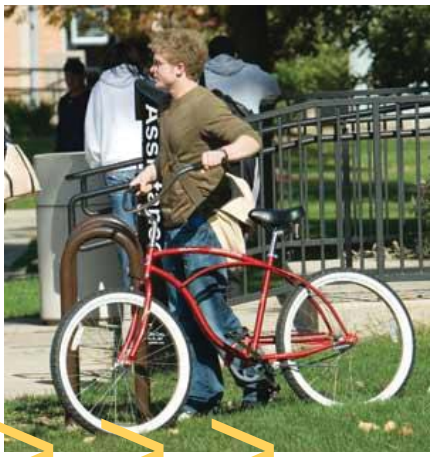

HALIFAX TRANSPORTATION DEMAND MANAGEMENT (TDM) FUNCTIONAL PLAN

Halifax Regional Municipality, NS

Job no.1096

17 June 2010

Prepared by Boulevard Transportation Group Ltd.

EXECUTIVE SUMMARY

The Transportation Demand Management (TDM) Functional Plan, part of a broader Halifax Regional Municipality transportation plan, contributes to establishing an efficient, sustainable transportation network through the development of policy, programs, and services which intend to reduce single occupant vehicles (SOVs) and the negative impacts associated with automobile use. It is intended to focus on increasing the use of sustainable transportation modes rather than increasing roadway capacity.

The following goals outline the framework within which the TDM Functional Plan was developed:

1. Identify and implement opportunities and programs to reduce transportation energy consumption and emissions.
2. Maximize the availability, appeal and use of fiscally sustainable, environmentally responsible and integrated transportation modes.
3. Enhance and support the use of alternatives to single occupant vehicle trips.
4. Ensure land use and urban design support fiscally and environmentally sustainable transportation.
5. Ensure that TDM is disseminated to both HRM staff and residents.

Introduction to TDM

Transportation demand management (TDM) is a set of strategic initiatives geared toward improving the efficiency of the transportation network, encouraging alternatives to the single occupant vehicle trip and encouraging behavioural change.

There are many benefits associated with the development of a TDM program, including: improved land use efficiency; reduction in pollutants in the environment; reduction in traffic congestion; and decrease in public investment in infrastructure, among others. Such benefits have a positive impact upon the entire community, improving quality of life for residents and visitors.

Travel behaviour is influenced at a local level through TDM programs, but support exists at a national level through organizations such as the Association for Commuter Transportation of Canada, the Transportation Association of Canada and federally through Transport Canada. Research, funding, and networking are all available to TDM practitioners and to various government bodies and non-governmental organizations through these groups, providing support to the development of sustainable transportation initiatives and policies throughout Canada. This support provides a foundation for the development of TDM programs within HRM and throughout Canada.

TDM Within HRM

Transportation demand management within HRM is a critical component of many projects and plans. The Regional Plan sets out the need for a TDM Functional Plan as well as its importance within a sustainable transportation system. It has positive environmental impacts as a decrease in the use of single occupant vehicle trips will reduce the levels of greenhouse gases emitted as well as the pollution resulting from road building and maintenance.

TDM has an impact upon how parking regulations are developed and on the demand for parking spaces. TDM looks at how to change travel behaviour through the promotion of transit as a preferred commuting mode by encouraging active transportation and by implementing commuter options programs.

TDM measures are part of the Regional Plan objectives of investing in sustainable transportation over twenty-five (25) years. The TDM Functional Plan will provide the basis to encourage the change in travel behaviour required to support HRM's objectives.

Recommended Strategies

The TDM Functional Plan set out to create specific, action-oriented recommendations and strategies for HRM's specialized needs. After detailed analysis of the municipalities current conditions the following recommendations were given.

Section	Recommended Strategy	Description
5.1.1	**Ridesharing**	**AGRESSIVELY EXPAND BOTH PUBLIC & PRIVATE RIDESHARING THROUGHOUT HRM** • Undertake a coordinated region-wide assessment of the potential rideshare market in HRM • Elevate marketing of ridesharing programs on campuses of universities and colleges • Investigate strategies to remove barriers for increased ridesharing • Elevate importance, knowledge and awareness of ridesharing with transit agencies and other stakeholders
5.1.2	**Transit Pass Program**	**ELEVATE IMPORTANCE, KNOWLEDGE & AWARENESS OF TRANSIT PASS PROGRAMS WITH MAJOR STAKEHOLDERS** • Incorporate mandatory policy for transit facilities and transit pass programs in the workplace

5.1.3	**Carshare Programs**	**UNDERTAKE A NEEDS ASSESSMENT & DEVELOP A LONG RANGE PLAN** • Use results from needs assessment to develop a long range plan for carshare service in conjunction with HRM policies • Work to include and support carshare programs within HRM's TDM policies • Reserve public parking for carshare users • Update parking bylaw requirements, terms and variances • Re-evaluate parking variances with consideration for carshare programs
5.1.4	**Park & Ride**	**UNDERTAKE A NEEDS ASSESSMENT & DEVELOP A LONG RANGE PLAN** • • Review future park & ride locations based on the following variables: location; function and lot capacity • Accelerate the development of infrastructure needed to support regional park & ride activities • Develop guidelines and standards for multi-modal infrastructure that supports park & ride such as pedestrian walkways, bicycle facilities, park & ride lots, crosswalks, and transit stops
5.1.5	**Priority Parking**	**ADDRESS PRIORTY PARKING IN CONTEXT WITH PRICING & SUPPLY** • • Reserve the best parking spaces for vehicles that support TDM initiatives and sustainable travel characteristics • Create TDM incentives using parking as a tool • Meet with major employers about reserving private parking spaces for vehicles that exhibit sustainable travel characteristics

5.2.2	**Reserved Lane Program**	**UNDERTAKE A REGION-WIDE ASSESSMENT OF THE POTENTIAL FOR RESERVED LANE PROGRAMS** • Assess feasibility of HOV lanes • Improve user information to explain regulations, function and benefit of reserved lanes • Review existing conditions of reserved lane systems, such as bus lanes and bicycle lanes periodically
5.3	**Commuter Trip Reduction Program**	**IMPROVE USER INFORMATION & MARKETING** • Market strategy to major employers in area
6.0	**Tax Reform, Information, Marketing and Outreach**	**MARKET TDM USING OUTREACH TOOLS & PROGRAMS** • Explore pricing mechanisms to establish/increase the costs for parking • Address parking/policy/zoning/pricing connection in the context of external costs • Initiate a region-wide effort to implement adopted TDM policies, ensure regional coordination and consistency and increase public awareness of sustainable transportation • Formally integrate TDM into all transportation planning and programming processes • Improve TDM vision and knowledge and continue efforts to increase regional coordination • Provide aggressive public education, marketing and advertising aimed at changing travel attitudes and behaviours • Develop a single, integrated customer-information hub for all TDM services

7.1	**Settlement and Land Use Patterns**	**DEVELOP A LONG RANGE PLAN THAT CONSIDERS A COMPREHENSIVE STRATEGY FOR SETTLEMENT AND LAND USE** • Create a holistic strategy with TDM initiatives of HRM and major development and infrastructure systems in the region
7.2	**Land Use Bylaw Requirements**	**EVALUATE & UPDATE BYLAWS** • Update and develop new bylaws that encourage TDM initiatives
7.3	**Development Process**	**INCORPORATE LAND USE WITH REGIONAL DEMAND MANAGEMENT** • Develop new directions for comprehensive planning, land use and site planning to emphasize TDM strategies, easy access to transportation services and reduced SOV travel
8.0	**Single Occupant Vehicle Trip Disincentives**	**DEVELOP DISINCENTIVES FOR SOVS** • Raise acceptable congestion in exchange for developer contributions to TDM programs • Develop financial disincentives to driving alone and incentives for using sustainable modes • Investigate pricing tools that more accurately reflect the true costs of transportation • Promote incentives for employers who undertake TDM activities

ACKNOWLEDGEMENTS

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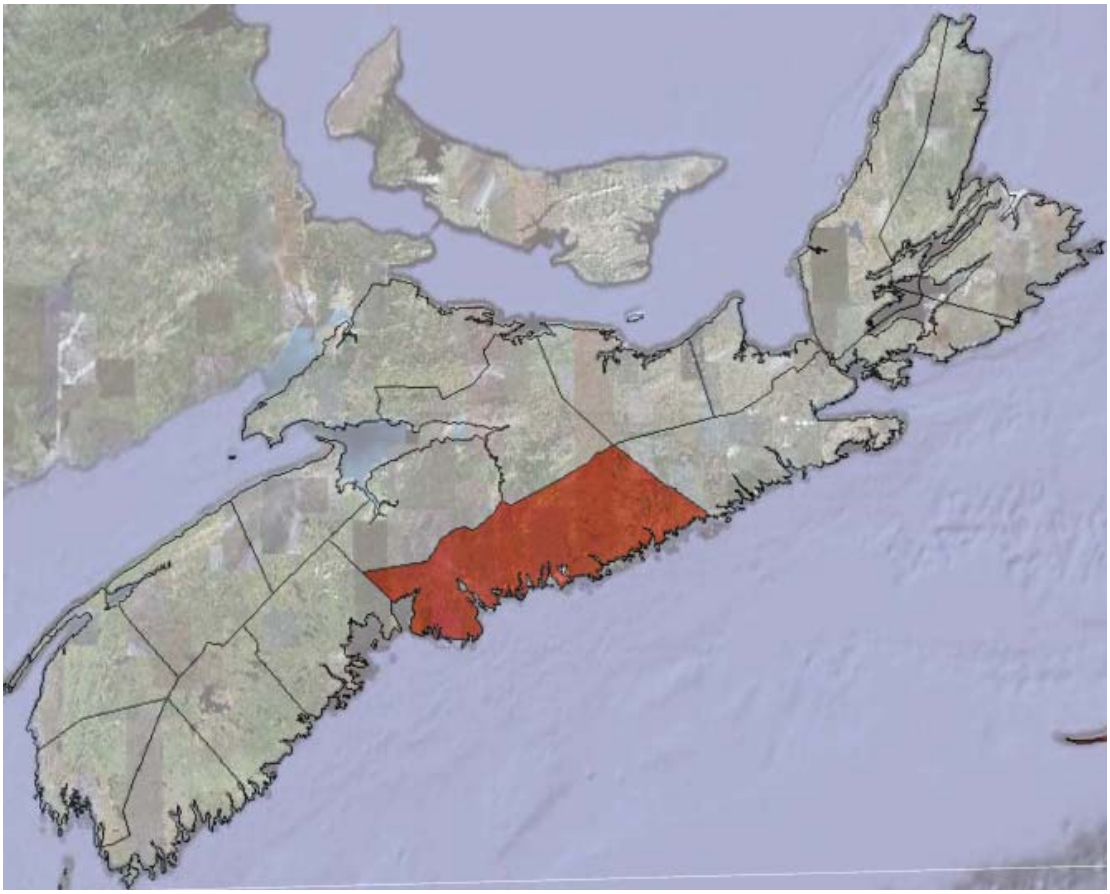

The highlighted area depicts the Halifax Regional Municipality, Nova Scotia

1.0 INTRODUCTION

Transportation demand management (TDM) refers to a wide range of policies, programs, and services designed to improve the efficiency of transportation and roadways by seeking constructive and positive solutions for mitigating automobile congestion. TDM strives to achieve this by reducing the demand for vehicle use, especially single occupant vehicles (SOVs), by influencing travel behaviour and providing more travel options to residents, such as transit, walking, cycling, and ridesharing. Environment Canada describes TDM as "...the integrated approach to transportation planning that focuses on improving the efficiency of the existing transportation infrastructure and increasing the sustainability of the network through the management of transportation demand and modal integration"[1].

[1] *Environment Canada, Report on Canadian Alternative Transportation Programs, February 2005, pg. 1.*

Within the Halifax Regional Transportation Demand Management Function Plan (TDM Functional Plan), all of these fundamentals have been incorporated into specific goals and objectives for the Halifax Regional Municipality (HRM). The TDM Functional Plan is a synthesis of a considerable body of work that the HRM has developed over previous years, including the Regional Municipal Planning Strategy (RMPS) and Transportation Master Plan (TMP). The RMPS, the initial plan for the region, was adopted in 2006 as a guide for the expected growth and development of Halifax Regional Municipality (HRM). The main objective of the RMPS was to positively shape settlement and travel behaviour to encourage sustainable travel mode choice and increase efficiency in such a way that transit and other transportation alternatives become more viable than commuting in a SOV. Set in motion by the RMPS, the TMP was developed and was intended to guide management and development of HRM transportation systems over the course of a twenty-five (25) year period. Similar to the RMPS, the TMP sets out to sway commuting trends away from SOVs. The TMP consists of five (5) inter-related functional plans, one of which is the TDM Function Plan, working together comprehensively to harmonize and maximize HRM's transportation networks, infrastructure, and systems to a level that is sustainable and proficient.

