the CN right-of-way.

There appears to be an opportunity for a trail right-of-way or easement on the north side of the rail right-of-way, with limited property constraints. Sections of public lands or rights-of-way are available that would be sufficiently wide for a trail corridor. There is also an existing section of trail to the sewage lagoon that may have an existing easement in place.

Secondary and Neighbourhood Trail Connections

The Fairvale Trail is intended in the long term to be part of an inter-community multi-use trail, but even if constructed in isolation could serve an important role in Rothesay's local AT network. The trail passes by the ends of several residential streets, such as Burns Avenue, School Avenue, Isaac Street, Dobson Lane, and Kirkpatrick Road. With secondary trail connections from these streets to the Fairvale Trail, residents would have an access to an east-west AT link to Clark Road.

There is also a significant opportunity to extend a trail from Dobson Lane to Monaco Drive. This secondary trail would intersect with the Fairvale Trail, providing connectivity from Fairvale to Oakville Acres and Hampton Road. This north-south access does not currently exist.

Recommendations:

1. ***Initiate planning efforts to establish a corridor for a multi-use trail along the CN Rail rail-of-way from Gondola Point Road to the Quispamsis Boundary. A tentative alignment should be prepared and***

discussions initiated with landowners on the north side of the rail corridor.

2. ***Initiate planning efforts to establish the secondary trail connections to nearby streets.***
3. ***Submit a request to CN Rail for a public rail crossing on the proposed Dobson-Monaco trail link.***
4. ***Coordinate plans with the Town of Quispamsis for a connection to their proposed railside trail.***

7.5 Secondary/Recreational AT Trails and Neighbourhood Connections

Secondary or Recreational AT Trails are multi-use trails that connect neighbourhoods to the AT Network, complete connections between Secondary AT Roadway Corridors, or serve a primarily recreational function. Secondary AT Trails are generally shorter than Primary AT Trails and serve a local user base. Secondary AT Trails should be designed with a 3.0m wide surface but would likely require only a crusher dust surface.

Eight Secondary AT Trails are proposed, with a total length of 8,230 m. The location, function, and challenges related to each of these trials are summarized in **Table 17**.

Neighbourhood Connections are short, strategic links within neighbourhoods that connect or "fuse" local streets together to improve the permeability of the neighbourhood for pedestrians and cyclists. These connections can make a great difference in accessibility and reducing travel distances for non-motorized travel.

There are several examples of informal neighbourhood connections throughout the Town, such as:

- Cove Crescent to Gondola Point Road (50 m);
- Spruce Street to Harry Miller School (75 m); and
- Fernwood Lane to Highland Avenue (80 m).

Mapping of all neighbourhoods and property boundaries were reviewed to identify potential neighbourhood connections. A total of 33 potential neighbourhood connections were identified, with a total length of 4,300m, or an average length of 130m. Detailed mapping of the proposed connections, including secondary trails, is shown in **Appendix C**.

Table 17 – Description of Secondary AT Trails

Secondary Trail	Length	Function/Opportunity	Challenges
K-Park Trail	1,100m	• Connects Park Drive to James Renforth Drive. • May partially double as an emergency access route out of K-Park.	• Approximately 700m of trail is within private lands. An easement would be required.
Riverfront Trail	1,700m	• Connects Renforth Park to East Riverside-Kingshurst Park along the river's edge. • This trail would be a significant destination for recreation and would likely attract users on a regional level.	• Armouring of the trail bed would be required to hold up against flooding and erosion. • Environmental permitting could be onerous. • Several private properties extend to the water. Agreements would be required with these landowners. • Construction cost could be much higher than other trails.
Higginson Trail	700m	• Connects Higginson Avenue to the proposed Hillside Trail. Much of the alignment is already within a public right-of-way.	• A short section of right-of-way/easement needs to be secured.
Renshaw Trail	450m	• Connects Renshaw Road to proposed Hillside Trail.	• A right-of-way/easement is required along the entire length of the trail.
Oakville Trail	850m	• Connects Clark Road to Monaco Drive, passing by Lennox Drive, Dobbin Street, and Sierra Avenue. • Provides a direct route from several subdivisions to Harry Miller Middle School, Rothesay High School, and the arena.	• A right-of-way/easement is required for most of the trail. The right-of-way could be negotiated as part of development agreements for the undeveloped lands.
Campbell Trail	870m	• Provides an alternative AT route along Campbell Drive for the Highland subdivisions. The purpose of the trail would be to provide a multi-use link to the Hillside Trail. • All of the trail could be constructed within the Campbell Drive right-of-way or public lands.	• The usage of this trail depends on the ability to make connections in to Islay Drive, Charles Crescent, and Highland Avenue.
Wells Trail	1,500m	• Connects the large residential area north of French Village Road to Wells Recreation Park and the proposed French Village AT Connection • The alignment of the trail follows the existing utility corridor and intersects with many local residential streets.	• Conditions of the utility corridor easement would need to be reviewed for feasibility of a trail.
Bradley Lake Trail	1,060m	• Connects the residential areas near Bradley Lake to French Village Road and the French Village AT Connection.	A right-of-way/easement would be required as well as complete trail construction.

