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Active transportation and community health in CBRM

Active transportation and community health in Cape Breton Regional Municipality

This document was prepared for Cape Breton Regional Municipality by IndEco Strategic Consulting Inc.

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Executive Summary

Cape Breton Regional Municipality (CBRM) is one of many Canadian municipalities that have articulated a commitment to active transportation. This report addresses the following questions:

1 How viable are active modes of transportation in CBRM?

2 What are the benefits of active transportation for CBRM?

3 How can CBRM move forward on active transportation?

The viability of active modes of transportation in CBRM

As of 2006, 90% of CBRM commuters usually traveled to work by vehicle. Only 6% walked to work, and only 0.2% cycled to work. However, walking and cycling are viable modes for many trips in CBRM, and there is significant opportunity to increase their use:

- Over half of CBRM residents could cycle to work in under 25 minutes, and about 15% of CBRM residents could walk to work in under 25 minutes.
- There is a latent demand for active transportation; 67% of CBRM municipal staff reported that they would like to walk or cycle to work if there was a dedicated facility that brought them to their workplace in 30 minutes.
- In other Canadian municipalities that are similar to CBRM, investments in active transportation have yielded significant increases in mode shares. For example, from 2001 to 2006, Moncton increased its cycling mode share from 0.6% to 1.0%.

The benefits of active transportation for CBRM

In Canadian communities large and small, increasing the use of active transportation provides health benefits, economic benefits, and quality of life benefits – thus contributing to municipalities' long-term vitality.

Active transportation and health

Increasing the use of active transportation is a cost-effective public health intervention that shifts the focus to prevention, rather than treatment. The health benefits of active transportation include:

- **Increased physical activity and prevention of chronic disease.** Active transportation is one of the easiest ways to obtain physical activity, as it is incorporated into daily life. Increasing the use of active transportation increases physical activity levels, and prevents chronic diseases including cardiovascular disease, breast and colon cancer, and Type 2 diabetes.
- **Prevention of premature death.** Physical activity from active transportation reduces the risk of premature death from all causes. Based on the WHO Health Economic Assessment Tool,

about 7 premature deaths could be prevented *each year* if 12% of all CBRM residents used active modes for one trip each day.

- **Reduced economic burden.** Increasing physical activity through active transportation would reduce the health care costs and economic productivity losses associated with chronic diseases.
- **Improved mental health.** Physical activity reduces the symptoms of several mental illnesses, and improves mental health in people without specific disorders.
- **Prevention of falls and trauma.** Being physically active reduces the risk of falls and fall-related injuries; this is particularly important for elderly people.

By investing in active transportation, municipalities can also prevent collisions, reduce air pollution, and reduce greenhouse gas emissions.

Economic returns of active transportation

The CBRM Mayor's Strategy calls for a focus on economic development, infrastructure improvements, job-creating opportunities, and "a modern approach to get the job done". Investments in active transportation align with these goals and provide the following returns:

- **Reduced household transportation costs.** By replacing vehicle trips with active transportation trips, households can reduce their expenditures on fuel and vehicle maintenance costs. They may also be able to reduce the number of vehicles they own.
- **Increases in real estate value.** Investing in safe and attractive walking and cycling environments can increase the value of residential and commercial properties.
- **Local jobs, tourism and economic activity.** Investments in walking and cycling can create jobs and generate new tourism. Expenditures of pedestrians and cyclists are also more likely to remain in the local economy than money spent on gasoline.
- **Cost-effective infrastructure investments.** Active transportation infrastructure is inexpensive relative to roads. Investments in walking and cycling facilities are also very cost-effective.

Active transportation, quality of life and community vitality

According to the Integrated Community Sustainability Plan, CBRM is committed to enhancing quality of life for all residents, young and old, and to encouraging the development of a vibrant urban core. Active transportation is tied to this vision, as it provides the following benefits:

- **Mobility for people of all ages, income levels, and abilities.** Investments in active transportation increase quality of life for non-drivers (e.g. children, seniors, and people living on a fixed income), and provide all residents with transportation choices.
- **Social interaction, community cohesion and vibrant places**. Safe and attractive walking and cycling environments are

vibrant places where people want to spend time, and are more likely to interact with other community members.

- **Local business success**. Interventions to improve the walking and cycling environment increase pedestrian activity and help generate sales for local businesses.
- **Resident and business attraction and retention**. Today's young professionals want to live in walkable communities with a variety of transportation options. Because quality of life factors affect skilled workers' decisions about where to live, they also affect business location decisions. Investments in active transportation can therefore be viewed as an economic development strategy.

Moving forward on active transportation in CBRM

CBRM adopted the Active Transportation Plan (AT Plan) in 2008, and has made commendable progress on implementing the AT Plan. However, the commitment to active transportation has not yet been institutionalized in CBRM, and many aspects of the plan have not yet been implemented. Active modes are not yet safe, convenient and enjoyable enough to attract large numbers of users. Moving forward on active transportation in CBRM involves the following next steps:

1. **Institutionalize active transportation within municipal policies and standards.** Cementing active transportation in municipal policies makes active transportation-friendly options the default options. CBRM can begin by adopting the formal policies and standards recommended in the AT Plan.
2. **Set targets for active transportation**. Strengthening the goals of the AT Plan with quantitative targets can help to justify investments and demonstrate success. CBRM may wish to adopt targets regarding active transportation use, safety, and/or infrastructure.
3. **Invest in marketing, education, and behaviour change programs.** These programs play an important role in overcoming the important social barriers and cultural barriers to walking and cycling.
4. **Increase the role of partners in implementation.** CBRM partners may be able to take on a greater role in implementing active transportation initiatives, thus enabling progress on shared priorities (e.g. chronic disease prevention and sustainable transportation).
5. **Secure multi-year funding from other levels of government.** CBRM requires reliable funding from provincial and/or federal partners to implement priority projects and to make sustained progress on active transportation.
6. **Increase the flexibility of municipal funding.** CBRM Council can enable efficient and effective progress on active transportation by allowing small projects to proceed without matching funding, and by allowing funding to carry over from one fiscal year to the next.

Introduction

Active transportation is on the rise across Canada. Cities and towns of all sizes are investing in policies, programs, and infrastructure to promote active transportation (Transport Canada, 2011). Governments at every level are supporting active transportation. And active transportation initiatives are being conducted in partnership with a growing range of organizations – including health authorities, school boards, chambers of commerce, developers, regional transportation organizations, and non-profit organizations – that want to make Canadian communities safer, healthier, and more vibrant.

Cape Breton Regional Municipality (CBRM) is among the municipalities that have articulated a commitment to active transportation. CBRM adopted an active transportation plan in 2008, and has since implemented a wide range of projects to promote active transportation.

Active transportation refers to any form of human-powered transportation – walking, cycling, wheeling, in-line skating, skateboarding, skiing or paddling. Active transportation is something everyone does in some form or another, and active modes[1] are frequently combined with motorized modes of travel (e.g. walking to the bus stop).

This report explores how active transportation can contribute to health and quality of life in Cape Breton Regional Municipality (CBRM). It addresses three sets of questions:

1 How viable are active modes of transportation in CBRM?
2 What are the benefits of active transportation for CBRM?
3 How can CBRM move forward on its commitments to active transportation?

[1] Walking, cycling, in-line skating, skateboarding, skiing, paddling and other non-motorized methods of travel are all referred to as "active modes".

How viable are active modes of transportation in CBRM?

As of 2006, 90% of CBRM commuters usually traveled to work by vehicle. Only 6% walked to work, and 0.2% cycled to work. However, based on trip distances, many more people could easily use active transportation, particularly in Sydney and other population centres.

Trip distances

Over half of CBRM residents could walk or cycle to work in under 25 minutes. The median commuting distance among all CBRM residents is 5.9 km, which corresponds to a cycling trip of 23 minutes or less (Statistics Canada, 2006)[2]. About 15% of CBRM residents live within 2 km of their place of work, less than a 25 minute walk, based on survey results from the active transportation plan[3] (IBI Group, 2008).

Commuting distances are even shorter in Sydney, where 71% of residents live less than 5 km from their place of work, and in other population centres, where 53% live less than 5 km from their place of work (CBRM, 2012b). Distances to other destinations – schools, stores, and leisure activities – are generally shorter than trips to work, and are therefore even more conducive to walking and cycling (DMG, 2008).