Using the context established in previous plans, the TDM Functional Plan aims to establish an efficient, sustainable transportation network of policies, programs and services that intend to reduce SOVs and the negative impacts associated with automobile-use. In harmony with the other plans developed in the HRM, the TDM Functional Plan focuses on increasing the use of sustainable modes including walking, cycling and transit rather than increasing roadway capacity. TDM objectives are aimed to help communities get out and get active, rely less on automobile use, reduce negative impacts associated with automobile use including both environmental and human related health hazards, reduce the fiscal and social impacts associated with the expansion of roadways and parking infrastructure, and achieve municipal goals such as greenhouse gas (GHG) emission reduction targets, all while improving the efficiency of the transportation network.

Boulevard Transportation Group was retained by the Halifax Regional Municipality (HRM) to develop the Halifax Regional Transportation Demand Management (TDM) Functional Plan. This report provides a review of municipal TDM best practices, a description of barriers to municipal-level TDM and modal shift, an inventory of TDM measures adopted in other municipalities, and recommended TDM strategies and implementation for the HRM.

1.1 Vision + Objectives

The TDM Functional Plan seeks to create a more effective and efficient regional transportation system in which alternative modes of transportation are promoted and reliance on SOV trips are reduced through infrastructure, programming, education and promotion. The TDM Function Plan aims to develop a balanced, equitable, and efficient transportation system that provides a full range of transportation choices. A plan that reinforces the liveability of neighbourhoods, supports a strong and diverse economy, reduces air, noise, and water pollution; and lessens reliance on the automobile while maintaining accessibility. Specific goals of the Functional Plan are as follows:

1. Identify and implement opportunities and programs to reduce transportation energy consumption and emissions.

- Promote and educate HRM residents about ways to reduce reliance upon SOV trips, particularly during peak travel times; and
- Develop set of options to reduce transportation related energy consumption and greenhouse gas emissions.

2. Maximize the availability, appeal and use of fiscally sustainable, environmentally responsible and integrated transportation modes.

- Consider overall transportation goals and how TDM is incorporated; and
- Ensure accessibility to transportation for all by encouraging the provision of a variety of transportation modes.

3. Enhance and support the use of alternatives to single occupancy vehicle trips.

- Encourage telecommuting, walking, cycling, transit, vanpools, park & ride and ridesharing;
- Maximize inter-connectedness between public transit, vanpools, carpools, walking and cycling; and
- Adopt engineering design and planning standards that are supportive of public transportation, cycling and walking.

4. Ensure land use and urban design support fiscally and environmentally sustainable transportation.

- Integrate transportation and land use through mixed use, transit-oriented, pedestrian friendly developments;
- Develop policies that require TDM is considered as part of development approvals; and
- Encourage the development of interconnected public streets that are safe and convenient for pedestrians, cyclists, and easily served by transit.

5. Ensure that TDM is disseminated to both HRM staff and residents.

- Through the continued development and implementation of an educational and promotional campaign to encourage behavioural change for peak travel periods;
- Continue to promote and implement the commuter trip reduction program for HRM employees and fleet management program; and
- Educate large employers in the region about the benefit of the workplace commuter options program.
- Use lessons learned from the ecoMOBILITY pilot program to continue to encourage new programs at workplaces.

2.0 TRANSPORTATION DEMAND MANAGEMENT 101

2.1 What is TDM?

TDM is a set of strategic initiatives geared at improving the efficiency of the transportation network, encouraging alternatives to the single occupant vehicle trip and encouraging behavioural change[2]. It refers to a use of policies, programs, services and products to influence whether, why, when, where and how people travel. TDM measures help shape the economic and social factors behind personal travel decisions, and are complemented by supportive land use and transportation supply[3]. TDM typically includes education, marketing and outreach, as well as travel incentives and disincentives to influence travel behavior. TDM strategies support infrastructure planning, but do not include infrastructure planning themselves.

[2] *Halifax Regional Municipality, Regional Municipal Planning Strategy, August 2006.*

[3] *Association for Commuter Transportation of Canada, The Case for TDM in Canada, October 2008*

2.2 The Benefits Associated with TDM

The benefits associated with TDM are varied depending on the strategies employed and the context in which they are employed. Generally speaking, TDM facilitates increased travel via alternative travel modes, resulting in economic, social and environmental benefits. TDM benefits often include the following specific outcomes:

- Improved land use efficiency in HRM by supporting regional planning objectives by encouraging compact, well-connected settlement patterns.
- Reduced water, air and noise pollution on surrounding natural environments.
- Reduced traffic congestion by increasing use of sustainable travel modes.
- Reduced collision risks associated with wide-spread automobile use.
- Increased the range of travel options available for all community demographics.
- Minimization of the costs associated with personal transportation by providing cheaper alternatives to vehicle travel.
- Decreased public investment in infrastructure by building demand for travel modes that rely on cheaper infrastructure and services.
- Improvements in community health due to increases in physical activity associated with self-propelled travel modes, such as walking and cycling.
- Support for a community's economic objectives, such as increased productivity, employment, wealth, property values and tax revenues.
- Support for local governments to help manage their transportation systems, provide a balance between travel modes, and ensure they make the most cost-effective and strategic infrastructure improvements.
- Effective support and addressing of many of the long range goals of local, regional, provincial and federal governments.

- Support for the policies and programs that result in a sustainable transportation system such as land use planning, parking policies, sustainable site design and focused programs that seek to maximize the liveability of a community through encouraging behaviour change.

2.3 TDM in Canada

Transportation demand management has been an increasingly important component of transportation planning over the several years in Canada. Its significance can be seen in the creation of the Association for Commuter Transportation of Canada (ACT Canada) and the increase in funding and information from Transport Canada. ACT Canada is the Canadian national association that was created to meet the needs of TDM professionals in Canada and is the premier gateway for TDM resources in Canada. The association serves its members by providing quality tools, resources and services. ACT Canada fosters partnerships and offers networking and professional development opportunities for its members.[4] These opportunities include the annual TDM Summit which provides TDM practitioners with the ability to meet in person; cross-country workshops; and various documents outlining TDM applications in Canada. These documents include: *Building Capacity for TDM in Canada Needs Assessment Report; The Case for TDM;* and *TDM Supportive Guidelines for Development Approvals.* These documents and events form the basis for TDM in Canada.

Through Transport Canada, the federal government has contributed to the increased awareness of TDM in Canada, mainly through the funding of a variety of programs, projects and studies. Transport Canada has been funding sustainable transportation projects in Canada, developed by non-government organizations, municipalities, transportation authorities and the federal government for many years. These funding programs have resulted in numerous pilot programs, studies and reference materials which have enabled TDM professionals to have access to information on the activities occurring throughout the country and to work not in a vacuum but rather as part of a community of sustainable transportation practitioners.

[4] *From ACT Canada's Website, taken June 6, 2010.*

2.4 TDM Strategies + Best Practices

Successful TDM programs require commitment and strong leadership to build key partnerships. A large part of the process is reliant on internal and external partners to facilitate the process. Internal partners include: transit operators, traffic engineers, land use planners, communications experts, facility operators, recreational coordinators, environmental managers and public health professionals. External partners include: public service providers, businesses/organizations, schools and community groups. Partnerships are vital in the process as they extend the distance reached by TDM programs, ensure credibility and add resources to maximize the impact of municipal TDM investments. Successful TDM programs also require a fair amount of foresight as the benefits are not immediate and require substantial resources. Only those with an avant-garde vision can see that the return on TDM investments is far more beneficial than that of the traditional approach to meeting transportation demand.

TDM strategies may be categorized into a few different areas, each of which are addressed later in this Plan. Categories include the following:

- *Transportation Options* – improving the range, type, and quality of alternative transportation options available.

- *Transit-Oriented Development* - Transit-oriented development (TOD) is a specific approach to land use planning that places transit as the primary travel mode and creates a development policy/regulatory framework that supports transit use. Enabling TOD involves identifying urban nodes where transit will focus, and establishing land use policies to encourage transit-oriented development in these areas. TOD is concerned with density around transit stations and a mixture of uses in compact areas to increase walkability and a restructuring of urban design to focus on transit and pedestrian priorities rather than automobile priorities.

- *Public Transportation* - Creating an environment where transit is easy and inexpensive to use is an important part of successful TDM programs. Increasing service, including more routes covering more area, increased frequency, and longer hours of operation as well as improving coordination among transit modes, such as buses, trains, ferries and airports, makes transit more convenient for users. A number of municipalities have implemented innovative strategies to make transit passes more economical and easily attainable, including creating partnerships between the transit authority and schools, employers and municipalities to offer reduced rate transit passes available for purchase at places of employment or education.

- *Pedestrian* - Walking is increasingly being seen as a healthy and inexpensive form of transportation. In recognition of the growing importance of walking in developing a more balanced, multimodal transportation system, it is important to ensure pedestrians feel safe when choosing to walk to work or school. Improving the overall walking environment in an area by ensuring the safety of sidewalks and crosswalks, and roadway conditions such as road widths, traffic volumes and speeds, is one way to encourage walking as an alternative form of transportation.

- *Cycling* - Providing safe cycling routes and facilities help encourage people to cycle more often. Infrastructure improvements, such as on-road safety and off-road pathway improvements, lane marking, signage and designated bike routes help to create bicycle friendly roads for users. Providing trip end facilities, such as bicycle racks, showers and lockers gives cyclists the opportunity to park their bicycles in a place that is convenient and secure and will ensure they can shower and change their clothes once they reach their destination. Additionally, bike rental and bike share programs, as well as free bike usage has been implemented as a way to encourage people to cycle.

- *Rideshare* - Alternatives to the single occupant vehicle include ridesharing and ridematching strategies. Carpooling and vanpooling utilize the otherwise unoccupied seats in a single vehicle travelling to a similar destination so users may share the cost of each trip. Rideshare programs include ridematching services which assist travellers in finding travel partners who need to go to similar locations in the same direction. Similar to HRM, cities such as Kamloops provide an online services to assist residents in finding a rideshare match. Other municipalities also implement strategies that give rideshare vehicles priority in traffic and parking, such as rideshare only parking and high occupancy vehicle lanes.

- *Incentives and Disincentives* – tangible benefits or disbenefits to encourage use of alternative transportation modes.

- *Information, Education, Marketing, and Promotion* – supporting programs to improve awareness and acceptance of alternative transportation.

- *Education & Promotion* - Educational and promotional campaigns are often undertaken by a municipality as an effective means to encourage the public to use sustainable modes of transportation. As individuals become accustomed to reaching their destination via private automobile, it is important to alert them to the variety of transportation options available to them, as well as to the steps the municipality has taken to facilitate this process.

- *Online Information Systems* - Online information systems allow anyone with internet access to access maps and information on the travel options available to them. A number of information systems were observed, some more effective than others. Below are some of the characteristics of a successful system:

    - Information systems should be integrated and multi-modal, allowing users to visually interpret the interconnection between different travel modes. This requires a central agency administering the service.

    - Information systems are more likely to be utilized regularly if they are appropriately marketed and designed in a format of which users can easily navigate around the site. Clear menu options and a home page link are essential.

- *Parking and Land Use* – parking and land use management strategies that passively influence individual travel behaviour to encourage sustainable transportation modes.

- *Land Development* - Land use factors, such as density, mix and connectivity influence transportation by affecting the distances that need to be travelled between destinations and the relative efficiency of different modes. Some TDM strategies change land use patterns directly and most TDM strategies affect land use indirectly through impacts on travel behaviour.

- *Policy and Regulations* – regional policy and regulatory approaches that encourage alternative transportation through regional planning, private development, and on-going operations.

2.4 Municipal TDM Challenges

2.4.1 Physical Environment

One of the most influential factors in choosing which mode of transportation to use is the physical environment. The physical environment has the potential to create a major barrier to implementing successful TDM strategies. Despite a municipality's best efforts to make sustainable travel modes accessible and easy to use, if residents do not feel safe and comfortable walking, cycling or taking transit to and from a destination, as well as within that destination, they will fail to choose these sustainable modes. The level of comfort and safety felt is affected by distance and the ease of travel by foot, bicycle, or transit. The destination needs to feel integrated into the surrounding community, rather than isolated from it. The physical environment at the destination has the capacity to make it feel like the destination was designed for people. In order to create a people and pedestrian centered environment, a destination must be free of large parking lots, multi lane roads, and other infrastructure that creates an unsafe or unwelcoming physical environment[5].