Three examples of how the proposed network of secondary trails and neighbourhood connections impact travel distances from residential areas to common destinations are listed in **Table 18**. Reducing distances between origins and destinations can greatly influence a person's decision on whether to travel by car or to walk or bicycle.

Table 18 – Impacts of Secondary Trails on Travel Distances

From/To	***Without* Secondary/ Neighbourhood Trails**	***With* Secondary/ Neighbourhood Trails**
Kingswood Ave/Charles Crescent to Movie Theatre	2,400m	820m
Bel-Air Avenue/Aspen Drive to Rothesay Arena	2,370m	1,740m
Isaac Street/Kaitlyn Street to Sobeys	3,320m	1,450m

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8 Amenities and Streetscaping

8.1 Overview

Amenities and streetscaping elements help to bring an AT network to life, giving it a personality and a connection with the user. Some amenities are very functional, such as bike parking and appropriate signage, while others add to the comfort of the AT experience such as benches, fountains, planters, and aesthetic lighting.

End of trip facilities and amenities at major nodes and destinations are very important in promoting an AT network and making it more attractive and friendly to users.

Several amenities and streetscaping elements are discussed below that should be considered by the Town during implementation of the proposed AT network. These include:

- Route signage
- Bike Parking
- Lighting;
- Fountains.
- Planters
- Benches
- Receptacles
- Public Wash Facilities

8.2 Route Signage

Providing a way finding system that allows AT users to know the location of the key destinations and the direction in which they need to travel is critical in creating an effective AT network. In selecting the type of signage to be used, it is important to decide what information is presented and how it is presented. Signage typically shows the routes of the AT Network, public amenities/facilities, and location of key destinations along with distances through a hierarchical order of signage types as described below.

Signage Types

- Traffic Control Signs
- Trailhead and Orientation Signs
- Access Signs
- Distance and Directional
- Trail Markers

Traffic Control Signs

Regulating the activities conducted on the AT Network is the primary purpose of traffic control signs. Not only do these signs indicate what activities are prohibited or acceptable, but they provide the "rules of the road" so that all individuals can enjoy the routes in a safe manner. The TAC Bikeway Traffic Control Guidelines for Canada (2nd Edition) should be referenced for on-road and off-road regulatory, warning, and guide signage.

Trailhead and Orientation Signs

Providing a clear understanding of the AT network is the primary purpose of this type of sign, which displays the overall map of active transportation routes, information regarding each route, and etiquette in using the active transportation system. These signs would be located at major nodes and centers for the AT network and would provide the basic orientation as a welcoming guide to the network of routes.

These signs portray the graphic standards and iconography for the entire path finding system by using repetitive visual icons and a common graphic language. At trailheads, kiosks can used as bulletin boards for community events associated with active transportation and recreation.

Access Signs

These signs are used to identify entrance points to local trail routes. These are typically placed at secondary access points and may also display information about the trail system rules, amenities, and etiquette.

Directional and Distance Markers

Providing general direction and distance to destinations, these signs assist the user in assuring that they are going in the direction that they desire along with the distance remaining to their destination. The signs would be located at key junction points, at locations in proximity to key destinations or at intervals along AT routes.

Route Markers

Located along the primary routes, route markers are intended to augment the directional signage by providing assurance and direction that users are on the correct route to reach their destination.

It cannot be overly expressed that with all of the different types of signage potentially incorporated in an AT network, a recognizable visual icon be established that encapsulates the spirit of the AT

network with connection to the Town of Rothesay. Once an established icon is developed then a graphic design exercise should be conducted that would create the standardization of how the signage should be graphically organized and presented.

8.3 Bike Parking

8.3.1 Bike Racks

Due to their versatility, bicycles can be parked almost everywhere; however, not providing properly secure and designated parking areas could result in damages to surrounding landscape features or theft of bicycles. Therefore, providing a variety of structures for the secure parking and storage of bicycles is critical to attracting users to the AT network. Structures can also provide protection from weather to reduce the damage to bikes and add to the desirability of the users.