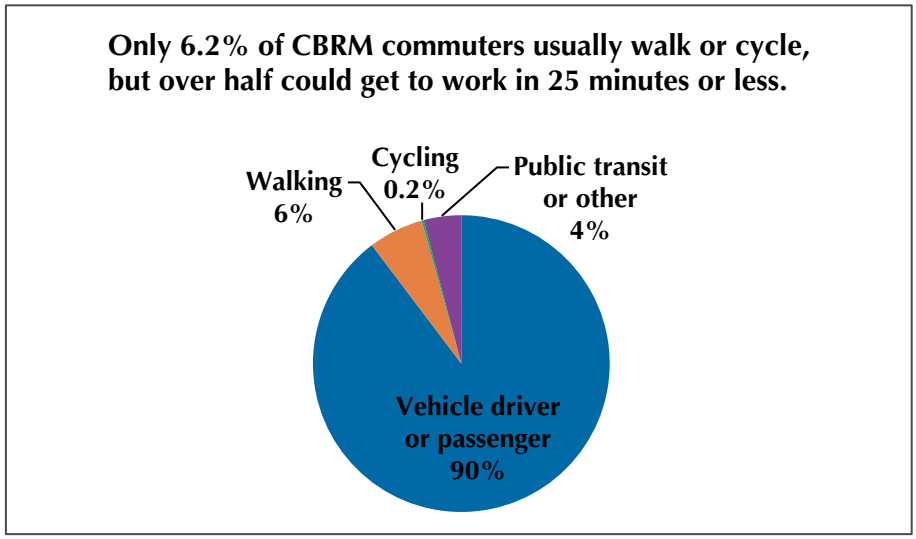


Figure 1 Usual mode of travel to work, 2006 census (Statistics Canada, 2007)

Latent demand for active transportation

In CBRM, there is significant latent demand for active transportation. For example, 67% of CBRM municipal government staff reported that they would like to walk or cycle to work if there was a dedicated bike

[2] Assuming a conservative average cycling speed of 15 km/h.

[3] Assuming a conservative average walking speed of 4.8 km/h.

lane or sidewalk / walking trail that brought them to their workplace in 30 minutes or less (ACAP - Cape Breton, 2010). Similarly, across Canada, 65% of adults agreed that they would use a dedicated bike lane that brought them to work in less than 30 minutes (Canadian Fitness and Lifestyle Research Institute, 2006).

Atlantic Canadians have been interested in walking for many years; in 1998, 88% of Atlantic Canadians reported wanting to walk more often for transportation (Go for Green, 1998). Since 1998, the interest in cycling for transportation has been increasing dramatically. In 2004, 75% of Canadians reported that they would like to cycle more as a mode of transportation (Canadian Fitness and Lifestyle Research Institute, 2006), as compared to 66% in 1998 (Go for Green, 1998).

In particular, CBRM residents identify the importance of cycling facilities in enabling them to cycle more. In a 2008 survey, 43% of CBRM residents stated that more bikeways (lanes, paths, signed routes, multi-use trails) would encourage them to cycle to work. By comparison, only 28% stated that they would not make this trip by bike. Showers, change rooms and secure bike parking were other influential factors in encouraging CBRM residents to cycle to work (IBI Group & CBRM, 2008).

Achievements in other municipalities

Other municipalities have demonstrated that investments in active transportation yield significant increases in active mode shares[4]. These municipalities have shown that even in cold, rainy, and/or low-density communities, people will walk and cycle for transportation if the supporting infrastructure is in place. For example:

- In Whitehorse, where population density is 40 people per square kilometre and the temperature is below freezing 225 days per year, 12% of commuters usually walk or cycle to work.
- In just five years, Moncton almost doubled its cycling mode share, while Thunder Bay increased its mode share by 60%. In both of these municipalities, cycling mode shares are at least five times those of CBRM.
- The District of Saanich's recent Travel Behaviour Survey indicates that "to and from work" bicycle travel has increased from 4% in 1999 to 11% in 2004. "The survey results support the idea that if you build it, they will come. There's a lot of latent demand for cycling that has been brought out by our on and off road improvements" (Transport Canada, 2010).

A comparison of CBRM and other municipalities with similar climates and population densities is shown in Table 1 below. The strategies used to achieve these mode shares are discussed in the, How can CBRM move forward on active transportation? section of this report.

[4] The active mode share is the percentage of trips made using walking, cycling, and other active modes of transportation.

Table 1 Comparison of CBRM and other municipalities

Municipality	Active commuting mode shares (2006)	Population and density	Temperature and/or precipitation	Other notable features
Cape Breton Regional Municipality	6.2% Walking: 6.0% Cycling: 0.2%	Pop. 97,398 Density: 40/km^2	168 days below freezing 1,505 mm/yr	High pop. density in population centres (e.g. Sydney, 719/km^2)
Whitehorse (City)	12.0% Walking: 9.1% Cycling: 2.9%	Pop. 23,276 Density: 56/km^2	225 days below freezing 267 mm/yr	2/3 of pop. lives in an upper area outside of downtown
Peterborough (CMA)	10.2% Walking: 7.8% Cycling: 2.3%	Pop. 118,975 Density: 79/ km^2	172 days below freezing 840 mm/yr	2001-2006 increase in cycling: from 1.8% to 2.3%
Moncton (CMA)	8.6% Walking: 7.6% Cycling: 1.0%	Pop. 126,424 Density: 52.5/km^2	178 days below freezing 1,223 mm/yr	2001-2006 increase in cycling: from 0.6% to 1.0%
Thunder Bay (CMA)	7.5% Walking: 5.9% Cycling: 1.6%	Pop. 121,596 Density: 47.6/km^2	203 days below freezing 711 mm/yr	2001-2006 increase in cycling: from 1.0% to 1.6%

What are the benefits of active transportation for CBRM?

Canadian communities – large and small, including CBRM – are investing in active transportation for social, economic and health reasons. They understand that increasing the use of active transportation improves their residents' health, their communities' quality of life, and their municipality's long-term economic vitality.

Active transportation and health

Transportation is now recognized as a significant public health issue. Increased reliance on cars for everyday transportation has contributed to a reduction in Canadians' physical activity levels, with corresponding health impacts. Increasing the use of active transportation is a powerful and cost-effective public health intervention that shifts the focus to prevention, rather than treatment. The health benefits of active transportation are summarized in the figure below.

Increasing physical activity through active transportation

Active transportation is one of the easiest ways to obtain physical activity, as it is incorporated into daily life. Activities like walking, cycling or using stairs are easier to maintain than facility-dependent activities like going to the gym (Hillsdon & Thorogood, 1996; Dunn, Andersen, & Jakicic, 1998).

The Canadian Physical Activity Guidelines recommend that all adults aged 18 and over obtain 150 minutes of moderate to vigorous physical activity each week, in bouts of at least 10 minutes. This corresponds to 30 minutes of physical activity, 5 days per week. To achieve 30 minutes of physical activity, people need only walk to and from a destination that is about 1 km away, or cycle to and from a destination that is about 3.5 km away.

Physical activity in CBRM

Over half of Cape Breton District Health Authority residents are not active in their leisure time (Government of Nova Scotia, 2012) – and CBRM residents identify being too busy as the number one barrier to participating in physical activity (Ipsos Reid, 2009).

Those who claim that they have no time for physical activity may not realize that *they do not need to set aside time to exercise*. They only need to *replace one car trip a day* with a walking or cycling trip.

Preventing chronic disease

Regular physical activity plays a critical role in preventing chronic disease. If all Canadians met the recommended levels of 150 minutes of physical activity each week, this could prevent about 33% of deaths related to coronary heart disease, 25% of deaths related to stroke, 20% of deaths related to type 2 diabetes, and 20% of deaths related to hypertension (Heart and Stroke Foundation of Canada, 2005). Physical activity also reduces the risk of several types of cancer, including colon cancer and breast cancer (Thune & Furberg, 2001).

Finally, people who use active transportation are at a reduced risk of being obese. A US study found that every additional kilometre walked per day is associated with a 4.8% reduction in the likelihood of obesity, while every additional hour spent in a car is associated with a 6% increase in obesity (Frank, Andresen, & Schmid, 2004).