2.4.2 Established Policy/Regulations (parking, land use, etc)

Municipalities whose land use regulations call for rural, single-use development with large lot sizes present a barrier to implementing TDM. In areas with low-density land use, people are located farther away from their destination and each other. This presents a barrier to the use of sustainable modes of travel. Similarly, areas without mixed-use land development create separate nodes of land use, increasing the distance residents must travel to arrive at shopping, entertainment and employment centres and schools. As distance to a destination increases, the willingness of people to walk or cycle to that destination decreases. To overcome this barrier, it is important for municipalities to implement land use regulations that call for mixed use, higher density land use so that residents can be located within walking and cycling distance to destinations that they visit daily.

A municipality's parking policy, which includes parking facility regulation and pricing, may create a barrier to TDM by making parking appealing and cost efficient for residents, thereby encouraging single occupancy vehicle travel. A policy that increases parking supply and/or lowers parking price creates an environment where people will travel more frequently, travel further, and increase the number of vehicles owned per household. When used in conjunction with improvements to sustainable modes of transport, reducing parking supply and increasing parking price can be effective in applying TDM strategies and reducing peak period automobile traffic. Additionally, generous parking policies

[5] *King County, Transit Oriented Development, January 2010*

encourage low-density land use with dispersed destinations that are less suited to walking and transit. Allocating land and funds to vehicle parking decreases the resources available to support sustainable modes, and therefore policies that increase parking supply reduce overall transportation choices available in a community.

2.4.3 Entrenched Cultural Preferences

Entrenched cultural preferences towards the use of the automobile have a major effect on transportation and the willingness to choose, or even try, sustainable modes of transport. Some vehicles, and driving itself, are attached to a certain level of prestige in society. Many people make a habit out of driving for recreation, as well as owning, fixing and maintaining motor vehicles. Automobile travel is considered dignified and enjoyable, and use of sustainable modes such as walking or cycling is often stigmatized as less convenient, pleasant or respectable. Furthermore, the culture of the automobile has created an entrenched dependence on the automobile, especially in areas of low density and areas such as outlying suburbs where residents have to travel great distances to shopping or employment areas. While various transportation modes may be equal or superior in terms of convenience, cost, travel time, and enjoyment, users have a perception that driving alone is the quickest, most convenient, or most enjoyable mode of travel. These deeply entrenched cultural preferences may be overcome with appropriate TDM marketing, education, and promotion.

2.4.4 Funding for "Soft" Infrastructure and Programs

TDM programs are often in need of initial funding to support improvements and marketing campaigns. Often, municipalities only recognize traditional hard forms of infrastructure such as roads, transit buses, and traffic lights as significant, while failing to recognize the importance of soft infrastructure such as research, planning, and marketing. TDM programs are often less tangible; it may be more difficult for the public or government to measure or witness their success because they are not visible, unlike visible measures such as new bike lanes or traffic signals for example. To attain funding for soft infrastructure, it is imperative to provide detailed case studies of success stories that illustrate local, substantial end results such as a reduction in congestion or increased revenue to transit services. This TDM Functional Plan will provide the tools necessary to carry this out.

2.4.5 Lack of Education/Awareness

As mentioned above, oftentimes sustainable modes of travel are superior in that they may be faster or more economical than SOV travel. TravelSmart is a good example of a method that educates individuals about the benefits of choosing other modes of transportation. Web-based education is another way to reach the public. It is important to reach the widest population base in the education and awareness campaigns; however attention should be paid to people who have expressed an interest in making a change because they are more likely to be willing to listen and act on the information provided to them. For example, employees may be concerned about not having a car at work in case of an emergency or a requirement to work unexpected overtime. Being educated about the Guaranteed Ride Home can alleviate these concerns by providing the security of knowing that a free ride home will be available if needed.

3.0 REGIONAL TDM CONTEXT

An individual's travel behaviour is a product of the transportation options available to them. In developing TDM options, it is important to recognize the options that are currently available and how those options influence travel behaviour and mode choice. This chapter includes the background information needed to understand travel habits, including the following:

- Regional settlement and employment patterns, and their affect on personal mobility;
- Regional travel options, including transportation infrastructure and travel programs; and
- Future transportation plans and policies.

3.1 Settlement and Employment Patterns

HRM's built-up regions are located on a considerable area of land centred on the Halifax Peninsula, with a number of outlying communities in and around the periphery. The density and spatial distribution of these settlements affect the transportation modes that are the most and least efficient in the area.

3.1.1 Residential

Considerable population growth in HRM is currently happening on the Halifax Peninsula in a ring formation around the harbour. Outlying communities outside of the downtown are also experiencing a great deal of growth. These outlying communities are an important inclusion in TDM plans as they account for a significant percentage of the SOV commuters coming in and out of downtown Halifax (and into and through the Peninsula).

3.1.2 Employment

Regional employment patterns also influence the provision of transportation services. Local employment settlements are centred around service and knowledge-based industries. Significant employment centres include Capital Health (peninsula hospitals), Burnside Industrial Park/City of Lakes, Eastern Passage/Shearwater, Bayers Lake, Department of National Defense, Nova Scotia Power, Provincial and Municipal staff, the Halifax International Airport/Aerotech Business Park area, and all colleges and universities in the area[6]. A recent survey conducted by Regional Planning (2002 HRM Citizens Survey) revealed that among HRM residents employed outside of their homes, forty-four percent (44%) work on the Halifax peninsula[7].

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[6] *Greater Halifax Partnership, October 2005.*

[7] *Halifax Regional Municipality, A Blueprint for a Bicycle Friendly HRM, December 2002.*

3.1.3 Size of the Built-Up Area

The core area of Halifax is relatively small and compact, despite recent growth, and in fact, most of this growth can be captured in a circle with a ten kilometre radius, indicating that many destinations in the core area are still within a reasonable distance for sustainable mode choices. Some of the outlying communities, however, are not serviced efficiently, and unreasonable travel distances make it difficult to use sustainable transportation options. If these areas were developed with TDM objectives, and built to facilitate sustainable travel and transportation hubs that link these regions to major service areas in and around the HRM, then sustainable mode choices would become more viable. It was recommended in the RMSP that densification of all major settlement regions and centers be encouraged.

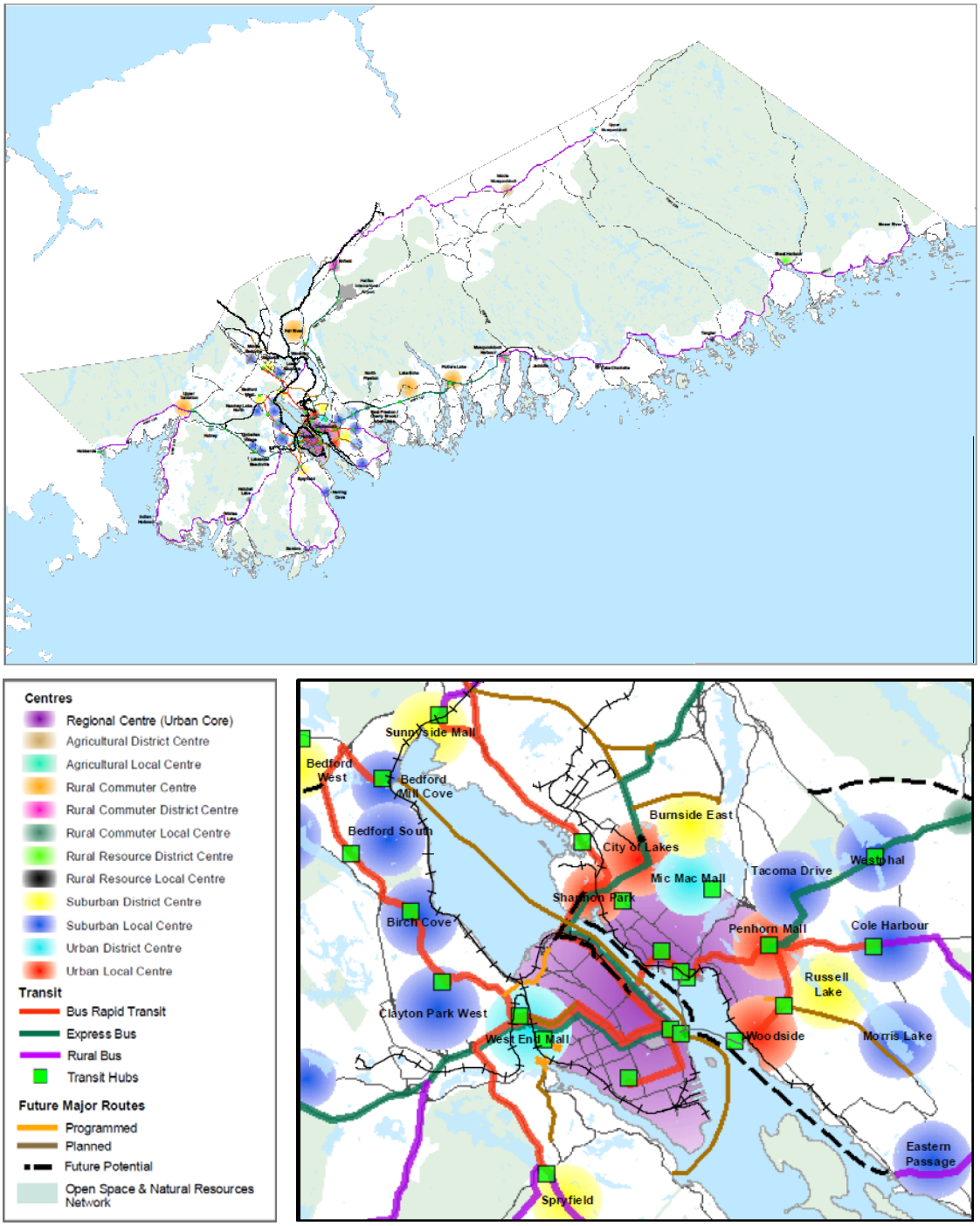
3.1.4 Future Settlement Policies and Bylaws that Support TDM

Future settlement should focus on location efficient development and cluster development policies to ensure development occurs near transit hubs. Bylaws should be implemented that ensure any new centres are built with high quality public spaces featuring public squares and parks, community gardens, public art, and a comfortable and safe environment for pedestrians and cyclists. New developments, commercial, civic, or residential, should include mixed-used transit-oriented centres that support sustainable modes of transportation. Land use planning for centres and new developments should always provide safe and walkable communities, sidewalks, biking paths and easily accessible transit to reduce physical inactivity and improve the health of HRM residents.

A growth strategy from the RMPS, gives specific growth targets over the next twenty-five (25) years for different areas in HRM, including twenty-five percent (25%) of growth in core areas, fifty percent (50%) of growth in suburban areas, and the remaining twenty-five percent (25%) of growth in outlying communities[8], s*ee Figure 1*. These targets are intended to ensure sustainable growth for years to come. The intention of having the highest percentage of growth in suburban areas is not to promote sprawl, but rather to ensure settlement patterns compliment transportation objectives and, more specifically, to guarantee commuters have viable alternatives to SOVs. The targeted areas have been carefully selected to support TDM facilities such as transit and other alternative modes.

[8]*Halifax Regional Municipality, Regional Municipal Planning Strategy, August 2006.*

Figure 1 – HRM Settlement and Transportation



Source: HRM Regional Municipal Planning Strategy

3.1.5 Environment

In pursuit of objectives outlined in the *Halifax Regional Municipality Corporate Local Action Plan* to Reduce GHG Emissions, sustainable transportation is a step in the right direction. Sustainable modes of transportation reduce all external costs associated with SOV use and auto-based infrastructure, including significant reduction in GHG emissions. In the Plan, HRM's vision was to become a leader in environmental sustainability amongst Canadian municipalities. With this objective in mind, the "HRM officially became part of the Federation of Canadian Municipalities (FCM) twenty percent (20%) club, now referred to as the PCP program, in 1997 and was one of the first four (4) cities to sign on and make the commitment to reduce its GHG emissions. Regional council committed to reducing GHG emissions twenty percent (20%) below 1997 levels by 2012 as part of the PCP program.[9]" The TDM Functional Plan will provide a greater opportunity to achieve this goal. Within the goals and objectives of this TDM Functional Plan are transportation and environmental features that are intended to reduce GHG emissions. Environmental features within this plan include:

- Solutions and recommendations that reduce air pollution associated with transportation, the auto industry and energy production, all of which have external costs, which harm physical health and environmental well-being;
- Environmentally and economically sustainable land use planning;
- Settlement and transportation policies that promote compact development and active transportation, providing more transportation alternatives.