Design Principles

Generally, a proper bike rack will have two points of contact for a bike to be properly secured to a rack, which aids in the stability and security of the bicycles. Overhead bike shelters provide additional protection from the elements thus reducing wear and tear on the bikes.

Bike parking facilities should be located at key destinations to provide increased visibility, security, and convenience. The private sector could also be engaged in sponsoring bike racks which then could allow them to customize the bike rack as a marketing tool for their business.

Technical Guidelines

- Lengths for parking spaces for bicycles should be 1.8m long for typical bicycles;
- The width of the parking spaces should be a minimum of 0.7m wide while the space could be reduced to 0.5m wide if overlapping handles are acceptable.
- The minimum vertical clearances for spaces are 2.1m with a preferable height at 2.5m.
- Racks should be spaced at least 1.5m apart for access around the racks.

Guidelines for the number of single post bike racks are as follows:

- 1-2 single post racks for bus stops and park-n-ride.

- For small parks 1-4 single post racks should be provided while major parks should provide 3-8 single post racks;
- For schools, one single post rack per 25 occupants; and
- For commercial/destinations 3-8 single post racks
- At schools and major parks the single post racks may be substituted with a single bike shelter with multiple racks.

Bike racks will typically cost about $500 - $800 each excluding installation and shipping.

8.3.2 Bike Lockers

Bike lockers allow cyclist to store bicycles and other equipment related to cycling when the individual arrives at a destination where they will be spending a considerable amount of time. These typically are beneficial for security measures, but also protect the bike and equipment from the climatic elements.

Design Principles

- Lockers should be located at major nodes, destinations, or transit stops.
- The quantity of the bike lockers should be about two per destination.
- Bike lockers become an opportunity for the private sector to participate in the AT system by sponsoring or providing bike lockers around their establishment. This collaboration would promote the AT system and allow the business community to become more engaged in the system.

The rough cost will about $1,500 to about $2,000 per Bike Locker. These costs do not include installation cost or shipping.

8.4 Lighting

Street lighting for an AT system allows for travel and activities to be extended for pedestrians and cyclist when there is limited amounts of day-light. Street lights also play a role in the aesthetic appeal, including how they tie an AT network together and also tie to the image of the community.

Design Principles

- All AT trails that intersect with vehicular traffic should be well lit. This includes roadway crossings, paved shoulders and bike lanes which are typically lit to roadway standards.

- All trails not in direct contact with vehicular traffic should be lit in accordance to the intensity of use and purpose of the trail. Generally these trails will be lit in specific areas or lit along the entirety of the trail if used a major commuter route.
- In addition to aesthetic appeal, the light distribution patterns should also be a consideration in the type of fixture selected. These patterns are classified as Type I, II, III, IV, and V. Typically for bike paths Type I and II are used, while Type III, IV, and V are for spaces that involve vehicular usage. Choosing the correct type of light distribution will ensure that the recommended illumination is provided while limiting excessive lighting for the route surroundings

Technical Guideliens

- Lighting requirements along roadsides are 10 lux for commercial zones, 6 lux for intermediate areas (i.e. libraries, schools, and apartment complexes), and 2 lux for residential.
- The uniformity coefficient should be maintained for residential streets at 6:1 while more commercial streets should be at a ratio of 3:1.
- All trails not in contact with vehicular traffic should be lit with a minimum of 5 lux with a maximum uniformity coefficient of 6:1.
- Height of lamppost located along roadways should be 10m tall while all other trails should a minimum 6 m tall with a lateral clearance of at least a 1 m.
- Spacing of lampposts is determined by the required illumination and uniformity coefficients.

A light fixture similar to the style used in Rothesay (as illustrated) would provide a 10 lux with an illuminated area of 18.3m x 6.1m and typically would cost about $3,500 per unit (excluding conduit and base costs).

8.5 Drinking Fountains

Public drinking fountains are a worthwhile enhancement for an AT network. Providing individuals access to water while using the network of paths is good for the individual's wellbeing and comfort. These facilities have multiple designs and uses to meet the needs of various user groups.

Design Principles

- The main consideration in selecting a drinking fountain is to determine what needs are required. Drinking fountains now provide opportunities for refilling water bottles at specially designed receptacles and provide drinking water for pets as well. Drinking fountains also can be designed to reduce the need of some utilities by allowing excess water to return back into the environment and potentially eliminating the need for a sewage connection.
- Location and numbers of fountains should be determined by the intensity of use at the major nodes and destination centres.
- Style and material should be determined for durability and aesthetic consistency with the style of the site furniture selected for the AT network and the character of Rothesay.