Chronic disease in CBRM

Cardiovascular disease, diabetes, and other chronic health conditions affect many CBRM residents:

- In 2008, 80% of Cape Breton District Health Authority residents reported suffering from a chronic health condition like arthritis, high blood pressure or back problems.
- Cape Breton District Health Authority residents have the second highest rate of cardiovascular disease in Nova Scotia. Cardiovascular disease is responsible for almost 30% of deaths in Cape Breton each year.
- Chronic disease levels are increasing; for example, between 2001 and 2010, diabetes rates doubled from 6% to over 12%.
- Obesity is a significant issue in Cape Breton; in 2012, 61.9% of Cape Breton District Health Authority residents were overweight, and 27.0% were obese.

(Cape Breton District Health Authority, 2008), (Government of Nova Scotia, 2012)

Saving lives

Physical activity from active transportation reduces the risk of premature death from all causes – thereby saving lives. Based on a meta-analysis of studies, people who receive 150 minutes of physical activity per week benefit from a 14% reduction in mortality rate (Samitz, Egger, & Zwahlen, 2011). And the benefits of physical activity are stronger for people moving from no activity to low activity (Woodcock, Franco, Orsini, & Roberts, 2011).

Saving lives in CBRM

Based on the World Health Organization's Health Economic Assessment Tool, increasing CBRM's active transportation mode share to 12% would reduce mortality rates and save lives each year. A 12% mode share is very achievable, as demonstrated by Whitehorse.

In CBRM, about 4 premature deaths could be prevented *each year* if 12% of commuters walked or cycled to work. Using Transport Canada's value of a life, preventing these deaths yields an annual value of over $10 million.

About 7 premature deaths could be prevented *each year* if 12% of all CBRM residents regularly used active modes for one trip each day, for an annual value of over $20 million.

Appendix A describes the methodology and assumptions used for this calculation. Trip distances and frequencies are estimated conservatively, based on sources including the 2004 National Transportation Survey (Canadian Fitness and Lifestyle Research Institute, 2006) and 2006 Transportation Tomorrow Survey (DMG, 2008).

	CBRM commuters only	All CBRM residents
Regular pedestrians and cyclists – 12% mode share	4,409	8,236
Deaths prevented each year through walking and cycling	4	7
Annual economic value	>$10 million	>$20 million

Reducing the economic burden of physical inactivity

Increasing physical activity through active transportation would yield substantial health care cost savings. A U.S. study found that inactive individuals incur over $600 in additional health care costs per year as compared to active individuals (Pratt, Macera, & Wang, 2000).

The economic burden of physical inactivity in CBRM

The 50,000 inactive residents of CBRM incur about $30 million in health care costs that could be prevented through physical activity (assuming the results of the U.S. Pratt *et al.* study apply to Canada).

Across Canada, physical inactivity is directly associated with $1.6 billion in annual health care costs due to its role in coronary artery disease, stroke, hypertension, colon cancer, breast cancer, type II diabetes and osteoporosis (Katzmarzyk & Janssen, 2004). Physical inactivity costs Canada an additional $3.7 billion in economic productivity loss due to short-disability, long-term disability, and premature death from these same chronic diseases (Katzmarzyk & Janssen, 2004).

There is also growing evidence that active transportation reduces absenteeism. For example, a study of over one thousand Dutch employees found that, on average, people who cycled to work were absent 1 day less than non-cyclists, controlling for other differences. People who cycled at least 5 km to work had even lower rates of absenteeism (Hendriksen, Simons, Garre, & Hildebrandt, 2010).

Improving mental health

Physical activity also has a positive effect on mental health. Physical activity in general – and walking in particular – has been found to reduce the symptoms of depression, anxiety and panic disorders (Paluska & Schwenk, 2000; Heesch, Burton, & Brown, 2010).

Physical activity can also improve mental health in people without specific disorders. Increasing physical activity can improve self-esteem (McAuley, Blissmer, Katula, Duncan, & Mihalko, 2000), improve mood, reduce stress (Fox, 1999), and enhance happiness and satisfaction (Taylor, 2000).

Mental health in CBRM

Cape Breton District Health Authority residents have high levels of mental illness; the mental illness hospitalization rate of 662 per 100,000 people is 75% higher than the Nova Scotia average (Statistics Canada, 2012).

Preventing falls and trauma

Being physically active also reduces the risk of falls and fall-related injuries. This is particularly important for elderly people, who are most likely to be injured from falls. Older adults who are regularly physically active: have better balance; are less likely to fall; have a better chance of avoiding injury if they do fall; and have a better chance of recovering from a fall-related injury (Alberta Centre for Active Living, 2012). Physical activity has been found to reduce the likelihood of a person falling at least once by 14% (Chang et al., 2004), and is associated with a 20-40% reduced risk of hip fracture (Gregg, Pereira, & Caspersen, 2000).

Falls, trauma, and the elderly in CBRM

Individuals 65 and over account for the majority of trauma-related hospitalizations in the Cape Breton District Health Authority; most traumas are the result of falls that occur at home (Cape Breton District Health Authority, 2008).

Retirees' support for active transportation in Nanaimo

In Nanaimo, planners noted that middle to older-aged retirees were particularly active participants in community meetings regarding the active transportation plan. These older adults are concerned about their health, want to remain active, and are therefore vocal supporters and advocates of the Regional District's focus on active transportation. (Regional District of Nanaimo, 2013).

Improving safety for users of all modes of transportation

Investing in active transportation can cost-effectively improve safety for all modes. In municipalities across North America, "before and after" comparisons have shown that adding bike lanes or pedestrian improvements to existing roads significantly improves safety for pedestrians and cyclists – and often for users of all modes. Cities with high bicycling rates generally have a much lower risk of fatal crashes for all road users (Marshall & Garrick, 2011).

Investments in walking and cycling facilities are also extremely cost-effective. For example, in a 2009 evaluation of their investments in municipal projects to improve pedestrian, cycling, and vehicle safety, the Insurance Corporation of British Columbia[5] (ICBC) concluded that

[5] The Insurance Corporation of British Columbia provides funding for municipal transportation projects that improve safety for vehicles, pedestrians, and cyclists.

every dollar invested yielded a $5 to $12 return, as collisions – and insurance premiums – decreased (Sayek & De Leur, 2009).

Safety improvements are particularly important for older pedestrians, who are especially vulnerable to collisions. Older adults are 96% more likely to be killed or injured while walking than other age groups (Ernst, 2011). The high fatality rates are linked to pedestrian infrastructure that ignores the needs of older walkers, and to the frailty of older adults.

Bike lanes and road safety

Bicycle facilities that separate cyclists from motor vehicle traffic are strongly associated with increased levels of cycling (Pucher, Dill & Handy 2010), and reduced collisions and injuries (Reynolds, Harris, Teschke, & Winters, 2009). Based on research in Toronto and Vancouver, cyclists are least likely to be injured on streets with cycle tracks (or separated bike lanes) (Teschke et al., 2012). They are much less likely to be injured on off-street bike paths than on major streets with parked cars. The presence of bike lanes and the absence of parked cars also significantly reduces the risk of cycling injury (Teschke et al., 2012).

In Thunder Bay, the City noted a significant decrease in cyclist collisions on city streets where bike lanes were installed. From 2004 to 2009, there was an average of five cyclist collisions per year on the now-modified active transportation routes. In 2010 and 2011, only one cyclist collision occurred each year on all the roads with bike lanes combined. The average overall number of automobile collisions on these roads has also decreased since the installation of bike lanes (City of Thunder Bay, 2012).

Cycling safety in CBRM

From 2002 to 2006, the most recent years for which collision data is available, CBRM counted between 7 and 16 cyclist-vehicle collisions per year (10.6 per year on average) (CBRM, 2009). In 2006, CBRM had a 0.2% cycling mode share and was home to about 80 bicycle commuters.

The corresponding collision rate of more than 10 collisions per 100 cycling commuters indicates significant room for improvement in CBRM. For example, the City of Burlington, Ontario (pop. 175,000) had a cycling mode share of 0.8% in 2006 and an average of about 5 collisions per 100 cycling commuters from 2001 to 2005 (City of Burlington, 2006).