3.2 Parking Pricing

"HRM residents are fairly dependent on private automobiles with approximately seventy-eight percent (78%) of all commuting trips taking place by car, and sixty-eight percent (68) of commuting trips by cars with only one occupant. However, for commuting trips to the urban core (Downtown Halifax and Downtown Dartmouth), there is substantially less reliance on passenger cars. Almost half of work trips originating in the urban core are made by public transit, walking, cycling, or other non-auto modes[10]."

[9] *Halifax Regional Municipality, Corporate Local Action Plan to Reduce Greenhouse Gas Emissions, August 2005.*
[10] *Halifax Regional Municipality, Regional Parking Strategy Functional Plan, August 2008.*

Automobile reliance varies depending on supply, price, location, and availability of parking as well as supply, quality, and level of service for sustainable travel and infrastructure. HRM has fairly high rates of free parking with forty percent (40%) in Downtown Halifax and fifty-four percent (54%) in Downtown Dartmouth and based on an attitudinal survey conducted for a previous study, twenty-nine percent (29%) of auto commuters responded they would shift to another mode of transportation if parking was priced[11].

Parking, and the associated cost, has a huge influence over the incentive and disincentive of driving. As a TDM strategy, parking is one of the most effective management tools to influence travel patterns and behaviour. Parking supply characteristics such as price, location and convenience are effective measures that if properly inhibited, will influence mode choice positively.

3.3 Existing Sustainable Transportation Options in HRM

HRM is comprised of existing infrastructure and travel options that allow HRM residents to meet daily mobility needs. Existing options are reviewed below to both understand how transportation occurs and identify opportunities to improve infrastructure supporting TDM.

3.3.1 Transit Services

The HRM operates a comprehensive public transit system providing seven (7) services throughout the region, which include:

- Conventional Bus
- Harbour Ferries
- Free Ride Everywhere Downtown (FRED)
- Access-A-Bus
- Community Transit Bus
- MetroLink
- MetroX

Conventional Bus

- A total of 52 conventional bus routes cover most of the region and connect with various other services offered. The Metro Transit fleet consists of approximately 300 buses.

[11] *Halifax Regional Municipality, Regional Parking Strategy Functional Plan, August 2008.*

Harbour Ferries

- Halifax Harbour Ferry service has three (3) operative ferries that run between downtown Halifax and Dartmouth. The Woodside ferry runs between downtown and Woodside.

Free Ride Everywhere Downtown (FRED)

- The Free Ride Everywhere Downtown (FRED) is a free downtown shuttle service operated during the summer months and funded by the Downtown Halifax Business Commission.

Access-A-Bus

- This bus service is a door to door shared ride for passengers who are unable to use convention transit systems.

Community Transit Bus

- Community transit buses run from major transit stations to rural outlying communities. Community transit buses currently services Porter's Lake, Beaver Bank / Fall River, and Sambro to the urban transit system.

MetroLink

- MetroLink is a premium Bus Rapid Transit (BRT) service in the HRM. The service is intended to provide faster and enhanced commuting options into downtown Halifax. There are three (3) MetroLink routes (Portland Hills, Woodside and Sackville) which provide express bus services to Scotia Square

MetroX

- MetroX is a rural commuter service linking outlying rural areas to key destinations between Halifax and Tantallon, with future plans to expand the service to other rural commuter centres.

HRM MetroLink (left) and MetroX (right) Vehicles

Metro Transit currently offers a number of supporting programs and services that encourage transit ridership, including:

- A UPass program for all students of Dalhousie University, Saint Mary's University, King's College, Nova Scotia College of Art and Design, and Mount Saint Vincent University;
- The GoTime automated information system is currently being tested (soon to be completed), and provides transit passengers with bus tracking and real time schedule information; and
- The Google transit trip planner is a Google Maps platform integrated with Metro Transit schedule and bus stop information.

3.3.2 Existing Cycling + Trail Facilities

A limited number of bicycle facilities have been built over the years, some of which include:

Macdonald Bridge Bike Lanes

Established in 1999, the Macdonald Bridge bike lanes have improved cycling in HRM considerably by providing a critical bicycle link between Halifax and Dartmouth.

Trans Canada Trail at Lake Banook

A multi-use trail between Prince Albert Road and Lake Banook provides a good bikeway system with primary and secondary routes.

Mainland North Linear Park Shared Use Trail

This is a three (3) kilometer multi-use trail that runs below the power lines between Fairview and Wedgewood and provides connections for a few major services areas for commuters.

Regatta Point Multi-Use Trail

This multi-use trail was established as a requirement for development in the area. The trail is fairly short and serves more as a recreational facility than a commuter route.

Beechville Lakeside Timberlea Rail Trail (BLT)

Established in 2001 this multi-use trail was developed along an abandoned rail line. It serves as a vital multi-use route through a moderate to high density suburban area.

Cole Harbour Salt Marsh Trail

This is a scenic waterfront trail that extends from downtown Halifax, east along an abandoned rail bed.

Phase I – Halifax Urban Greenway

A new multi-use trail developed along the CN Rail Cut in the south end of Halifax designed to accommodate all non-motorized users. Future phases are being planned.

On-Road Bicycle Facilities

There are multiple on-road bicycle facilities throughout HRM, including along: St. Margaret's Bay Road; Purcell's Cove Road; Wright Avenue; Shore Drive (Eastern Passage); Bedford Highway; and Kearney Lake Road and Trunk 1 (Sackville Drive).

3.3.3 Proposed Active Transportation (AT) Facilities

Numerous AT facilities have been proposed in the Active Transportation Plan. The facilities are intended to improve upon the existing facilities and increase connectivity between key destinations and major settlement areas. A few of the proposed facilities include:

- Trans Canada Trail/ Shubenacadie Canal Greenway to the Halifax International Airport;
- Linking Trans Canada Trail to the core area of Halifax;
- Linking the Regional Trail to downtown Halifax and major employment areas;
- Linking existing and new residential developments to bus stations and transit hubs;
- The Macintosh Run Trail in Spryfield;
- The extension of the Cole Harbour Salt Marsh Trail from Bissett Road to Caldwell Road (and eventually on to Eastern Passage);
- An extension of the BLT Trail from Beechville to Bayers Lake Industrial Park (and eventually on to peninsula Halifax) also known as the Chester Spur line or Chain of Lake Trail; and
- A link along the Sackville River from Lower Sackville to Mount Uniacke.

4.0 REGIONAL TDM PLANS AND POLICIES

The HRM has developed a number of comprehensive community plans and strategy documents that support and reference the need for TDM in Halifax. The following is a summary of relevant policy and planning documents.

4.1 Regional Municipal Planning Strategy

The HRM's Regional Municipal Planning Strategy (RMPS) is the land use planning policy document that outlines strategies toward enhancing the quality of life in the HRM by fostering the growth of a healthy and vibrant community, a strong and diverse economy, and a sustainable environment. The RMPS places considerable emphasis on the integration of land use, transportation, the environment, heritage, economy and housing, making specific note of the need to integrate land use and transportation. TDM and the goals of this TDM Functional Plan complement the goals, objectives and principles of the RMPS, working specifically to realize the following targets from the RMPS:

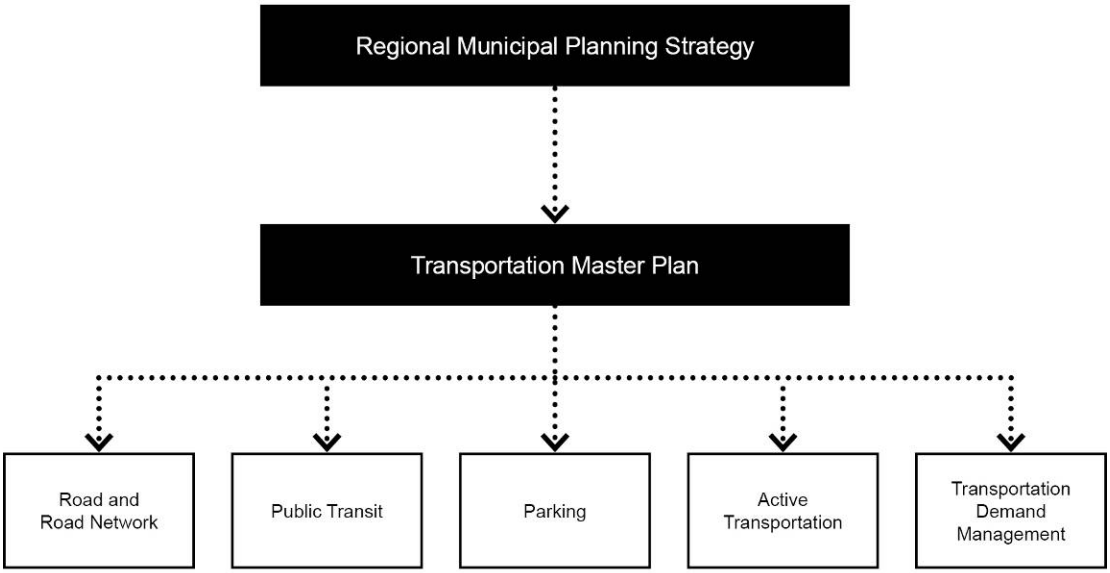
- Reduced regional greenhouse gas (GHG) emissions;
- Improved access to the core area and define it as a central hub for traffic and transit;
- Reduced network congestion;
- Better use of existing transportation infrastructure to reduce capital investment;
- Utilization of the Halifax Harbour as a natural transportation corridor;
- Developing walkable, mixed-use communities to encourage walking;
- Creating transit supportive communities that make transit more accessible at a reduced cost.

Sustainable transportation is one of the cornerstones of the RMPS and is intricately tied to the development of sustainable communities. By linking land use planning and transportation planning, the development of TDM policies and programs will become more obvious in HRM. Linking communities that are compact, mixed use and transit-oriented creates pedestrian-friendly environments that simultaneously reduce reliance on SOVs. The goal of integrating transportation and land use planning in the plan is seen best in the promotion of a settlement pattern which integrates mixed-use, transit and pedestrian-oriented centres with a complementary, multi-modal transportation system.

The RMPS recommended the creation of the Transportation Master Plan (TMP) and five (5) subsequent functional plans related to regional transportation (which are reviewed in the following sections), *see Figure 2*. The five (5) functional plans include:

- Active Transportation Plan;
- Road and Road Network Plan;
- Public Transit Functional Plan;
- Transportation Demand Management Plan (this document); and
- Regional Parking Strategy.

Figure 2 – HRM Planning Structure



4.2 Transportation Master Plan

The Transportation Master Plan (TMP) places considerable emphasis on the provision of transportation infrastructure and services enabling the community to meet mobility needs in a more sustainable manner. It makes reference to TDM in a number of ways[12]:

- Encouraging car and van pooling and greater use of transit;
- Strategically investing in a road transportation network designed to provide options to HRM residents, business and visitors and to improve the commuting experience;
- Improve Metro Transit's service levels and ridership through increased coverage, the Bus Rapid Transit (MetroLink) Service and express bus service;
- Encourage alternative modes of transportation, including the provision of an active transportation system and network;
- Develop growth centres that are designed to encourage the use of alternative modes of transportation, especially transit.

In addition to the RMPS and TMP documents, five (5) additional functional plans were recommended. Brief descriptions of the following plans, as shown in *Figure 2*, are detailed below.

4.2.1 Road and Road Network Functional Plan

This plan intends to look at a variety of components dealing with road network efficiency and utility. Road function will be examined in the context of promoting a variety of transportation modes to fit in with the mixed-use/transit-oriented centres being planned for HRM. The classification of the system will be altered, as will street standards. The width of streets, setbacks, and the type of landscaping can all make a difference to how a street is perceived and how it is used. Changing the standards of street design will promote the use of sustainable modes of transportation.

[12] *Halifax Regional Municipality, Regional Municipal Planning Strategy, August 2006*

4.2.2 HRM Regional Transit Plan – Park & Ride, Express and Rural Transportation Services

The Public Transit Functional Plan examines a variety of transit options including conventional transit, MetroLink, community services, and rural service. Ferry services were also reviewed. Overall, a variety of public transportation options will be provided to HRM residents to encourage the use of sustainable mode choices. The public transit functional plan considers:

- Improvements to the existing transit system, including the cross harbour ferry system;
- Expansion of the MetroLink service;
- The development of a fast ferry service (called HarbourLink);
- The long-term possibility of rail or other transit when developing or responding to proposals affecting railway infrastructure, corridors or service; the long term possibility of rail or other transit when planning bus or ferry terminals; and preserving any rail corridors that CN abandons in the future to ensure that commuter rail service is retained as a possible mode of transportation for the municipality;
- The development of community and specialized transit services; and
- Improved transit service to the region's major business parks for employees and customers.