8.6 Benches

Seating in an AT network is used for two primary reasons: a) to relax after exerting high levels of energy and b) to observe the natural surroundings. These elements seam contrary to the intention of the AT system; however they provide much comfort to the users of the system.

Design Principles

- Benches should be located a major destination nodes, intermediate nodes, at the end of steep/long grades, and potentially at popular transit stops.
- Benches should be placed so that they do not cause an obstruction of the users utilizing the routes and provide the proper amount of space for seated individuals to re-engage the active transportation system.
- Quantity of benches should be determined by the intensity of use at each location.
- Selecting a style of bench should be based on maintenance requirements, durability, and finally ergonomic/aesthetic appeal.

8.7 Planters

Planters provide the opportunity for the implementation of vegetation at major nodes, starting points of the network of paths, and along significant pedestrian spaces. These items typically require low maintenance except for the up keep of the planting material.

Design Principles

- Planters should be located at major nodes and destinations or along streetscaped corridors.
- Planter types will need to be selected to be analogous in style and colour with the selection of the surrounding benches and light fixtures. They should also be durable for the areas that they are located.
- Planters typically are to be located around benches with a standard configuration of two planters on either side. This is conditional that the planters do not obscure or obtrude between the seating area and the trails.

8.8 Garbage Receptacles

Providing receptacles so that individuals can throw their refuge away helps maintain a clean and safer AT network. These receptacles should tie into the existing style of site furniture and be selected based on the different types of refuge collection the Town would see fit such as recyclables, compost, and etc.

Design Principles

- Similar to planters, receptacles should be located at major nodes and destination, but could be located at the start and along routes where individuals could benefit from properly disposing of refuge in a designated receptacle.
- Style of the receptacles should, along with planters, complement and work with the new and existing street furniture.
- Design features such as cover or spring loaded closers should be considered. These will be helpful in keeping animals out of receptacle and ensure that the garbage remains in the receptacle during strong weather. Durability and the life cycle cost should also be considered when selecting a receptacle style.

8.9 Public Wash Facilities

Providing public facilities at major nodes and destinations adds to the enjoyment of the users of the AT network. These facilities are some of the few physical structures located on the network of routes and add to the visual identity of the AT system. These facilities will typically require professional consultation for design and construction.

Design Principles

- Facilities should be built so that they are durable and as maintenance free as possible to reduce cost to town staff.
- Facilities should incorporate some of design qualities established for the AT network while being consistent with the character of the Town of Rothesay.
- Size and usage should be determined by the intensity of the surrounding areas and the applicable governing regulations.

9 Maintenance and Other Design Considerations

9.1 Overview

Active Transportation facilities are subject to surface deterioration and debris accumulation and need maintenance to function well. Poorly maintained facilities may become unusable for users.

A good maintenance program protects public funds invested in bikeways, so they can continue to be used effectively.

The maintenance costs and liabilities involved in the installation of a public cycling and pedestrian network must be acknowledged by the Town. A good maintenance program protects public funds invested in bikeways, so they can continue to be used effectively.

There are also other roadway and drainage design features that should be considered when implementing active transportation facilities. Upgrades to these features may fall into annual maintenance programs or during reconstruction efforts.

9.2 Street Sweeping

Significant amounts of sand and gravel can accumulate on the edges of roadways following winter sanding operations and where gravel driveways enter the roadway. These areas pose a hazard to cyclists, particularly for road bikes that are not designed for handling on loose surfaces. Sharp pieces of gravel can also puncture the tires on road bikes. It is recommended that the Town monitor and address areas of gravel accumulation and prioritize springtime street sweeping along primary AT corridors. It would also be beneficial to consider paving the approaches of gravel driveways that tend to be particularly problematic.

Accumulation of wet leaves on pathways or in roadway gutters also present a serious obstacle to cyclists. It is difficult for cyclists to stop on leaves and leaves can hide potholes, drainage inlets, or debris. It is recommended that excessive fallen leaves be removed from the travelled portion of cycling routes as soon as possible to reduce the potential for incident.

9.3 Snow Clearing

Ideally, sidewalks and roadway cycling facilities should be kept clear during winter months to accommodate users year round. In most cases, the primary AT corridors follow collector or arterial streets, which should receive priority of snow clearance. The

Town should also monitor these corridors regularly to ensure that the facilities are clear of snow and ice.