Reducing air pollution and greenhouse gas emissions

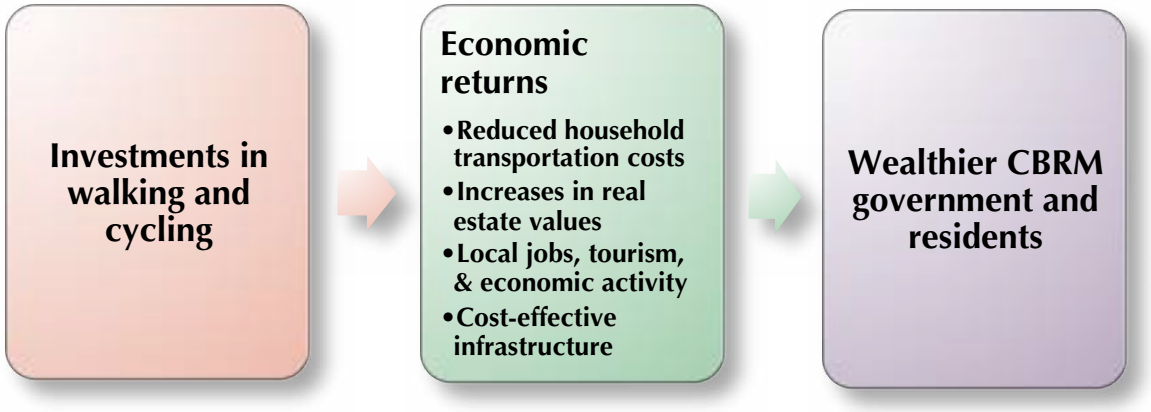
Replacing vehicle trips with walking and cycling trips can reduce air pollution and generate significant health benefits. Particulate matter, nitrogen oxides, carbon monoxide, and ozone are among the air pollutants that stem from vehicles and are hazardous to human health. A study in the Midwestern United States estimated that replacing 50% of automobile round trips of 8 km and shorter with bicycle trips in 11 metropolitan areas would generate net health benefits of $3.5 billion per year due to reductions in fine particulate matter (PM 2.5) and ozone (Grabow et al., 2011).

Investing in active transportation may also be a cost-effective way of reducing greenhouse gas emissions and mitigating climate change. The Intergovernmental Panel on Climate Change suggests that packages of walkways, bikeways and bus/rapid transit could reduce greenhouse gas emissions from light-duty vehicles at a cost of only US$33 per tonne of CO_2 equivalent, as compared to reductions from high-efficiency vehicles at a cost of up to US$110 per tonne of CO_2 equivalent (World Health Organization, 2011). Climate change mitigation will reduce health risks associated with heat waves, extreme weather events, climate-sensitive diseases, and air pollution (US EPA, 2012).

Economic returns of active transportation

In CBRM, the Mayor's Strategy calls for a focus on economic development and public works, including infrastructure improvements, job-creating opportunities, and "the need for a modern approach to get the job done" (Clarke, 2012). The Integrated Community Sustainability Plan calls for ensuring that CBRM continues to be a model of cost-effective operation (Stantec, 2010). Investments in active transportation contribute to an affordable, modern transportation system in CBRM.

Municipalities across North America have documented the economic returns of active transportation that stem from reduced household transportation costs, increases in land value and tourism, local job creation, and cost-effective infrastructure investments. The economic returns of active transportation are summarized in the figure below.



Household transportation costs

Walking and cycling can reduce transportation costs for CBRM households. On average, Canadians spend 14% of household income on transportation. The cost of owning and operating a mid-sized sedan ranges from $9,000 to over $13,000 per year, depending on distance driven (Canadian Automobile Association, 2012). An estimated 10% of Canadians do not have the income to support car ownership (Transport Canada, 2011). For many other Canadians, car ownership and use puts considerable pressure on household budgets. In contrast, the costs of walking and cycling for transportation are minimal.

By replacing vehicle trips with active transportation trips, households can reduce their expenditures on fuel and vehicle maintenance costs. Furthermore, given viable alternative transportation options (e.g. active transportation, public transit, and car-sharing), households may be able to reduce the number of vehicles they own – or avoid vehicle ownership entirely.

Household income and transportation costs in CBRM

The median household income in CBRM is $41,257 (Statistics Canada, 2007). On average, Nova Scotia households own 1.37 light vehicles (Natural Resources Canada, 2011).

If CBRM households spend $12,330 per year on vehicle ownership ($9,000 per vehicle x 1.37 vehicles per household), this equates to 30% of the median household income.

Real estate values

Homes are worth more if they are within walking distance of schools, parks, shopping, and trails. In the United States, homes with above-average "Walk Scores"[6] are sold for $4,000 to $34,000 more than similar but less "walkable" homes (Cortright, 2009). Similarly, proximity to trails and greenways can significantly increase the value of homes (Brown County Planning Commission, 1998).

[6] Walk Score is a number between 0 and 100 that measures the walkability of any address. The Walk Score algorithm awards points based on the distance to amenities in a number of categories.

Walk Score, Bike Score, and the Canadian Multiple Listing Service

Recognizing that walkability affects real estate value, the Canadian Real Estate Association's Multiple Listing Service (MLS) database now publishes a Walk Score for each home listed for sale.

In municipalities where data is available, MLS listings also includes a "Bike Score"[7], as bikeability can also affect home value.

Homes in CBRM have Walk Scores ranging from 0 (halfway between Sydney and North Sydney) to 90 out of 100 (in downtown Sydney).

Investments in active transportation can increase the economic value of properties. In the UK, improvements to the walking environment have been associated with significant increases in sale and rental prices of both residential and commercial properties (University of the West of England, Bristol & Cavill Associates, 2011). These changes are linked to overall increases in the vibrancy of community cores, discussed further in the section, *Active transportation and community vitality*.

Local jobs, tourism, and economic activity

Investments in walking and cycling can create jobs, and generate new tourism, and keep money in the local economy.

- Jobs: Investments in cycling infrastructure generate more jobs per dollar spent than investments in road-only infrastructure. Cycling projects create a total of 11.4 local jobs for each $1 million spent, while road-only projects create 9.6 jobs per $1 million (Garrett-Peltier, 2011).
- Tourism: Cycling networks often draw new tourists to an area. For example, North Carolina's Outer Banks cycling network draws an estimated 680,000 visiting cyclists each year and supports 1,400 jobs in the area (Lawrie, Guenther, Cook, Meletiou, & O'Brien, 2004).
- Local economic activity: Money spent on gasoline flows almost directly to companies out of the province. In contrast, the expenditures of pedestrians and cyclists are more likely to remain in the local economy. Portland, Oregon has a bicycle commuting mode share of 6% and keeps $800 million that would drain out-of-town if local residents drove cars at the same rate as an average U.S. city (Cortright, 2007).

[7] Bike Score is number between 0 and 100 that measures whether an area is good for biking. It is calculated based on bike lanes and trails, hills, destinations and road connectivity, and the number of bike commuters.

Cape Breton and cycling tourism

In 2012, Cape Breton Island was identified as one of the top 10 cycling destinations in the world (Lonely Planet, 2012). CBRM may be able to take advantage of the tourism opportunities that stem from this international recognition.

Cost-effective infrastructure investments

Active transportation infrastructure is inexpensive relative to roads. It costs approximately $1.3 million per kilometre to widen a two-lane arterial road to four lanes. By comparison, it costs $20,000 per kilometre to create a bike lane on an existing road, or $150,000 per kilometre if road widening is also required (TCAT, 2011). In Portland, where the cycle commuting mode share is about 6%, cycling facilities comprised less than 1% of Portland's capital transportation expenditures from 2001 to 2007 (Wallasper, 2010).

Active transportation infrastructure is also cost-effective. According to the Sustainable Development Commission (2011), major cycling infrastructure projects have benefit-cost ratios of about 11:1, considering changes in journey time, travel costs, accidents, noise, and greenhouse gas emissions. By comparison, local highway road schemes have benefit-cost ratios of 4:1 or 5:1.

And specific types of infrastructure have additional benefits. For example, rural highways with paved shoulders are much safer than similar roadways without paved shoulders, and have significantly lower maintenance costs (Centre for Transportation Research and Education, 2001).