4.2.3 Regional Parking Strategy

The Regional Parking Strategy looks at the impact of parking on the decision to drive and its role in the overall transportation network and, in particular relevant to this plan, its role in TDM strategies and success. The parking strategy considers:

- Balancing the needs of the business, service and tourism sectors with transportation;
- Developing an overall direction for parking in both the HRM and outlying business, employment and retail centres;
- Incorporating on-street parking policies into the overall strategy;
- Examining methods of reducing parking demand;
- Investigating financial incentives to reduce the demand for parking, particularly commuter-related parking;
- Establishing maximum, as well as minimum parking standards and encouraging shared parking between users; and
- Developing policies and criteria that can permit a reduction in the requirements for automobile parking when bicycle parking is provided in a development.

4.2.4 Active Transportation Plan

The Active Transportation Plan (ATP) is an essential document for the development and promotion of a TDM program within HRM. As stated in the RMPS: "active transportation can assist in managing traffic by reducing the number of motor vehicles on the roads. There are important air quality benefits associated with active transportation. These ways of travelling must be treated as an integral part of the HRM transportation system, with appropriate facilities and supportive programs."[13] There are several aspects of active transportation outlined in the RMPS, all of which are supported through policies in other chapters. Walking is an important component to a healthy lifestyle and will be incorporated through the development of transit-oriented, pedestrian-oriented, mixed use centres, as outlined in the RMPS. Cycling is also a significant component to any ATP or program. Again, there is a lot of support within the RMPS for the implementation of more cycling infrastructure. Components of the ATP include:

- A recommended active transportation network;
- A phased implementation strategy, including cost estimates for the proposed network;
- Consideration for integrating the active transportation network with the transit system to encourage intermodal trips;
- Policies to integrate the active transportation network as part of community development, school and other public facilities locations;
- Framework for an educational and promotional campaign;
- Policies and proposed wording for municipal standards, rules and regulations which need to be amended to comply with these policies; and
- Potential funding mechanisms to add to municipal funding.

4.2.5 Halifax Transportation Demand Management Functional Plan

This plan, the HRM TDM Functional Plan intends on being a progressive transportation plan, designed to support walking, transit and cycling. This plan will help HRM work toward a balanced transportation system that is strongly integrated with the City's other plans and programs and neighbouring municipalities. Overall this plan intends to support efficient movement of people and goods.

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[13] *Halifax Regional Municipality, Regional Municipal Planning Strategy, August 2006*

4.3 Other Relevant Municipal TDM Plans and Policies

4.3.1 HRM Bicycle Plan

The HRM Bicycle Plan, Blueprint for a Bicycle Friendly HRM, was developed in 2002 to enhance liveability, health and well being of HRM residents. It has now been incorporated into the Active Transportation Plan, but still has relevance to sustainable transportation initiatives. The plan intended to accomplish this by creating an environment that is more comfortable, convenient, and encouraging to cyclists through:

- The use and adaptation of existing and planned infrastructure including roads and trails;
- The development and maintenance of new infrastructure to encourage bicycling;
- The provision of facilities that support bicycling such as bicycle parking, signage and connections to other modes of transportation;
- The provision of programs that support bicycling safety, education, and promotion, and;
- The incorporation of planning for cyclists into all relevant municipal activities and facilities.

4.3.2 Five-Year Strategic Operation Plan – Taking Transit to the Next Level

This is a five-year $155 million plan to expand HRM's transit network in accordance with the RMPS. This expansion will meet the transit needs of a growing regional population, students from several major universities in the area, Canada's east coast maritime fleet, and various other National Defence facilities all within the Halifax Regional Municipality (HRM). The service plan includes:

- More limited stop express services and transit priority measures
- A high quality and high frequency service in the Barrington/Spring Garden corridor in Halifax and the Portland corridor in Dartmouth
- Upgrade Woodside ferry to an all-day Monday to Sunday service in the next five years

4.3.3 Metro Transit Strategy

Developed in 2001/2002 prior to the Bus Rapid Transit (BRT) and the RMPS, this strategy was "developed as a comprehensive plan to identify practical and effective transit improvements and guide the short-to-medium term development of transit priorities for the Halifax Regional Municipality." The vision of this strategy was to improve transit to higher service levels and further increase transit ridership. "The current transit modal split for work trips is twelve percent (12%) while the Halifax Regional Council long term strategy is to have a transit modal split of at least twenty-six percent (26%) in the municipality's urban area. To accomplish this vision, Metro Transit will have to continue to improve its service levels in terms of improved service coverage, more direct and timely routes, increased frequencies, and faster, more reliable services. It will need to provide a frequent and high quality Bus Rapid Transit (BRT) services in the main corridors in Central Halifax and Dartmouth, MetroLink and Metro X services from the major population concentrations throughout the region, and limited stop express services in the high demand corridors where there are frequent stopping, fixed route services.[14]"

4.3.4 EcoMobility TDM Migration Fund

The TDM Migration Fund is a cash reserve generated from transportation-related revenue generators intended to influence transportation choices and guide it in the direction of sustainability. The word 'mitigation' refers to the migration of transportation choices, through pricing signals, from less sustainable to more sustainable methods.

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[14] *Halifax Regional Municipality, Five-Year Strategic Operations Plan, October 2009*

4.3.5 HRM Smarttrip – EcoMobility Guaranteed Ride Home Program

The guaranteed ride home pilot program aims to promote TDM in the workplace, discouraging employees from using SOVs (SOVs) to travel to and from work. This program will be incorporated into the package given to all employers who partner with HRM and the Workplace Commuter Options program, working cohesively to achieve the HRM goal to decrease GHG emissions by twenty percent (20%) from 2002 to 2012. The goal of the program is to provide sustainable transportation users an insurance policy to get home in an emergency and see an increase in the modal split towards sustainable modes such as cycling, transit and carpooling.

4.3.6 Trip Reduction Program

The Trip Reduction Program is a report with recommendations to reduce commuter trips among HRM employees. Included in the report are tools that will help make staff transition more easily and help create a culture where use of alternative transportation is desirable. It is the basis for HRM's Commuter Options Program, entitled SmartTrip. Topics include:

- Cycling – Rainy Day Option incentives, giving regular cyclists a discounted transit pass
- Flexible Working Hours – employees could arrive and depart from work outside of rush hour
- Active Transportation Incentives – workplace upgrades, training opportunities, etc.
- Transit Pass Discount Programs – EcoPass or UPass
- Guaranteed Ride Home Program – typically using taxis for a free ride home for staff
- Vanpool and Carpools – an informal program between co-workers
- Minimizing Impact of Driving Alone – a few things to reduce the impact of SOVs
- Fuel-efficient driving
- Trip chaining – reducing single purpose trips through multiple stops en route
- Teleworking – working at home one day a week
- Use of alternative fuels
- Use of hybrid and alternative fuel vehicles

4.3.7 Workplace Commuter Options

The Workplace Commuter Options is toolkit developed by HRM to assist organizations to foster a more efficient, healthy, and environmentally responsible way for their employees to travel to and from work. Using a step by step process, this toolkit helps users prioritize goals and establish alternative transportation modes to suite individual needs. The toolkit identifies four barriers that inhibit alternative modes:

- *Systemic* – such as unavailability of transit service or bike lanes in a person's area, concerns for safety walking in certain areas;
- *Personal* – such as requirement to run errands, pick up children after work, need to have the car at work, need to be able to go home in an emergency;
- *Perceived* – such as feeling that carpooling will be too inconvenient;
- *Attitudinal* – feeling an issue is unimportant or one's behaviour will make no difference.

This program is currently being piloted in 4 workplaces as part of the guaranteed ride home program, funded in part by Transport Canada's ecoMOBILITY Program.

4.3.8 ClimateSMART

The HRM developed an integrated strategy to reduce environmental impacts leading to climate change. Partnered with multiple levels of government and the private sector, the Municipality intended ClimateSMART to be a planning approach that aids in the adaptation and mitigation of climate sensitive programs and services. The program supports a wide range of activities and initiatives such as:

- Plans for a district energy system;
- A reduced idling campaign;
- A Clean Air Strategy; and
- A Community Energy Plan.

ClimateSMART is the first initiative of its kind at the municipal level that integrates and mainstreams GHG reduction and climate change impacts and adaptation considerations into its overall corporate-decision making process.

4.4 Provincial Plans and Policies for TDM

The Province of Nova Scotia is currently developing new initiatives to promote sustainable transportation practices and the use of transportation alternatives by employees of the department. These measures include (from the 'Sustainable Transportation Strategy', Nova Scotia Transportation and Infrastructure Renewal):

- Development of an internal Sustainable Transportation Code of Practice for the Department of Transportation and Infrastructure Renewal, including provisions for the following:
- Carpooling
- Promotion and support for active and sustainable transportation alternatives (i.e. provision of indoor bicycle storage and shower facilities in department buildings)

- Design, maintenance and promotion of an internet website designed to promote sustainable and active transportation among employees. Including:
- Sustainable/active transportation facts
- Links to sustainable/active transportation events, resources and organizations (i.e. Commuter Challenge, transit schedules, TRAX etc)
- Sustainable Transportation Code of Practice
- Ride-share/carpool finder
- Anti-idling policy

4.4.1 Conserve Nova Scotia

Conserve Nova Scotia, a government agency intended to incorporate energy efficiency and sustainable choices into daily lives. The agency is made up various programs, informing and promoting environmentally forward social behaviour. A few success stories from this program include the following.

Halifax's First Hybrid Cab

In 2008, a taxi driving in the HRM purchased a hybrid vehicle. The vehicle, a Toyota Camry Hybrid, power by a combination gas/electric motor, which kicks into electric power when traveling at low speeds or stopping at intersections or red lights. The result of this is significantly less GHG emission production and increased longevity of fuel.

HRM Hybrid Bus Project

On March 2nd 2010 two (2) articulated-hybrid buses were introduced to the streets of HRM. Similar to hybrid cars, the buses will see greater fuel efficiency and lowered emission of GHGs.

Nova Scotia Green Mobility Grants

Put together by the Ecology Action Centre, the Green Mobility Capital Grants Program is intended to assist communities with the purchase and improvement of sustainable transportation-oriented infrastructure. If projects are within the scope of eligibility for this grant, they can be awarded funding up to twenty-five thousand dollars ($25,000).

4.5 Federal Programs and Policies for TDM

The federal government is gaining momentum with sustainable transportation initiatives and grant programs. This has created unprecedented opportunities for Canadian communities, including the HRM, to take advantage of federal funding programs and address personalized TDM and sustainable transportation goals.

4.5.1 Moving on Sustainable Transportation (MOST)

A program that supports projects intended to educate the public, strengthen plans and policies, and incorporate mechanisms that will allow communities to adopt sustainable transportation. The MOST Program will provide funding to non-governmental organizations to help support projects that will:

- Stimulate the development of innovative tools, approaches and practices for increasing the sustainability of Canada's transportation system and the use of sustainable modes of transportation;
- Realize quantifiable environmental and sustainable development results on Transport Canada's sustainable development priorities; and
- Provide Canadians with practical information, tools and opportunities for better incorporating sustainable transportation options into their daily lives.

4.5.2 Urban Transportation Showcase Program

This federal program encouraged and supported the development of strategies, transportation planning policies and best practices to reduce GHG emissions. The program also demonstrates, measures, and monitors the effectiveness of a range of integrated GHG strategies in urban environments and evaluates the effects of these strategies for other important policy objectives. The UTSP has now been completed and information about the funded projects and other sustainable transportation initiatives can be found on Transport Canada's website.

4.6 TDM Examples from other Cities across Canada

While the fundamental aspects of TDM have existed for some time, creating plans/policies or entire departments dedicated exclusively to TDM and mobility management is relatively new to municipalities in Canada. This section reviews Canadian TDM programs at a municipal level.

4.6.1 Greater Toronto Area (GTA) and Hamilton, Ontario

The Greater Toronto Area (GTA), including Hamilton, provides an excellent example of a structured TDM governance model that acts at both a regional and local level. While the GTA/Hamilton is significantly larger than HRM, it does provide insight on how to effectively organize and oversee TDM. The program is funded through MetroLinx and administered on two (2) levels:

- The Smart Commute Association is the central organization charged with overseeing the region. The Smart Commute Association takes direction from a board of directors, as well as an advisory committee made up of representatives from all over the region.
- Ten (10) Transportation Management Associations (TMAs) represent communities throughout the region, comprised of municipal staff and stakeholder representatives.