The Town may choose not to clear Primary AT Trails during the winter months so that they can be used for recreational purposes such as cross-country skiing or snow-shoeing.

9.4 Sidewalk Cross-Slope at Driveways

Driveway approach ramps often result in undesirable sidewalk cross slopes and/or abrupt transitions at the edges of the ramp. Rapid changes in grade and cross slope are hazardous for pedestrians using wheelchairs or walking aids and are uncomfortable for walkers and runners.

Efforts should be made to introduce designs that minimize abrupt changes in sidewalk grade and cross-slopes. Treatments that might be considered include:

- A continuous curb and sidewalk drop to minimize frequent grade changes where there are multiple, closely spaced driveways;
- Introduction of continuous boulevards or at least short boulevard sections to allow for level sidewalks at driveways; and
- More gradual flare transitions.

9.5 Curb Systems

Many municipals require the use of combined concrete curb and gutter in their street design standards. The rationale behind curb and gutter is to provide a drainage channel along the edge of a roadway that is made of a continuous material with no joints. Ideally, water will shed to this concrete channel and will not permeate into the roadway bed. However, in practice, there are cases where the concrete gutter elevation is set slightly higher than the pavement elevation or the pavement separates from the gutter edge. In these situations, water sheds only to the gutter edge and consequently chases the concrete-asphalt seam and permeates to the roadway bed, causing further cracking and separation due to erosion and freeze-thaw damage.

Examples of curb systems in Rothesay, with and without concrete gutter, are shown in **Figure 18**.

For cyclists, it is well documented that the use of curb only is a preferable drainage treatment to concrete curb and gutter. A concrete gutter typically extends 400mm into a bike lane and presents a hazard to cyclists if there is any elevation differential, cracking, or asphalt separation. It is recommended that the Town consider changing its roadway design standards to use curb only. This is expected to reduce deterioration along asphalt edges, provide more usable space for cyclists, and increase safety.

Figure 18 – Curb System Examples in Rothesay

Curb and Gutter System
Elevation Differential

Curb and Gutter System
Pavement Deterioration

Curb Only System
No apparent issues

9.6 Pavement Edge Repair

The roadway edge is often the first part of the roadway that experiences pavement cracking or break-up. This is also the area that is most travelled by cyclists. Repairs of this nature cannot wait for a general resurfacing of the roadway.

Pothole and pavement repairs are often reported by the public; however repairs along the edge of a roadway may not be as visible to motorists and the majority of users. The Town should take advantage of cyclists' input to help identify these types of pavement problems. Some cities, such as Ottawa, produce wallet-sized cards with the appropriate numbers for cyclists to call to report problems. These and other means should be considered to both promote and improve the pavement repair process.

9.7 Catch Basins

Catch basins are typically located on the edge of curbed roadways and are therefore in the area that is most travelled by cyclists. Catch basins pose a number of issues for cyclists, including unfriendly grate design, elevation differential with the road surface and pavement deterioration around the catch basin edges. Any of these issues pose a safety risk to cycles and should be addressed.


Bicycle Friendly Catch-Basin

Bicycle Friendly Catch Basin Grates

Catchbasin grates with slots parallel to the roadway, or a gap between the frame and the grate, can trap the front wheel of a bicycle, causing loss of steering control. If the slot spacing is wide enough, narrow bicycle wheels can drop into the grates. Conflicts with grates may result in serious damage to the bicycle wheel and frame as well as injury to the cyclist.

The Town has grates in use that have slots perpendicular to the roadway, which are considered to bicycle friendly. If there any grates in service that could potential trap a bicycle wheel, they should be replaced with a friendlier version.


Catch Basin on Rothesay Road

Catch Basin Location and Elevation

Some catch basins in Rothesay are either located away from the curb or are sunken below the pavement surface, or both. The Town has been working at replacing catch basins covers so that they are located against the curb and set flush with the pavement surface. For example, catch basin covers on Grove Avenue and Gondola Point Road were re-set in 2012. This effort should continue with priority on the most heavily travelled corridors like Rothesay and Hampton and priority on catch basins with the most severe conditions.

When re-setting the covers, efforts should be made not to depress the catch basin unless absolutely necessary for drainage purposes. If the catch basin must be depressed, the transitions should be gradual to avoid abrupt elevation changes.