Active transportation, quality of life, and community vitality

According to the Integrated Community Sustainability Plan, CBRM is committed to enhancing quality of life for all residents, young and old. CBRM is also committed to encouraging "the development of a vibrant urban core" and to creating "lively communities offering places and events to engage citizens and visitors in the rich culture and creativity of CBRM" (Stantec, 2010). The Active Transportation Plan aims to create a walking and cycling environment that "reaches the entire community, from children to seniors, and the full range of socio-economic circumstances" (IBI Group, 2008).

Across North America, more and more cities are realizing that investing in active transportation is integral to creating a high quality of life and vibrant places. Furthermore, quality of life is integral to attracting and retaining residents and businesses. For example, according to the City of Ottawa, "Walking and cycling helps to create vibrant, liveable neighbourhoods" (City of Ottawa, 2013). According to the Region of Waterloo, "Vibrant urban and rural communities require: a range and

mix of housing options; [and] access by walking, cycling and transit…" (Region of Waterloo, 2010)

According to the Town of Ajax, "Providing Ajax residents with more travel options and, in particular, promoting cycling and walking as a viable alternative to driving, enhances the town's competitiveness in attracting and retaining more economic development in the town" (Town of Ajax & IBI Group, 2010). In Michigan State, leaders from all political backgrounds agree on the importance of vibrant places:

> *"We looked high and low and came to believe with absolute certainty that our future depends on our ability to compete for talent. And as we dug deeper, we found that "talent" (young, college educated, creative people, often entrepreneurs) demands great places. To them, an absolute prerequisite is a vibrant urban center that appeals on an emotional level." – Dan Gilmartin, CEO, Michigan Municipal League.*

The quality of life and community vitality benefits of active transportation are summarized in the figure on the next page.

Mobility and accessibility for all ages, income levels, and abilities

Walking and cycling are critical to the mobility of children and older adults. Approximately 40% of a Canadian's life is spent as a senior and as a child without a driver's license (Transport Canada, 2011). Children, seniors, and other non-drivers depend on walking, cycling, and public transportation to access jobs, stores, and community services. Without safe and affordable alternative transportation options, it becomes difficult for them to maintain a high quality of life and participate fully in society.

Walking and cycling are also critical to the mobility of people living on a low or fixed income. Many Canadian households cannot afford to a own a car (Litman, 2003). They are thus dependent on walking, cycling, and public transit to access employment, educational and recreational opportunities; health and social services; and healthy food. If these alternative transportation options are not available, affordable,

and safe, quality of life for people living on a low-income will be severely compromised; transportation barriers will make it difficult or impossible for these people to participate fully in society (UK Office of the Deputy Prime Minister, Social Exclusion Unit, 2003).

Mobility of children, older adults, and low-income residents in CBRM

CBRM's elderly population is increasing. Today's investments in alternative and active transportation facilities will increase mobility and quality of life for tomorrow's seniors.

CBRM's youth population is decreasing. Providing a range of mobility options for today's youth will increase their quality of life and encourage them to make CBRM their home in the future.

In 2006, 18.4% of all CBRM residents were classified as low-income before tax (12.2% after tax) (Statistics Canada, 2007). Without viable walking, cycling and public transportation options, low-income residents will not be able to participate fully in society.

Active transportation and personal choice in Moncton

The City of Moncton has invested in active transportation to provide residents with *choice*. In the past, there was only one viable transportation option. Now, people have personal choice.

The City of Moncton is still a car-oriented, Atlantic city. Most people own a car and can travel from one end of the community to the other in 15 minutes of less. However, people value the opportunity to walk and cycle, to save money and become more active (City of Moncton, 2013).

Social interaction, community cohesion, and vibrant places

"The car – 'the great connector' – has ultimately… restricted communication and human contact" (Landry, 2012, p. 73). Promoting active transportation can increase social interaction, community cohesion, and safety.

- When people drive less, they interact with neighbours and other community members more (Leyden, 2003).
- Lower levels of automobile use are linked to higher levels of community engagement – and are also linked to overall satisfaction with life (Williamson, 2002).
- Increasing the mode share of walking and cycling has been found to contribute to reduced crime (Liggett, Loukaitou-Sideris, & Iseki, 2001).

The creation of safe and attractive walking and cycling environments also helps to create vibrant places. It encourages people to stay longer and visit more often, and contributes to the "buzz" and quality of place. Investments in active transportation and streetscape improvements can also play a strategic role in community revitalization, as enhanced public spaces and social activity change an area's image. Furthermore, "delightful places" – trails, paths, parks and walkable communities – contribute to people's overall sense of wellbeing (O'Brien, 2006)

Canadians also enjoy walking and cycling more than driving for transportation. Based on Statistics Canada data, commuters who walk or cycle to work are significantly more likely to report enjoying their journey to work than drivers. In fact, 19% of workers who rode their bicycles to work reported that their commute was the most pleasant activity of their day. This was true for just 2% of drivers (Turcotte, 2008). Increasing the use of active transportation can thus increase a municipality's daily quality of life. Finally, there is evidence that happiness is associated with physical and emotional well-being; happy people live longer, recover from illness more quickly, and are more likely to seek out and act on health information (O'Brien, 2006).

Connecting CBRM residents to community cores, to waterfronts, and to each other

Active transportation facilities such as the Sydney Boardwalk can connect residents and visitors alike to CBRM's community cores, pristine environment, and spectacular but under-utilized waterfront (IBI Group, 2008).

Active transportation can also contribute to the sense of community and identity that is so important to CBRM. "Cities that encourage walking, the chance encounter and face to face contact foster creativity, wealth and well-being." (Landry 2012, p. 73)

Local business success

For most businesses, the quality of the walking and cycling environment affects economic success. In a series of interviews with London developers, retailers, and service providers, 85% of respondents identified the quality of the streetscape as important in affecting their ability to attract customers or tenants (Central London Partnership, 2003).

Particularly in urban cores, interventions to improve the walking and cycling environment increase pedestrian activity, and help businesses generate sales. Pedestrians and cyclists have a heightened awareness of store windows and displays, and stop more frequently to shop. In a 2009 study in an urban retail area in Toronto, people who biked and

walked to the area reported spending more money per month than those who drove there (Forkes & Smith Lea, 2010).

Urban core areas also tend to include more independent, locally-owned businesses, where ever dollar spent generates about three times the benefit to the local economy as a dollar spent at a chain retailer (American Indepedendent Business Alliance, 2013). Increases in pedestrian activity – and the associated increases in spending at these businesses – thus helps the local economy.

Helping businesses in the urban core

In Brighton, UK (pop. 156,000), New Road was redesigned as "a place where all transport modes are welcome – but where the pedestrian is king". The pedestrian-friendly environment includes seating and lighting, and has become one of the most popular places to spend time in the City. The project resulted in a 62% increase in pedestrian activity, a 22% increase in cycling activity, and a reduction in traffic collisions. Research participants from the business community unanimously agreed that the scheme had benefited their business (Transport 2000, 2004).

Image from http://www.gehlarchitects.com/

Attracting and retaining businesses

Quality of life factors have an impact on skilled workers' decisions about where to live, and therefore also affect business location decisions. Quality of life is most important for "footloose" firms and industries, where financial performance is relatively independent of location – but highly dependent on employees (Love & Crompton, 1999). For example, quality of life consistently ranks near the top of locational criteria for high–tech firms and research and development labs (Salvesen & Renski, 2003). When key decision makers relocate with a firm, quality of life factors are particularly important (Love & Crompton, 1999). Small businesses also put higher emphasis on quality of life than large firms (Salvesen & Renski, 2003).

It is no coincidence that walkable metropolitan areas have higher levels of highly educated people, more high-tech companies, and higher incomes (Florida, 2010). Investments in quality of life – including walkability and bikeability – are now viewed as a viable economic development strategy (Salvesen & Renski, 2003).

Quality of life and business location in Atlantic Canada

In a recent survey of Newfoundland and Labrador businesses, respondents indicated that amenities and quality of life make a difference in retaining skilled workers (and that retention is easier than attraction). Many chose to locate businesses in Newfoundland and Labrador because they feel like "home". Respondents also lauded the regions for their commitment to developing and encouraging outdoor activities, including easy access to scenic landscapes (Greenwood & Pike, 2011).

Attracting and retaining skilled workers

People with good skills have choices about where they want to live and work. Two-thirds of college-educated young people report that they will make the decision of where to live first, and will then look for a job within that area (Yankelovitch, 2006).