The Smart Commute Association oversees regional marketing/promotions of TDM which includes branding, education, recruitment and incentives, as well as regional-level programs, such as an Internet-based ridematching application and an emergency ride home service. Additionally, a number of program modules are produced by the Smart Commute Association, which are policy/program templates that can be customized to meet the needs of smaller communities. The local TMAs work with the Smart Commute Association's program modules, tailoring them to the specific context in which they will be used. They also work with the regional educational and promotional material created by the Smart Commute Association and apply it to the context in which they operate. Essentially, the Smart Commute Association does much of the regional planning/policy work and the TMAs are responsible for implementation.

Innovative Programs/Measures

- Establishes a regional governance structure to plan TDM at a regional level and apply it at a local level.
- Regional policies/programs are established, but only applied to locales where warranted.
- Branding/promotions is done at a regional level and applied at the local level.

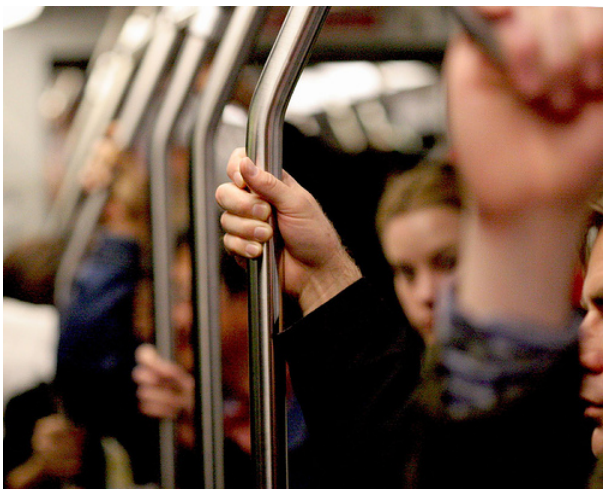
4.6.2 City of Kelowna, BC

The City of Kelowna developed a TDM program in 1999 as a response to a population boom in the surrounding region. A unique partnership was created, where the Regional District of the Central Okanagan contracted the City of Kelowna to provide a TDM service for the region. To implement this program, the City's Transportation Division created the TDM Working Group. Since initiation, the TDM Working Group has been instrumental in creating Downtown Bike and Sidewalk Master Plans, transit improvements, parking management and cycling improvements.

Innovative Programs/Measures

- 50/50 cost sharing program for the purchase and installation of bicycle racks for any business or community group interested. Applicants have the choice of colour and can choose from four (4) different sizes.
- All buses have been equipped to accommodate bicycles.
- Bicycle parking requirements have been included in the municipal bylaw for land uses such as multi-family residential, educational/institutional and restaurants.
- ECO-Pass for owners of qualified hybrid vehicles, which permits them to park at downtown on-street meters free of charge.
- Monthly parking rates in City-owned facilities are a minimum of ten percent (10%) greater than the monthly cost of a transit pass.

4.6.3 City of Kamloops, BC



The City of Kamloops' 1999 TravelSmart Program was a coordinated approach to growth management and managing transportation capital expenditures. Modelling was conducted to anticipate necessary road expenditures as a result of a number of urban growth scenarios. Two (2) growth scenarios were presented, the first based on the status quo, the second a response to minimizing transportation expenditures, including extensive transit and bicycle considerations. Both scenarios were evaluated and the transportation-based scenario was quickly chosen as the preferred scenario. The OCP has since been adjusted to reflect the transportation-supportive land use scenario.

In coordination with the transportation-supportive growth scenario, the TravelSmart Program focused on three (3) TDM programs – transit, bicycle and education/promotion. An Official Transit Plan was developed to guide transit efforts. The Transit Plan reviewed existing routing and scheduling, incorporated expected growth and anticipated routing and coverage needs, while exploring new revenue sources. A Bicycle Master Plan was another initiative that stemmed from TravelSmart; it addressed existing routing, developed appropriate route standards, explored integration options with other travel modes, and recommended appropriate trip-end facilities. The education and awareness portion of the program considered methods to deliver the various alternative transportation programs available to citizens. The program included a significant budget for the education and awareness portion in an effort to encourage participation in less well known TDM programs such as employer based trip reduction (e.g., ridesharing, guaranteed ride home), city-wide ride matching (matching commuters with common origins and destinations), alternative work arrangements (telecommuting, alternative work hours) and non-motorized transportation options (e.g., bike paths, pedestrian routes). The program incorporated principles and policies that support the integration of transportation planning and land use in both higher level Official Community Plans and lower level operational plans that determine day-to-day activities to help maintain ongoing commitment and policy consistency.

Innovative Programs/Measures

- Increased frequency of transit service to outlying communities and the use of smaller buses that feed into the main system.
- Transportation alternatives such as carpooling and biking are promoted through workshops and seminars in workplaces.
- Free carpool program which provides ride-matching assistance as well as a variety of information on ridesharing, including carpool benefits, cost-sharing arrangements and carpool etiquette.
- The U-Pass gives all Thompson Rivers University students unlimited access on all Kamloops Transit routes during the four-month semester. Each student is charged $40 per semester regardless of whether they use the transit system or not.
- The ProPASS is a permanent photo ID bus pass purchased at work through payroll deductions for $480 annually, and offers unlimited access on all Kamloops transit routes.

4.6.4 City of Whitehorse, Yukon

Similar to Halifax, Whitehorse was successful in securing federal transportation contributions through the Urban Transportation Showcase Program. Whitehorse used these funds for three (3) purposes – sustainable infrastructure, education/community outreach, and TDM. The TDM portion of their program focuses on transit and establishing travel applications that improve the availability and understanding of information.

Innovative Programs/Measures

- Personal trip planning application that tracks participant travel habits and offers suggestions for available modes and appropriate routes.
- Discounted transit passes for major employers and Yukon College.

4.6.5 City of Winnipeg, Manitoba

Resource Conservation Manitoba (RCM) has introduced a program called TDM at Your Workplace that encourages both employers and employees to facilitate and use alternative forms of transportation. Workplace TDM involves specific programs for employers to reduce the number of single-occupant vehicle commuter trips made by employees. Examples of initiatives that promote employee use of TDM include installing bike racks, showers and lockers, establishing a carpool program, providing a transit subsidy, offering a guaranteed Ride Home program and implementing alternative work arrangements such as telecommuting and flexible work hours. The RCM offers assistance to employees by helping with presentations to fellow employees and management on the benefits of TDM and Green Commuting, offering employee commuting surveys, and encouraging Commuter Challenge participation. The RCM also offers online manuals (the Green Commuting Guide for Workplaces and the Green Commuting Guide for Individuals) which aid employees and residents in setting up a TDM plan, building a TDM support system, setting TDM goals, and evaluating their TDM plan.

The plan has two overall goals:

- To develop a strategy for the implementation of a comprehensive network of cycling routes in Winnipeg ASAP.
- To show how the desire, experience and energy of hundreds of organizations can be harnessed to help make it happen.

The plan has seven (7) chapters, each with a specific goal:

- Bikeway Network: Establish a bikeway network that serves all Winnipeg residents and neighbourhoods.
- Bicycle-friendly Streets: Make all of Winnipeg's streets safe and convenient for bicycling.
- Bike Parking: Provide convenient and secure short-term and long-term bike parking throughout Winnipeg.
- Transit: Provide convenient connections between bicycling and public transit.
- Education: Educate bicyclists, motorists, and the general public about bicycle safety and the benefits of bicycling.
- Marketing and Health Promotion: Increase bicycle use through targeted marketing and health promotion.
- Law Enforcement and Crash Analysis: Increase bicyclist safety through effective law enforcement and detailed crash analysis.

Innovative Programs/Measures

- Secure bicycle parking corrals in downtown Manitoba available to cyclists for $50 per year.
- The EcoPass program allows employers to sell regular monthly transit passes to employees at a discount of thirty percent (30%) or more, up to one-third of which is rebated to the employer by Winnipeg Transit.

4.6.6 Calgary, Alberta - Calgary's Tools for Managing Traffic

As part of a strategy for managing traffic, Calgary has been implementing comprehensive TDM measures into their transportation network to manage the demand for roadway space. The strategy includes three (3) techniques, including transportation systems management (TSM), intelligent transportation systems (ITS), and transportation demand management (TDM). Using these three (3) strategies the City is taking the initiative and commencing the difficult transition from vehicles to alternative modes of transportation. The City is now incorporating carpooling, transit, walking, cycling, and vanpooling as first choice travel modes over vehicle use. Strategies encourage commuters to reduce the number of trips they make, reduce trips made in private vehicles, travel at non-peak times, and travel using alternative modes.

Other approaches that the City has adopted include reducing the number of trips through tele-commuting (working from home) and internet shopping, travelling at non-peak hours through adjusting business and work schedules, and compressing work weeks through giving employees every second or third Friday off. As a result of these compressed work weeks there have been significant

reductions in congestion and delays on Fridays. TDM strategies have also included increasing density and making transit more viable. By reducing sprawl and strategically developing in areas that are located within walking distance of local businesses and services, reduction in vehicles on the road is substantial.

4.6.7 North Vancouver, BC - Long-Term Transportation Plan

Developed in 2006, the Long-term Transportation Plan aims to provide a strategy and vision for a multi-modal transportation system. The main objective of this plan is to increase alternative modes of transportation which will increase active living and lower GHG emissions to create an overall greater quality of life for residents in the City. The plan is inclusive of cycling and pedestrian facilities, transit, and those with mobility challenges, s*ee Figure 3*. In support of the OCP, the following specific transportation goals were established:

- *Liveability*: The Transportation Plan will contribute toward the overall Vision of becoming a vibrant, diverse and highly livable community, where quality of life and community well-being are vital.

- *Mobility*: The Transportation Plan will support the safe, efficient, and accessible movement of people, goods and services throughout the City and beyond our boundaries.

- *Integration*: The Transportation Plan will support the development and integration of all modes of travel in order to offer more choice to the residents, workforce, and visitors of the City.

- *Affordability*: The Transportation Plan will recognize the financial constraints of the City and promote the development of transportation infrastructure and services that will best support the goals of the Plan.

- *Environment*: The Transportation Plan will support alternative means of transportation, namely walking, cycling and transit and promote strategies to manage travel demand in an attempt to reduce local greenhouse gas emissions.

Figure 3 – Features of the North Vancouver TDM Plan

4.6.8 City of Ottawa Transportation Master Plan

Adopted by the City in 2003, the Transportation Master Plan for the City of Ottawa aims to minimize the need for future road expansions using alternative methods and TDM measures to reduce levels of congestion on roadways. This plan has four major target areas which respond to major transportation challenges. These areas include:

- Land use planning;
- Transportation demand management;
- Transportation supply management; and
- New infrastructure and service

This plan aims to guide the City over the next decade, by 2020, to manage the growing transportation demand using TDM growth management strategies.

4.6.9 Capital Regional District, BC

The Capital Regional District's *Travel Choices Strategy – TDM Strategy*, is a plan that intends to implement TDM initiatives such as cycling, pedestrian and transit facilities. Each TDM initiative in this plan has been given an independent strategy specific to the region to ensure the goals and objectives are focused on relevant concerns with each transportation mode, rather than amalgamate them into one classification. The key features of the TDM Strategy include trip reduction programs, regional TDM programs, parking management strategies and other initiatives intended to encourage the use of alternate modes. Three goals established in this plan include:

- *Coordinate land use and transportation* – The more compact development pattern envisioned in the region's Growth Strategy makes other modes of travel than the automobile attractive. Consequently, TDM initiatives can be more easily implemented and will produce better results.

- *Encourage use of alternative modes* – Several objectives have been established for this goal which are relevant to TDM. These objectives include, increase the attraction of walking, cycling, transit and ridesharing, integrate different modes of transportation, provide a means for persons to find ridesharing partners, and reduce total travel through the use of telecommunications.

- *Maintain an affordable transportation system* – Objectives of particular relevance to TDM include, increase the direct cost to users of transportation facilities and services, and reduce the indirect costs to taxpayers, and emphasize modes of travel which minimize resources.

4.7 International TDM Success Stories

4.7.1 City of Boulder, Colorado

The City of Boulder has been a municipal success story since the implementation of their GO Boulder program in 1989. GO Boulder has focused on providing a world-class transit system and their efforts have paid off - approximately 60,000 of the 100,000 Boulder residents have a yearly transit pass.