10 Implementation Plan

10.1 AT Network Priorities and Phasing

One of the key objectives of this Active Transportation Plan was to develop a 5-year implementation plan that is technically feasible and financially achievable. A proposed AT Network has been developed including on-road and off-road facilities, such as bike lanes, paved shoulders, new sidewalk, and multi-use trails. It is unlikely that the many opportunities identified for the AT Network could be completed within a 5-year timeframe. Therefore, priority projects have been identified for 5-year implementation, while the remaining projects have been recommended for a 5+ year timeframe.

A phasing program based on three priority levels has been established. The priority levels correspond with the following implementation timeframes:

- Priority 1: 0-2 years
- Priority 2: 2-5 years;
- Priority 3: 5+ years.

Factors considered in setting priorities for implementation included the following:

- Ease of implementation;
- Potential for greatest positive impact;
- Funding availability or ability to program into upcoming budgets;
- Ability to make use of existing infrastructure;
- Timeline for possible environmental, infrastructure, and land acquisition issues;
- Ability to link locations and overcome significant barriers;
- Coordination with other municipal or development projects; and
- Logical design and construction sequence.

Although the priorities correspond to specific planning timeframes, the implementation plan must remain flexible to match budgets, coordination with other projects, and longer than expected planning and design timelines.

The complete implementation plan is outlined in Appendix E, listing specific recommendations, locations, cost estimates, and implementation timeframes.

Based on this proposed plan, within the 5-year implementation plan, the following active transportation infrastructure would be put in place:

- 17 km of roads with striped, dedicated bike lanes;
- 0.6 km of roads with signed and marked shared lanes;
- 9.1 km of secondary, signed bike routes;
- 4.4 km of paved shoulders on primary AT routes;
- 6.0 km of additional sidewalk;
- 7.0 km of hard surfaced multi-use trails; and
- 7.1 km of gravel surfaced multi-use trails.

In the 5-10 year implementation period, the following additional infrastructure would be in place:

- 0.2 km of dedicated bike lanes;
- 0.6 km of paved shoulder on secondary routes;
- 11.5 km of additional sidewalk or sidewalk replacement;
- 1.4 km of additional paved multi-use trails; and
- 4.1 km of additional gravel surfaced multi-use trails.

10.2 **Budget Estimates**

Opinion of probable construction and installation costs were developed for each recommendation of the implementation plan. The details of the costing are provided in the tables in **Appendix E**.

The total cost of the 5-year implementation plan is $3.79 million, which equates to an annual investment of approximately $750,000. Beyond 5 years, the total cost of recommended improvements is $3.08 million. The initial 5-year plan is ambitious, but some of the capital costs required may already exist within annual or projected budgets for maintenance and street renewal (e.g. Hampton Road widening and sidewalk installations).

A summary of the overall implementation plan costs by AT Network Component is provided in **Table 19**. A summary breakdown by AT facility type is provided in **Table 20**.

The cost estimates presented do not include HST, land acquisition costs, or engineering costs. The cost estimates should also be treated as preliminary and used for planning purposes only. Exact costs will depend upon detailed designs and the prevailing bidding climate at the time of implementation.

Table 19 – Total Cost Estimates by AT Network Component

AT Network Component	0-2 Years	3-5 Years	5-10 years	Total
Primary AT Roadway Corridors	$529,330	$1,473,860	$1,434,200	**$3,437,390**
Secondary AT Roadway Corridors	$45,300	$233,600	$306,700	**$585,600**
Primary Trails	$390,000	$695,400	$285,000	**$1,370,400**
Secondary Trails	$0	$284,750	$956,900	**$1,241,650**
Neighbourhood Connections	$38,450	$103,900	$92,800	**$235,150**
Total	**$1,003,080**	**$2,791,510**	**$3,075,600**	**$6,870,190**

Table 20 – Total Cost Estimates by AT Facility Type

Type of AT Improvement	0-2 Years	3-5 Years	5-10 years	Total
By Total Cost Estimate				
Bike Lanes and Signage (No Widening)	$87,630	$39,660	$0	**$122,700**
Road Widening for Bike Lanes	$60,000	$737,900	$99,100	**$897,000**
Paved Shoulders	$132,300	$263,300	$28,500	**$424,100**
Sidewalks and Crosswalks	$271,800	$565,100	$1,613,300	**$2,450,200**
Trail Development	$451,350	$1,185,550	$1,334,700	**$2,971,600**
Total	**$1,003,080**	**$2,791,510**	**$3,075,600**	**$6,870,190**
By Kilometres				
Bike Lanes and Signage (No Widening)	15.1 km	10.0 km	0 km	**25.1 km**
Road Widening for Bike Lanes	0.1 km	1.5 km	0.2 km	**1.9 km**
Paved Shoulders	1.5 km	2.9 km	0.6 km	**4.9 km**
Sidewalks and Crosswalks	1.9 km	4.1 km	11.5 km	**17.5 km**
Trail Development	6.8 km	7.3 km	5.5 km	**19.6 km**

10.3 Education and Promotion

The physical infrastructure is only one component of the implementation of a successful active transportation network. Education, promotion, and awareness are also critical elements that must be taken into consideration.