Market analysis shows that today's young professionals want to live in neighborhoods with walkable downtowns and a variety of transportation options (Layton, Pruitt, & Cekola, 2011). In the Greater Toronto Area and Greater Vancouver Area, residents of both city and suburbs report preferring a pedestrian/transit-oriented neighbourhood (Urban Design 4 Health, 2012). Six in ten Americans say they would prefer to live in walkable neighbourhoods, in both cities and suburbs (Florida, 2010). Furthermore, more and more young people in Canada and the United States are choosing not to drive. In 1983, over 87% of people aged 16 to 19 had a driver's license. In 2010, this number dropped to under 70% (Sivak & Schoettle, 2012).

The importance of attracting and retaining skilled workers in CBRM

CBRM is struggling to retain and attract young, well-educated residents. CBRM communities have experienced dramatic population decline, primarily due to net out-migration (Whalley, 2008). The population of CBRM is now barely 80% of the area's 1961 peak population (Stantec, 2010), and population is continuing to decrease.

The decline is particularly dramatic in the younger age groups. From 1996 to 2006, the under 55 population decreased by approximately 20% (Whalley, 2008). Furthermore, a significantly smaller share of CBRM's adult population has a university degree than the national or provincial average (Whalley, 2008).

How can CBRM move forward on active transportation?

CBRM's commitment to active transportation

CBRM has articulated a commitment to active transportation. In 2008, Council adopted the Active Transportation Plan, with the vision:

> *The Active Transportation Plan will improve the health of the citizens of CBRM by creating opportunities to connect this 'community of communities' through walking, cycling and other human powered modes in a manner that will create economic, social and environmental benefits.* (IBI Group, 2008)

Furthermore, the goals of CBRM's guiding strategies and plans cannot be achieved without enabling active transportation.

The Integrated Community Sustainability Plan, adopted in 2010, calls for CBRM and its core communities to be "friendly to an aging community" and "appealing to young people", with a sustainable pattern of land development and vibrant urban cores (Stantec, 2010).

According to the Mayor's Strategy, *Shaping our Future in the CBRM*,

> *Active communities are vital to the overall health of a community. The CBRM has the benefit of beautiful physical surroundings, creating an exceptional backdrop for active living.*

The Mayor's Strategy identifies the need to develop a walking and cycling trail system; and integrate CBRM communities through the development of dynamic trails. Finally, the Mayor's Strategy calls for building "a modern community that leads", and "pursuing opportunities that will advance our region" (Clarke, 2012).

Moving forward on active transportation in CBRM

CBRM has made progress on implementing the Active Transportation Plan (AT Plan), and a number of new facilities are being used for walking, cycling, and recreation. For example:

- Three major infrastructure projects identified in the AT Plan have been completed: the Westmount Walking Loop, the Greenlink trail network, and the Whitney Pier Community Heritage Trail;
- Benches and bike racks have been installed throughout the Municipality, and bike racks have been installed on municipal buses;
- CBRM has provided financial and technical support to the Active and Safe Routes to School Program, and has produced a series of television ads on walking and cycling safety;
- The Municipality partners with Velo Cape Breton to promote annual Bike Week events and deliver Can BIKE courses; and
- CBRM has undertaken design or feasibility studies for projects including the Grand Lake Road Multi Use Path, the George

> Street bike lanes, the Renwick Brook pedestrian tunnel, the Sydney-Westmount pedestrian shuttle, the SPAR bikeway, and the Sydney River Multi Use Path. (CBRM, 2012a)

However, CBRM has not yet institutionalized the commitment to active transportation, and many aspects of the plan have not yet been implemented. Active modes are not yet safe, convenient and enjoyable enough to attract large numbers of users.

How have municipalities such as Whitehorse, Moncton, and Peterborough made walking and cycling viable – and popular – modes of transportation (Table 1)? How do these lessons apply to CBRM? Based on a literature review, telephone interviews with select municipalities (methodology described in Appendix A), and conversations with CBRM stakeholders, we suggest the following actions to move forward on active transportation in CBRM:

1. Institutionalize active transportation within municipal policies and standards.
2. Set targets for active transportation.
3. Invest in education, promotion, and behaviour change programs.
4. Increase the role of partners in implementation.
5. Secure multi-year funding from other levels of government.
6. Increase the flexibility of municipal funding.

These actions are described in greater detail below, with examples of how they have been used by other municipalities.

1. Institutionalize active transportation within municipal policies and standards

Including active transportation in municipal policy documents helps to institutionalize the municipal commitment to active transportation and drive change on the ground. Many municipalities have integrated active transportation into community and regional sustainability and/or master plans, residential and commercial development standards, and plans specifically for active transportation. They have also integrated active transportation into roadway design standards, so all road reconstruction projects include active transportation.

Cementing active transportation in municipal policies makes active transportation-friendly options the default options. It also reinforces how the goals and objectives of active transportation connect to other municipal priorities. Finally, it increases government accountability for action on active transportation, and increases the likelihood of funding for infrastructure and programs.

CBRM should begin by adopting the formal policies and standards recommended in the AT Plan. These policies and standards address land use and transportation infrastructure, including the following:

- Pedestrian infrastructure planning, design, and maintenance;
- Bikeway planning, design and maintenance; and

- Site design standards.

The box on the next page provides examples of how municipalities have included active transportation in policy documents and standards.

Institutionalize active transportation within municipal policy

The **City of Charlottetown** has shown support for active transportation by changing cycling and bike lane bylaws. This has protected newly created bike lanes from being removed due to protests from critics. Additionally, active transportation was included in the 2010 Community Sustainability Plan, which has increased awareness among the community and reinforced the idea of cycling and walking as part of Charlottetown's future.

The **City of Moncton** developed an Active Transportation Plan in 2002 to guide the implementation of initiatives in the city and raise awareness. Since then, active transportation has been included in the City of Moncton Sustainability Plan, and will be included in the future Regional Transportation Master Plan. Subdivision standards accommodate walking and cycling, and all buildings are required to develop corridors for walking and cycling. The new Municipal Plan, which will be published in the spring, will center on active living.

In the **City of Thunder Bay,** all roads that are reconstructed are built to active transportation route standards. Thunder Bay recently approved urban design guidelines that support active transportation, and the new Official Plan will include active transportation.

The **City of Peterborough** is developing a complete streets policy. Their sidewalk policy and process for reconstructing roads also ensures that cycling and walking infrastructure are consistently developed. Fewer staff members are needed because the City's policies are so supportive and the development of active transportation facilities is almost automatic.

2. Set targets for active transportation

A central goal of CBRM's AT Plan is, "to get more people to walk, run, or roll as part of their daily routine, and for some, enable them to make active transportation their primary travel mode" (IBI Group, 2008). However, the AT Plan does not recommend any specific targets.

Strengthening the goals of the AT Plan with quantitative targets can help to justify investments and demonstrate success. If possible, progress on objectives should be publicized, to further increase municipal commitment and public recognition of achievements.

CBRM may wish to adopt targets regarding active transportation use, safety, and / or infrastructure, as illustrated in Table 2. Sample targets

adopted by other municipalities in each of these areas are also included in Table 2.

CBRM will also need mechanisms to track progress in each of these areas. CBRM already uses annual intersection counts to collect data on the volume of pedestrians and cyclists. CBRM may also be able to track progress on active commuting mode shares using the results of the National Household Survey (that replaces the long-form census). To track progress on active transportation collisions and injuries, CBRM will need to regain access to police collision data.

CBRM may wish to adopt ambitious but achievable targets such as:

1 To double the number of active commuters between 2011 and 2021; and
2 To reduce the number of collisions per active commuter by 50%.

Table 2 Target areas, indicators, tracking mechanisms and sample targets

Target areas	Indicators and tracking mechanisms	Sample targets
Active transportation use	• Volumes of pedestrians and cyclists (intersection counts) • Commuting mode shares (National Household Survey) • Reported use of walking and cycling (other surveys)	Calgary: increase the downtown walking and cycling mode shares to 11% and 4% by 2020 (City of Calgary 2009). Halifax: double the number of person-trips by Active Transportation modes within 20-years (Halifax Regional Municipality, 2006) Chicago: increase bicycle use by 2015 so that 5% of all trips less than 8 km are by bicycle (City of Chicago, 2006)
Active transportation safety	• Collisions and injuries (police collision data) • Perceived safety (surveys)	Chicago: reduce the number of bicycle injuries by 20% from current levels by 2015 (City of Chicago 2006).
Active transportation infrastructure	• Km of trails, sidewalks, bike lanes, etc. • Number of bike racks installed, crosswalks upgraded, etc.	Montreal: double the bike network in 7 years (Ville de Montreal, 2005).