Innovative Programs/Measures

- A portion of downtown parking revenues are used to provide 6,000 downtown employees with transit passes.
- A city bylaw requires developers to provide a bus pass for all residents for three (3) years.
- Regional safe ride home has been established that is funded by revenue generated from downtown parking.
- Interactive online route mapping application that provides information on transit and bicycle routes, as well as up-to-date road conditions.[15]

[15] *City of Boulder, Transportation Information Systems*

4.7.2 City of Seattle, Washington

The City of Seattle began a community based marketing program called Way-To-Go, Seattle! that is an umbrella organization for all of the coordinated efforts to encourage alternative forms of transportation. One program called One Less Car offers incentive such as rebates for transit or cycling gear if users commit to not drive their car for one month. If users sell their car, the program offers even larger incentives such as transit vouchers, bicycle gear, discounts on organic produce and free cycling club memberships. Another program called The Commuter Cash program offers up to $150 to drivers who regularly drive alone to work on most days of the week and commit to either begin carpooling or using other modes of transit. Other programs encouraging people to drive less offer participants the chance to enter monthly drawings for gift certificates for transit tickets and active apparel, while sending email tips and providing other online support tools.

Innovative Programs/Measures

- Material incentives to participants as a way to encourage the use of alternative modes.
- Online support to assist users with a seamless transition from single-occupancy vehicle use.

4.7.3 City of Perth, Australia

The City of Perth in Western Australia has implemented a successful program called TravelSmart which has been used in the United States and twelve European countries, and is currently being tested in Vancouver, B.C. TravelSmart focuses on individual marketing to show people how to conserve gasoline and increase their health and the lives of their cars by creating behavioural change in households that have indicated they are interested in choosing more sustainable forms of transportation. The program is based on the idea that people underestimate the time and cost of single occupancy vehicle use, while overestimating the time and cost of using alternative modes of travel. To market information that might help participants chose modes other than the single occupancy vehicle, TravelSmart focuses on building individual relationships with households and providing information specific to the area the participant lives in. For example, participants may receive, via a TravelSmart employee on a bicycle, the exact bus schedule for the nearest stop and a free transit pass, a bike map and a discount at a local bicycle shop, a walking tour of the neighbourhood and the nearest downtown, and/or a free pedometer. Furthermore, this information can be expanded on by a home visit from a local bus driver. Participants may be individually marketed up to twelve (12) times through personal visits, telephone calls, thank you backpacks, and letters to clarify every detail, answer every question and provide feedback which may show the participant where there is still room for improvement.

This program has been highly successful, due to the individual, personalized nature of the marketing and the idea that informing and empowering citizens to make their own decisions, rather than offering incentives or telling them what to do, creates lasting behavioural change. Through the TravelSmart program, Western Australia has decreased car miles driven yearly by fourteen percent (14%).

Innovative Programs/Measures

- Individual marketing to households who have already indicated they are potential travel mode switchers.
- Informs participants about how their specific vehicle use may be reduced, rather than speaking to a wide range of people who may live in different communities and have differing needs and driving habits.
- Participants are contacted in person, or by telephone or letter, rather than by email or internet, to ensure a meaningful, personal relationship.

5.0 PROGRAMS + SERVICES

There are a wide range of TDM strategies that encourage individuals to reduce the number of trips they make, to travel more often by non-driving alternatives, to travel outside peak periods and to reduce the length of their trips. TDM programs and services are actions intended to influence travel behaviour in this fashion. Below are a few of the most influential programs for TDM, including, sustainable transportation commuting alternatives, reserved lanes, and commuting trip reduction strategies.

5.1 Sustainable Transportation Commuting Alternatives

Most TDM programs and services, have an initial foundation in HRM and are run by the municipality or through private ownership. The significance for programs outside of municipal scope includes encouragement and promotion, to support all activities that endorse sustainable travel behaviour. Future TDM programs and services should be inclusive of all of the following TDM initiatives:

- Ridesharing programs;
- Transit pass programs (UPass, EPass);
- Support for carsharing programs;
- Park & ride
- Priority parking spaces; and
- Downtown shuttle services

5.1.1 Ridesharing Programs

Ridesharing is the shared use of a motor vehicle by two or more persons when they would otherwise travel separately. Contained within this category are carpooling and vanpooling, two forms of ridesharing. Carpooling and vanpooling equally reduce the costs involved in commuting and/or long distance driving by sharing cars and the costs associated with driving.

Carpooling refers to an organized ride, informal or formal, of which a driver gives one or more people a ride in a private or hired vehicle. Formal carpools are often computerized ride-matches that pair people going to a similar destination with a driver. Informal carpools are often friends, family, or co-workers sharing a ride with a driver.

Vanpooling is generally a formal system where several people pay a monthly fare to share a ride in a larger vehicle, which allows bigger groups of people to share a ride.

Existing Ridesharing Programs and Services

Two (2) ridesharing services that have been successful in HRM; 1) SmartTrip and 2) Green Rider Ltd.

1. HRM SmartTrip - Ridesharing

HRMSmartTrip.ca is an online ridematching system that allows commuters to find carpool partners by matching them based on proximity to origin and destination points, travel routes, working hours, and carpool preferences. The carpooling program services an area that includes all of HRM.

2. Green Rider Ltd.

Green Rider Ltd. is a private vanpool operation that serves outlying communities in the HRM. This service specifically targets commuters outside of the city center who have the longest commuting-time, thus sees the greatest concurrent savings/benefits from ridesharing.

Based on the existing conditions in HRM for ridesharing recommendations and implementation strategies were created as 'next steps' for the municipality.

1.0 Recommended Strategies for Ridesharing

AGGRESSIVELY EXPAND BOTH PUBLIC AND PRIVATE RIDESHARING THROUGHOUT THE HRM

(a) Undertake a coordinated region-wide assessment of the potential rideshare market in HRM

(b) Elevate marketing of ridesharing programs on campuses of universities and colleges.

- Use the results of the region-wide assessment to explain the impacts and promote the benefits of TDM initiatives. A few marketing strategies on campus could include:
    - Information booths
    - Promotional discounts to students who register
    - Informative advertisements in high traffic areas.

(c) Investigate strategies to remove barriers for increased ridesharing

- Increase the number of reserved parking spaces
- Ensure parking is guaranteed for rideshare vehicles
- Reserved parking spaces should be situated in the best locations
- Decrease the cost of parking for rideshare vehicles
- If charged at all, rideshare vehicles should receive discounted parking
- Rideshare users should receive an 'occasional parkers pass' which allows a parking space every now and then when the use of a private vehicle is necessary.

(d) Elevate importance, knowledge and awareness of ridesharing with transit agencies and other stakeholders

- Use the results from the ridesharing market assessment to explain the impact of ridesharing and promote the benefits.
- With marketing directed at HRMs main employers, set goals to reduce commuter trips starting with the largest commuter population. Strategies for this could include:
    - Informative flyers and seminars
    - A promotional event with discounted first year registration fees.
    - Organize a fleet of company rideshare vehicles.
    - Rideshare vehicles should meet sustainability standards
    - Rideshare vehicles should have full access to reserved parking spaces and reserved HOV lanes

5.1.2 Transit Pass Programs

The HRM has completed an Employer Transit Pass Pilot Project, which gives an EPass to employers. The EPass program is currently being reviewed within Metro Transit's 5 Year Strategic Operations Plan. This pass emulates the BC Transit ProPass program for employees. The ProPass is a permanent bus pass or a discounted monthly rate purchased by employees, which is deducted from their pay cheque monthly.

Another transit pass that has been implemented in HRM is the UPass. The UPass is a program, through Metro Transit, that gives full-time students from local colleges and universities a bus pass with unlimited access to transit services during the academic year.

Based on the existing conditions in HRM for transit and transit pass programs, recommendations and implementation strategies were created as 'next steps' for the municipality.

2.0 Recommended Strategies for Transit Pass Programs

ELEVATE IMPORTANCE, KNOWLEDGE AND AWARENESS OF TRANSIT PASS PROGRAMS WITH MAJOR STAKEHOLDERS

(a) Incorporate mandatory policy for transit pass facilities and programs in the workplace

- Transit pass programs, such as EPass, should be adopted by large employers
- Site design approval should be altered to require transit facilities if necessary

5.1.3 Carsharing Programs

Carsharing is an arrangement that allows individuals to gain the benefits of private vehicle use without bearing the full costs and responsibilities of ownership. Under carsharing a household or business has access to a fleet of shared vehicles on an as-needed basis. Liability and collision coverage is typically provided through the membership with regular maintenance administered by the company. The carshare programs that have been implemented throughout North America have made a significant difference in their communities taking a considerable number of cars off the road. For example, it was calculated that "each carshare network car removes 11 private cars from the road, [in Austin, Texas,] plus 12 more as members postponed new car purchases"[16].

Fleet Vehicles

The idea behind carshare cooperatives can be carried across to major employers in the form of fleet vehicles. Fleet vehicles are owned by a business or government agency, with the same intention, to reduce commuter trips in the workplace. For example, the Smart Car program initiated by HRM in 2009 provides vehicles to staff to use for meetings and is a good example of a fleet-operated workplace carsharing program.

[16] *Austin CarShare, Benefits of Carsharing, October 2009*

Based on the existing conditions in HRM for carsharing programs, recommendations and implementation strategies were created as 'next steps' for the municipality.

3.0	Recommended Strategies for Carshare Programs

UNDERTAKE A NEEDS ASSESSMENT AND DEVELOP A LONG RANGE PLAN

(a) Use results from needs assessment to develop a long range plan for carshare service in conjunction with HRM policies

(b) Work to include + support carsharing programs within HRM's TDM policies, including fleet vehicle programs

(c) Reserve public parking for carshare users

UPDATE PARKING TERMS + VARIANCES

(a) Re-evaluate parking variances with consideration for carshare programs

- As in the City of Vancouver, HRM should consider approximately sixty (60) multi-family residential units a suitable user population for one carshare vehicle. Parking variances should be considered where carshare vehicles are provided[17].

5.1.4 Park & Ride

Park & ride facilities are parking lots in strategic locations intended to facilitate ridesharing and transit use, to allow commuters to drive to and from these services in a convenient manner and then use sustainable modes such as transit, cycling, and rideshare, to reach their final destination. The HRM currently has approximately twelve (12) park & ride parking lots of which eleven (11) offer free parking for transit users.

Based on the existing conditions in HRM for park & ride, recommendations and implementation strategies were created as 'next steps' for the municipality.

[17] *Cohen et al, Carsharing: A Guide for Local Planners, June 2008*

4.0	Recommended Strategies for Park & Ride Programs

UNDERTAKE A NEEDS ASSESSMENT AND DEVELOP A LONG RANGE PLAN

(a) Review future park & ride locations based on the following variables:

- **Location** – locate sites in areas of high traffic, preferably along major roadways.
- **Function** – sites should have more than one use, multi-modal connections, and properly service an area with significant population.
- **Lot capacity** – ensure sites can accommodate parking demand.

ACCELERATE THE DEVELOPMENT OF INFRASTRUCTURE NEEDED TO SUPPORT REGIONAL PARK & RIDE ACTIVITIES

(a) Develop guidelines and standards for multi-modal infrastructure that supports park & ride such as pedestrian walkways, bicycle facilities, park & ride lots, crosswalks, and transit stops.

5.1.5 Public Bicycle System

Bikeshare programs are public-owned services that allow the community to access bicycles at a number of strategic locations. They provide affordable access to bicycles for, short distance trips (typically downtown areas), and provide further alternatives to motor vehicle travel. Various bicycle kiosk locations would be set up at strategic points throughout the downtown. People would then visit one of these locations, pay the toll fee for the amount of time they wish to use the bike, and ride the bike and drop it off at any of the stations depending on their travel destination. The pricing structure would be setup to encourage short-term use and station location would facilitate their use in combination with transit, walking, carpooling, and other alternative travel modes.

Based on the existing conditions in HRM for public bicycle systems, recommendations and implementation strategies were created as 'next steps' for the municipality.

5.0	Recommended Strategies for a Public Bicycle System

UNDERTAKE A NEEDS ASSESSMENT AND INCLUDE A LONG RANGE PLAN IN FUTURE PLANNING DOCUMENTS

(a) Review future public bicycle system locations based on the following variables:

- **Location –** locate sites in areas of high capacity short distance trips (typically downtown).
- **Function** – sites should have more than one use, multi-modal connections, and properly service an area with significant population.
- **Lot capacity** – ensure sites can adequately accommodate cyclists.