Education and awareness are paramount for a safe and legitimate AT network. Both motorists and AT users must be well informed on network facilities and how to safely interact with each other. Part of this is simply mutual respect and an understanding of user needs and limitations. Promotional and marketing strategies contribute to the incentive to use the network and also raise awareness of bike and walking to the general public.

The Town should undertake and adopt a comprehensive promotion and education strategy for the Active Transportation system.

The Town should undertake and adopt a comprehensive promotional and education strategy that not only promotes the physical network, but also delivers a message about Active Transportation and its benefits. Promotional tools include a signage strategy, website, social media, and community events.

Town staff should also work with Town Police and the School District to introduce active transportation education in schools. The Town should also consider supporting a "Police on Bikes" community policing unit to interact with AT users and be a non-motorized presence on the roadway.

10.4 Regional Perspective

10.4.1 Coordination with Neighbouring Communities

Town of Quispamsis

The Town of Quispamsis completed an Active Transportation Plan in 2011 and has been working to implement the recommendations from that plan. The following roadways have been identified as AT routes in both Towns:

- Millennium Drive;
- Hampton Road;
- Vincent Road;
- Gondola Point Road; and
- French Village Road.

A meeting was held with Quispamsis town staff in October 2012 to discuss the recommendations of the Rothesay AT Plan and opportunities for coordination of AT facilities across the Town boundary. A summary of the discussion and suggestions are as follows:

Millennium Drive

Quispamsis has plans for an off-road multi-use trail adjacent to Millennium Drive. It is planned that this trail would be located on the south side of Millennium Drive to eliminate conflict with driveways and take advantage of a vacant strip of land between Millennium Drive and Route 1. Quispamsis indicated that this trail could be implemented in the short term. Rothesay staff expressed interest in continuing this path to Campbell Drive as an alternative to paved shoulders on Millennium Drive as previously recommended in this Plan. One constraint that will need to be addressed is that the Route 1 right-of-way extends past where the trail is likely to be located. Therefore, agreement is required from NBDTI.

Another alternative for a multi-use trail adjacent to Millennium Drive is to formalize the trail space that has been allocated behind the developed lands on the north side of Millennium Drive in Quispamsis. Rothesay has similar plans to allocate space for this trail as lands develop.

If a multi-use trail is selected treatment, rather than paved shoulders, then the trail should be hard-surfaced as many cyclists expressed a need for better infrastructure along the Millennium Drive corridor.

Hampton Road

Quispamsis staff expressed interest in reviewing options for Hampton Road that could accommodate bike lanes similar to the concept proposed for Rothesay. However, Quispamsis staff noted there are difficulties in widening Hampton Road due to property and slope constraints.

Vincent Road

Quispamsis has identified Vincent Road as an AT Collector Street and has implemented shared lanes as the AT facility. Given the traffic volume on Vincent Road and available width, it was the original recommendation of this Plan for Rothesay to install bike lanes; however, it would be desirable to maintain a consistent facility across the Town boundary and given that the length of Vincent Road is very short within Rothesay limits, the Town of Rothesay should implement shared lanes on Vincent Road, at least initially. The two Towns should discuss plans for a possible future upgrade to bike lanes.

Gondola Point Road

At the Town boundary, the physical character of Gondola Point Road changes from a street with curb and sidewalk within Rothesay to a street with shoulders and ditches within Quispamsis. Currently, Quispamsis has designated Gondola Point Road as a shared route, with a 1.0 paved walking/cycling strip on the east side of the road. Quispamsis staff indicated that they may upgrade to a more robust AT facility in the future such as a wide shoulder on both sides or a curbed roadway with bike lanes and sidewalk.

French Village Road

At the Town boundary, French Village Road is a rural roadway with narrow shoulders and swales. In this Plan, it has been recommended to identify this portion of French Village Road as a Secondary AT Route with bicycle route signs only. This is more or

less consistent with the AT classification and treatment being implemented by Quispamsis.