3. Invest in marketing, education, and behaviour change programs

Marketing, education and behaviour change programs are critical elements of transportation initiatives. While infrastructure interventions generally receive the most attention, many barriers to active transportation are rooted in people's attitudes and habits (Lavizzo-Mourey & McGinnis, 2003). Marketing, education, and behaviour change programs play an important role in overcoming the social and cultural barriers to walking and cycling (Pucher, Dill, & Handy, 2010).

These programs are particularly important in the early stages of implementation, as they can build public awareness of active transportation, increase public support, generate "brand recognition", and tackle problematic social norms. Useful tools may include: advertising and social marketing campaigns; maps, brochures and signage; special events; training courses; and active commuting programs.

Marketing, education, and behaviour change programs are extremely cost-effective (Ashcroft *et al.,* 2011), and many municipalities report that they have led to increases in mode share – even when they precede widespread construction of active transportation facilities. It may be helpful to dedicate a percentage of annual funding to these types of programs and events. In Thunder Bay, approximately one quarter of the annual active transportation budget is allocated to education and marketing. Health authorities, educational institutions, and community-based organizations may be able to share the cost of developing and implementing these programs.

The CBRM Active Transportation Plan recommends developing "AT-supportive programs aimed at shifting travel behaviours and encouraging more people to walk, cycle, and take transit" (IBI Group, 2008). However, CBRM has not yet developed mass marketing, education, or behaviour change campaigns to address social norms and get CBRM residents walking and cycling.

The box on the next page provides examples of how municipalities have invested time and money into marketing, education, and special events.

Invest in marketing, education, and behaviour change programs

In the **City of Thunder Bay**, there was a significant social stigma attached to cycling for transportation. Many drivers labelled cyclists as miscreants, unemployed, drunks, etc. The "You know me, I ride a bike" campaign, led by the Thunder Bay Health Unit, had a profound impact on public perceptions (City of Thunder Bay, 2013).

The **City of Peterborough's** month-long commuter challenge in May has been running since 2004. Workplaces compete for the coveted Travel Wise Award in different size categories, based on kilometres of car travel avoided and kilograms of CO_2 saved. In 2006, there were 60 companies participating in the program, entitled "Shifting Gears", and in 2012 there were over 100. Follow-up surveys indicate that Shifting Gears results in long-term behaviour change, as participants enjoy their new modes of travel to work (City of Peterborough, 2013).

The **City of Moncton** insists that their investments in public awareness are closely linked to their active transportation successes. After developing an active transportation plan in 2002, the City spent four years focusing solely on education and promotion. Between 2001 and 2006, cycling commuting rates increased from 0.6% to 1.0%.

Education and promotion also proved particularly important in 2009, when the city began implementing on-road cycling projects that reduced car lanes.

Advocates from cycling groups, walking groups, seniors groups, and youth groups were enlisted as partners, and have played an important role in "selling" active transportation. The City continues to spend $50,000-75,000 annually on education and promotion. Tools include:

- Mass advertising campaigns
- Safe cycling courses and workshops
- Educational brochures re. infrastructure and safety
- Direct mailings re. specific projects
- Q&A pages on the city website
- Promotion at farmers markets and community events
- Active and safe routes to school programs
- Route maps and signage (City of Moncton, 2013).

4. Increase the role of partners in implementation

Since 2006, CBRM has made impressive efforts to engage a wide range of partners in its active transportation activities. For example, the Active Transportation Committee includes representatives of organizations including the District Health Authority, Cape Breton Victoria Regional School Board, Cape Breton University, Velo Cape Breton, ACAP Cape Breton, and provincial departments of health and transportation. However, some of these partners may be able to play a greater role in implementing active transportation initiatives, thus enabling progress on shared priorities.

Increasing the role of partners in implementation involves identifying and building on shared priorities. For example, given the health benefits of active transportation, the District Health Authority could consider taking a greater leadership role in implementing projects, programs, and policies that support active transportation. By investing in active transportation, the Health Authority would also be investing in chronic disease prevention and reducing the strain on the healthcare system. In Thunder Bay and Haliburton County, health authorities have played key roles in designing, delivering and / or funding active transportation initiatives (as described in the box on the next page.)

Similarly, Nova Scotia Transportation and Infrastructure Renewal may be able to increase its support for walking, cycling and transit in CBRM to achieve the goals of its Sustainable Transportation Strategy (2008). To support walking in CBRM, the Province could take on additional responsibility for sidewalk repair and maintenance on the 100 kilometres of provincial roads (the costs of which are now borne by CBRM). The Province could also provide funding for the operation of CBRM's transit system (CBRM, 2012b).

The Cape Breton Victoria Regional School Board and provincial health department may also be well positioned to provide additional support to CBRM on active transportation. These organizations may be able to contribute staff time and resources to active transportation initiative that advance their own objectives – and they may be able to reform their policies and practices to better promote active transportation.

Increase the role of partners in implementation

In **Thunder Bay**, two councillors put forward a motion in 2012 to get rid of all bike lanes and have cyclists ride on sidewalks. The Health Unit played a leadership role in changing the conversation by:

- publishing a media release stating that sidewalks are dangerous for cycling, based on City collision data.
- launching the "You know me, I ride a bike" marketing campaign, with radio, newspaper and billboard advertisements.

Very quickly, the discussion in Council shifted to bike lanes and cycling safety (City of Thunder Bay, 2013).

5. Secure multi-year funding from other levels of government

CBRM requires reliable funding from provincial and/or federal partners to implement priority projects and to make sustained progress on active transportation.

CBRM's AT Plan calls for a budget of $1 million per year. One third of this funding is to be provided by the Municipality, and two-thirds are to by provided by the provincial and federal government. CBRM's Council has already demonstrated its commitment by dedicating $333,000 in annual funding to implementation of the active transportation plan. The annual active transportation budget of $333,000 has enabled CBRM to implement popular, high-profile projects including the Whitney Pier trail and the Greenlink Trail. However, this funding can only be spent on projects where two-thirds of the costs are covered by provincial and federal contributions.

Securing provincial and federal funding for implementation of the AT Plan has been an ongoing challenge. Figures provided by CBRM staff indicate that for the first four years of AT Plan implementation (including 2012-2013) approximately $2.4 million has been spent, with a little less than a third coming from the Municipality. Although significant progress is obviously being made, the $600,000 a year that is being spent is significantly less than the anticipated $1 million.

Furthermore, CBRM staff have spent countless hours writing proposals to secure this funding from various provincial and federal programs – none of which are specifically devoted to active transportation. Projects are selected based on their alignment with funding requirements, rather than based on their importance to CBRM. When proposals are successful, timeframes are often very tight (less than one year), and CBRM must scramble to complete projects before funding expires. This funding situation severely limits CBRM's ability to implement the AT Plan efficiently and effectively.

To demonstrate its commitment to active transportation, the Province of Nova Scotia could:

1. Establish a dedicated source of funding for active transportation.
2. Create multi-year funding agreements to support active transportation in municipalities such as CBRM (CBRM, 2012b).

6. Increase the flexibility of municipal funding

CBRM Council can enable progress on active transportation by increasing the flexibility surrounding the annual budget of $333,000. This could entail:

1. Allowing small projects (e.g. up to $50,000 in value) to proceed without matching provincial and/or federal funding; and
2. Allowing active transportation funding to carry over from one fiscal year to the next.

This change to the funding situation would increase CBRM staff's ability to implement projects and programs efficiently and effectively. It would also help to ensure continuity of core active transportation projects, programs, and partnerships. Finally, it will reinforce the message that the municipal government is committed to creating safe and active communities in CBRM.

The box below expands on the importance of reliable funding for active transportation.

Reliable funding for active transportation

What would happen if CBRM cut off active transportation funding for a full year?