City of Saint John

The City of Saint John completed a *Trails and Bikeway Strategic Plan* in 2010. Rothesay Road was identified as an AT corridor out to the Rothesay Town Limits. In 2010, the City installed bike lanes and sidewalk on 900m on Rothesay Road between the Brookville quarry and Colony Road. The timing for the complete upgrade of Rothesay Road is not known. Although it has been identified as a short term project for the City, the availability of funding may postpone this project for a period of time.

There has also been mention of a future trail system connecting from the City to the Renforth Bog area, but details on this are limited and timing is unknown.

10.4.2 Trans Canada Trail

The New Brunswick Trails Council (NB Trails) is working to establish a route for the Trans Canada Trail through southern New Brunswick. The current plan for the Kennebecasis Valley is to follow Rothesay Road and Gondola Point Road and then take the Gondola Point Ferry to the Peninsula and continue to Hampton.

At this point, NB Trails plans to use on-road routes through Rothesay and Quispamsis given the limited opportunity for off-road trails along the river; however, NB Trails has also indicated that if off-road routes can be identified then there may be funding available from Trans Canada Trails for construction. The only off-road option the appears to be viable for any distance is an alignment just north of Vincent Road from Gondola Point Road to Quispamsis Road. The east end of this trail has already been constructed and Quispamsis has plans to extend it to the west. The connection to Gondola Point Road would fall within the Rothesay Town Limits. This trail would benefit both communities and would provide a nice option for the Trans Canada Trail. It is recommended that both Rothesay and Quispamsis work on developing this trail connection and coordinate work with NB Trails.

10.4.3 New Regional Governance

In December 2011, the provincial government announced a broad range of actions to create a new Local Governance System in New Brunswick to increase collaboration, communication and planning between communities. The establishment of 12 Regional Service Commissions was proposed as the mechanism to help

communities communicate and collaborate regionally, as well as plan on a regional basis. Within each region, a new Regional Service Commission will have three main roles:

- Delivering, or facilitating the delivery of mandated services to communities.
- Facilitating voluntary service arrangements among interested communities.
- Acting as a regional forum for collaboration among communities on regional issues.

The proposed Commissions will be required to provide services such as Policing, Solid Waste Management, Local and Regional Planning. The Regional Service Commissions will also be responsible for facilitating the planning and **cost-sharing of major sport, recreational and cultural facilities**. The new Regional Service Commissions will also be the entity through which Municipalities, Rural Communities and Local Service Districts come together to identify and reach consensus on the need, the scope and the financing required for such new facilities (could include the expansion / renovation of existing facilities). Such agreements could be developed by the Commissions on a fully regional or on a sub-regional basis and would cover both initial capital and on-going operational costs.

One of the most relevant implications for the Town of Rothesay with regard to the proposed Regional Commission model is that, once implemented, provincial funding support for major infrastructure will be contingent upon obtaining support from those communities expected to benefit from the capital project. For example Provincial support for Regional Active Transportation initiatives could be contingent upon the support from all the communities in the Greater Saint John catchment area.

Pending full implementation of the Provincial regional service model, scheduled for 2013, municipalities have begun examining models for inter-municipal / regional cooperation for recreational services. In 2009 a comprehensive analysis of New Brunswick's sport and recreation infrastructure was commissioned by Recreation New Brunswick in partnership with the Government of New Brunswick. A resulting report, New Brunswick Recreational Infrastructure Renewal Strategy, identified six critical pillars that are the foundation to a New Brunswick Recreational Infrastructure Renewal Strategy.

1. Province wide strategic focus on citizen healthy/active living.

2. Development of New Brunswick recreation facility standards.
3. Values-based recreational infrastructure system planning.
4. Incentives for a collaborative regional approach to planning, construction and operating large-scale recreation infrastructure that compliments neighbourhood-community infrastructure.
5. Innovative partnering, designing and management of recreational facilities.
6. Dedicated 25-year recreational infrastructure investment program.

Recreation New Brunswick believes that the new regional governance model provides optimism for the future of recreation in New Brunswick; "The development of "Regional Recreation Commissions" would address a number of issues. Firstly, it would ensure that the recreation resources of a region are equitably utilized and accessible and that the recreation resources of an area are equitably supported by all users of the region. Secondly, by providing a mechanism that allows for input from all users of the region's recreation resources and any future resources, we ensure that there is a means whereby residents have an opportunity to provide input into the system and receive feedback. Finally, it provides the networking and cost sharing mechanism to ensure that all resources are managed properly and that we do not experience further losses or declines in our recreation assets."[8]

[8] Submission to the NB Department of Local Government Consultation on Enhancing Local Governance presented by Recreation New Brunswick, Submitted by J. Shanks, April 14, 2011