If CBRM were to cut off active transportation funding for a full year, all projects would need to be put on hold. CBRM would not be able to maintain marketing and education programs, including programs developed with partners. CBRM would struggle to rebuild these valuable partnerships once funding for active transportation was restored.

How has steady municipal funding benefited other municipalities?

The **City of Thunder Bay's** active transportation program has an annual budget of $180,000 for marketing and education programs, for the development of bike lanes, and for the salary of an Active Transportation Coordinator. (The Parks Department provides funding for multi-use trails, and Engineering provides funding for sidewalks and road reconstruction to the standards set out in the active transportation plan).

In some years, the active transportation program has had a much larger annual budget, thanks to successful grant applications and funding from the provincial and federal governments. In other years, very little additional funding has been available. In all years, the guaranteed base budget has enabled Thunder Bay to maintain marketing and education programs and continue progress on bike lanes. Council is now considering a ~40% increase in the annual active transportation budget, to $250,000 (City of Thunder Bay, 2013).

Conclusion

> *"Cities of every size in ever location face periods of deep transition... This challenges cities to think about their opportunities and problems with ingenuity and to review their assets – or lack of them. Cities have had to ask themselves: who am I; where do I go next…? What are the conditions my city can create for people and institutions to think, plan and act with imagination?" (Landry, 2012)*

Like many other municipalities in Canada, CBRM is facing a transition period. CBRM has outlined a new identity that involves transportation choices, vibrant communities and a high quality of life for all residents, young and old. As part of the transition to a "community that leads" (Clarke, 2012), CBRM has committed to investing in active communities and active transportation. According to the AT Plan, this involves "engraining active transportation into all aspects of community building" (IBI Group, 2008).

The active transportation potential in CBRM

There is significant potential to increase the use of active transportation in CBRM. Over half of CBRM commuters could easily cycle to work, and surveys indicate that most residents are interested in cycling more.

The benefit of active transportation for CBRM

Increasing the use of active transportation would improve CBRM residents' health, preventing chronic disease, premature death, and the associated costs. Investing in active transportation is aligned with CBRM's goal of cost-effective operations, focusing on facilities and services that address emerging needs and serve a wide range of age cohorts. Finally, increasing the use of active transportation would improve quality of life and economic vitality in CBRM – both of which are integral to the Municipality's long-term sustainability.

Next steps for CBRM

CBRM has already articulated a commitment to active transportation. In 2008, Council adopted the Active Transportation Plan, and CBRM has made commendable progress on implementing the AT Plan. Moving forward on active transportation involves the following next steps:

1. Institutionalize active transportation within municipal policies and standards.
2. Set targets for active transportation.
3. Invest in education, promotion, and behaviour change programs.
4. Increase the role of partners in implementation.
5. Secure multi-year funding from other levels of government.
6. Increase the flexibility of municipal funding.

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Appendix A. Methodology

Literature review and telephone interviews

We conducted a review of academic and professional literature on active transportation, focusing on the benefits associated with walkable and bikeable communities, strategies that can enable active transportation in places like CBRM, and barriers and motivators to implementing programs.

The literature review also identified municipalities in Canada that are similar to CBRM (in land use, in demographics, in climate, and/or in culture), and that have demonstrated leadership and/or notable progress in active transportation. From this research, six of the most relevant municipalities were chosen for telephone interviews with program administrators.

We then conducted telephone interviews with senior staff from five municipalities to explore active transportation strategies and results. The municipalities interviewed were: Thunder Bay, Peterborough, Moncton, Charlottetown, and Nanaimo. We also tried to organize an interview with Whitehorse, but were unsuccessful. However, examples of active transportation elements in Whitehorse are still included in this report based on information gathered from our literature review.

Interviews generally lasted 45 to 60 minutes, and used semi-structured interview techniques to ensure that all relevant topics were addressed, while focusing on the issues most relevant to each interviewee. Interviewees were provided with an interview guide ahead of time, with the following list of questions:

- What were the reasons for promoting active transportation? To what extent was there support from the top and buy-in across the organization?
- What were the (real and perceived) barriers to active transportation? What strategies were used to overcome these barriers?
- Who is involved in implementation? What sources of funding are being used for implementation?
- What methods do you use to assess the results? What were the initial mode shares for walking and cycling? What changes have you seen?
- Are you doing any assessment of health benefits, economic benefits, and/or social benefits linked to active transportation?
- What do you see as the most important next steps for increasing walking and cycling?
- Do you have any advice for CBRM and other municipalities seeking to increase the use of active transportation?

The recommendations for CBRM draw on information from both the literature review and phone interviews.

Calculating deaths prevented in CBRM

We use the World Health Organization's Health Economic Assessment Tool to estimate how increasing CBRM's active transportation mode share to 12% would reduce mortality rates and save lives each year. A 12% mode share is very achievable, as demonstrated by Whitehorse.

The World Health Organization Health Economic Assessment Tools (HEAT for Walking and HEAT for Cycling) evaluate the reduction in population-level mortality from a given level of walking and cycling. The HEAT uses data from published studies on the relative risk of death from all causes among regular pedestrians or cyclists, compared to people who do not cycle or walk regularly. Based on these "relative risk estimates", the tool calculates the reduction in expected deaths in the population that cycle or walk at this level. HEAT for cycling is designed for adult populations aged 20-64. HEAT for walking is designed for adult populations aged approximately 20-74 years (WHO, n.d.).

The WHO HEAT assessments require an estimate of how many people are walking or cycling. We estimate these numbers using the following methodologies:

- Number of commuters walking and cycling: When including commuters alone, we apply Whitehorse's walking and cycling mode shares of 9.1% and 2.9%, respectively, to CBRM's total of 36,740 commuters from the 2006 Census ((Statistics Canada, 2007).
- Total number of residents walking and cycling: When including "all" CBRM residents, we apply Whitehorse's walking mode share of 9.1% to CBRM's total population aged 20-74 of 71,020. We apply Whitehorse's cycling mode share of 2.9% to CBRM's total population aged 20-64 of 61,100 ((Statistics Canada, 2007).

The WHO HEAT assessments also require an estimate of the average annual duration or distance of walking or cycling. Table 3 and Table 4 identify the data and data sources used for the HEAT calculations for walking and cycling. Finally, the WHO HEAT assessments require the mortality rate for Canadians aged 20-74 to estimate the number of deaths that would have occurred in the absence of walking or cycling. We calculate the mortality rate at 383 deaths per 100,000, using Statistics Canada (2008) data.

To estimate the economic value of the deaths prevented by active transportation in Toronto, we use the Value of a Statistical Life of $4.05 million from a report for Transport Canada (Sawyer, Stiebert, & Welburn, 2007). This value of a statistical life uses "willingness to pay" (WTP) methodology, which reflects how much a representative sample of the population (potential victims) would be willing to pay (in monetary terms) to avoid the risk of sudden death.

Table 3 Average annual duration of walking

	Walking – to work	Walking – all trips	Sources
Average distance per one-way trip	1.5 km	1.0 km	National Transportation Survey 2004 (Canadian Fitness and Lifestyle Research Institute, 2006)
Trip speed	4.8 km/h	4.8 km/h	Moderate speed suggested by WHO HEAT
Trips per day	2	2.5	Transportation Tomorrow Survey 2006 (Data Management Group, University of Toronto Civil Engineering, 2008)
Time per person per day (min.)	18.75	12.5	Distance per trip x trips per day / trip speed
Days per year	250	300	Estimated based on travel surveys
Average annual duration (min.)	9,375	9,375	Time per day x days per year

Table 4 Average annual duration of cycling

	Cycling – to work	Cycling – all trips	Sources
Average distance per one-way trip	5 km	4 km	National Transportation Survey 2004 (Canadian Fitness and Lifestyle Research Institute, 2006)
Trip speed	15 km/h	15 km/h	Average of speed suggested by WHO HEAT (14 km/h) and Google Maps (16 km/h)
Trips per day	2	2.5	Transportation Tomorrow Survey 2006 (Data Management Group, University of Toronto Civil Engineering, 2008)
Time per person per day (min.)	40	40	Distance per trip x trips per day / trip speed
Days per year	145	174	City of Calgary Bicycle Commuting Survey (City of Calgary, 2007)
Average annual duration (min.)	5,800	6,960	Time per day x days per year

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