5.1.6 Priority Parking

Priority parking spaces are typically located in the most desirable, central locations and are reserved for specific vehicles that are participating in or supporting TDM initiatives. Priority parking is a TDM strategy that was included in the *HRM Parking Strategy* for expansion and prioritization of priority parking infrastructure in the region. The programs and services that qualify for reserved parking spaces include:

- EcoVehicle spaces for registered hybrid vehicles
- Carpool parking spaces reserved for carpoolers
- Vanpool spaces reserved for vanpoolers
- Micro vehicle spaces for SmartCars
- Motorcycle / scooter parking
- Carshare vehicles

Based on the existing conditions in HRM for priority parking, recommendations and implementation strategies were created as 'next steps' for the municipality.

6.0 Recommended Strategies for Priority Parking Programs

ADDRESS PRIORITY PARKING IN CONTEXT WITH PRICING AND SUPPLY

(a) Reserve the best parking spaces for vehicles that support TDM initiatives and sustainable travel characteristics.

(b) Create TDM incentives using parking as a tool, such as:

- Free or discounted parking for users of TDM programs/services, such as ridematching (i.e. carpools)
- Occasional parkers pass for users of TDM programs/services

(c) Meet with major employers about reserving private parking spaces for vehicles who exhibit sustainable travel characteristics.

5.2 Reserved Lanes

Reserved lanes, whether for buses, bicycles, or vehicles, which meet certain occupancy or operating standards, are intended to give priority to specific vehicles with a designated lane.

5.2.1 High Occupancy Vehicle Lanes

High occupancy vehicle (HOV) lanes are designated lanes for vehicles travelling with a prescribed number of passengers, usually two or more. They are designed to move prioritized vehicles through congested areas on large or busy roads. Buses have access to this lane even without passengers to help keep their schedules and maintain efficient and reliable service. Because HOV lanes are designed to save time and bypass traffic congestion, it encourages commuters to carpool, reducing the number of SOVs on the road.

HOV lanes are typically most effective on long sections of freeways where the leftmost travel lane is used. This allows HOVs to move into and out of the designated lane as needed without interfering with exiting and entering traffic. HOV lanes are not effective on short sections of arterial streets or on streets with frequent intersections, as all vehicles need access to all lanes to make the turning movements they require.

5.2.2 Other Reserved Lane Systems

Other reserved lane systems that are already in place in HRM are reserved bicycle and bus lanes. Bus lanes increase the efficiency of transit services by minimizing travel delays as a result of traffic congestion. Transit lanes can be long sections of lane dedicated to buses, or short sections to allow buses to "queue-jump". Buses can also bypass queues of through traffic by sharing a lane with free-flow turning traffic. Buses are exempted from the turning requirement and aided by transit-only signals at intersections. Even if buses can not be given a dedicated lane to travel in, their presence approaching an intersection can be detected and signal timing adjusted to favor them. Measures like this can be combined to create a "transit priority corridor" that will make bus travel more competitive with car travel and allow buses to meet their schedules more reliably even when levels of traffic congestion escalate.

Example of a bus using a right turn lane and a transit single to “jump” a queue.

Based on the existing conditions in HRM for reserved lane systems, recommendations and implementation strategies were created as ‘next steps’ for the municipality.

7.0	Recommended Strategies for Reserved Lane Programs

UNDERTAKE A REGION-WIDE ASSESSMENT OF THE POTENTIAL FOR RESERVED LANE PROGRAMS

(a) Develop a plan to establish transit priority corridors, particularly where regional express transit services will operate.

(b) Assess feasibility of HOV lanes

- Introduce a reserved HOV lane system, reserved for vehicles with two or more passengers and/or meet criteria for sustainable travel characteristics + support TDM initiatives.
- Implement a program to approve certain vehicles that meet a certain standard for low exhaust emissions to qualify for a sticker that allows the vehicle use of HOV lanes.

(c) Improve user information to explain regulations, function, and benefit of reserved lanes.

(d) Review existing conditions of reserved lane systems, such as bus lanes and bicycle lanes, periodically

5.3 Commuter Trip Reduction Programs & Services

5.3.1 Telecommuting (Telework)

Telecommuting is a practice that saves valuable time and increases productivity. When an employee works from home rather than commuting to an office or other workplace, commuting time and cost becomes non-existent. As not all jobs are suitable to this type of work environment, employers work with managers and employees to develop suitable telecommuting policies and practices. When employees are able to work alternative hours it reduces peak period commute travel. Staggering work schedules or condensing the work week also helps to accommodate ridesharing and transit use and enables employees to work from any location and live a greater distance from their place of work. Telecommuting can be full-time, part-time or occasional and typically occurs in one of the following locations:

- Home-based telecommuting allows employees to completely eliminate their commute trip by staying in their place of residence;
- Telecommuting from telecommuting centres, communication offices that are open to the public and can be used by various employers on a free-for-service basis; or
- Mobile telecommuting permits an employee to work from a variety of locations

5.3.2 Suburban Satellite Office Centers

Satellite office centers are detached office quarters away from a central, main office. A single employer/organization can have many offices located in close proximity or spread out across the globe. The key benefits associated with this approach are situating specialized offices in locations that are convenient or necessary for different fields of work, or in locations that reduce the length and number of commuter-trips required.

5.3.3 Flexible Work Hours

Incorporating flexible work hours as a TDM strategy allows employees to schedule their work days around convenient transportation schedules. This enables employees the freedom to work hours that are suitable to their individual mode choice. This freedom gives employees the incentive to use alternate modes without worrying about conflicting schedules or travel delays.

HRM has a trip reduction plan, Workplace Commuter Options, with commuter trip reduction strategies already in place in the municipality. Therefore, the following recommendations and implementation strategies are based on 'next steps' and further development of this plan.

8.0 Recommended Strategies for Commuter Trip Reduction Programs & Services

(a) Improve user information to explain regulations, function, and benefit of commuter trip reduction programs & services.

(b) Review existing conditions of commuter trip reduction programs & services systems, periodically

6.0 INFORMATION, MARKETING + OUTREACH

A TDM marketing strategy aims to influence individuals travel behaviour, to realistically determine user-friendly and viable non-driving alternatives. Because public opinion has a major effect on the travel patterns of individuals, it is important to properly market TDM strategies to better explain the benefits associated with TDM initiatives. Understanding the needs of the market, therefore, is the keystone to TDM implementation.

The importance of effective TDM marketing is paramount. A survey of commuters found that "exposure to commute trip reduction program information was the single most important factor contributing to mode shifting"[18] Therefore, the understanding between residents and the TDM plan should be done thoroughly and with great care. Once a sufficient understanding of the market has been obtained a range of TDM marketing activities can be presented, and subsequently the success of these should be monitored and evaluated so that future activities can be planned effectively.

Information, marketing and outreach strategies are considered in three (3) categories – tax reforms, monitoring and evaluating activities, and transportation management associations. Each is addressed in the following sections.

6.1 Tax Reforms

One of the greatest TDM challenges comes with altering pre-existing perceptions and habituated behavioural characteristics. Since fuel and vehicle costs do not accurately reflect the 'true cost' of vehicle-use, there is a lack of tangible evidence to support TDM arguments. The strategy to overcome this barrier is to alter perceptions by shifting taxes from socially positive activities to activities with external costs, such as the use of SOVs.

For example, in July, 2008, BC implemented a Carbon Tax, the first revenue neutral carbon tax in North America[19], which aimed to reduce climate change and conserve energy by taxing activities resulting in carbon emissions. More specifically, the carbon tax targets a number of fuels, with rates based on carbon content and quantity (per liter). Revealing the 'true cost' of travel creates an awareness of utilization that may otherwise not take place.

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[18] *Victoria Transport Policy Institute, Online TDM Encyclopedia*

[19] *Victoria Transport Policy Institute, Online TDM Encyclopedia*

Revenue from this tax can be used to reduce taxes on socially positive activities. Reducing tax on sustainable modes of transportation is perceived as a reward system for participants, which will generate a greater public awareness of TDM initiatives and alter perceptions to see these measures in a positive light. Although situations in North America are not as severe as they are in eastern Africa, a great example of the positive impact from tax reform stems from an advocacy group determined to alter perceptions of the bicycle. Seeing the bicycle as a vital tool for development, an advocacy group in Kenya and Tanzania convinced local governments to reduce to costs of bicycles. Kenya eliminated the import tariffs on bicycles, and Tanzania reduced the duty on bicycle tires. The result was extremely successful. The lowered bike prices enabled a more widespread bike ownership, and provided those without employment the opportunity to work as bike taxi operators[20]. A similar reduction in bicycle tariffs in Ghana, surged bike imports by one-thousand percent (1000%)[21].

6.2 Monitoring & Evaluating Activities

After implementing an effective TDM marketing strategy, a region-wide assessment should occur to measure levels of success and failure within the plan. This data will be quantified and analysed for use in future TDM plans. TDM plans should always be flexible and anticipate change in travel behaviour and demand. Quantifying data from previous plans helps make sense of these changes. Once data is organized and comprehensive, specific programs and services should be prioritized in order of importance in accord to their success.

6.2.1 Intelligent Transportation Systems

According to Intelligent Transportation Systems Society of Canada, the term intelligent transportation system (ITS) refers to the "integrated application of advanced sensor, computer, electronics, and communications technologies and management strategies to increase the safety and efficiency of the transportation system"22. ITS, then, is an integration of communication technologies that have been introduced to improve transportation operations. The need for ITS comes from the problems associated with traffic congestion. ITS operations are present in a wide-range of transportation systems technology that ranges from basic management systems such as car navigation, traffic signal control systems, and automatic number plate recognition or speed cameras to the more advanced applications that can integrate live data and feedback from a number of sources, such as parking guidance and information systems, and weather information. Some benefits of ITS, associated with TDM, include,

[20] *Victoria Transport Policy Institute, Online TDM Encyclopedia*
[21] *Victoria Transport Policy Institute, Online TDM Encyclopedia*
[22] *Intelligent Transportation Systems Society of Canada*

protecting the environment by improving the efficiency of existing transport infrastructure and helping to reduce traffic growth. A few of the following examples were given in the *Calgary, Intelligent Transportation Systems Strategies 2003-2013*, to illustrate the full range of use from ITS systems.

6.3 Transportation Management Associations (TMA)

A transportation management association (TMA) is an organization with the responsibility of initiating a region-wide effort to implement adopted TDM policies, ensure regional coordination and consistency, and increase public awareness of sustainable transportation. They are typically public-private partnerships supported primarily by businesses and local/regional governments within the area. A TMA action committee should be organized to synthesize various TDM strategies over all relevant areas. This committee, consisting of representatives of HRM as well as public and private entities, will help unify the municipality on TDM. Their duties will include improving user information, increasing effectiveness of TDM measures, and establishing benefits for employers as well as employees.

6.3.1 Appoint a TMA Action Committee

The TMA action committee will be responsible for facilitating regional coordination of TDM within all areas of the HRM. Working in cooperation with HRM staff, public organizations, private organizations, and major employers should also be a part of the committee and mandate to improve regional communication and coordination.

6.3.2 Examples of TMA Successes

Lloyd District TMA – Portland, Oregon (www.ldtma.com)

The Lloyd District is located across the Willamette River from downtown Portland, OR. Their TMA involves 69 member businesses with approximately 9,000 employees. This TMA was established in 1995, and from 1997 - 2005 the district has succeeded in reducing SOV trips by twenty-eight percent (28%), increased transit use by ninety-one percent (91%), and increased other transportation mode use as well. They have reduced approximately 1,000 daily peak period vehicle trips and have reduced approximately 3.9 million annual vehicle-miles[23].

[23] *Victoria Transport Policy Institute*

Cambie Corridor Consortium – Vancouver, British Columbia (www.toolsofchange.com)

The Cambie Corridor Consortium TMA strives to reduces SOV use and promote sustainable transportation modes to benefit the environment. The Cambie/Broadway area of Vancouver is the second largest business district within the city and has a myriad of businesses, shopping, and residential areas. The number of SOV trips made in the area has decreased 1.6 percent and transit use has increased by about twenty-five percent (25%) since 1994[24].

Based on the existing conditions in HRM for marketing and information systems, recommendations and implementation strategies were created as 'next steps' for the municipality.

9.0 Recommended Strategies for Marketing and Information

EXPLORE PRICING MECHANISMS TO ESTABLISH/INCREASE THE COSTS FOR PARKING

(a) Implement additional taxes for activities with an external cost, and dedicate new revenues to funding alternatives modes

- Address parking/policy/zoning/pricing connection in the context of external costs

(b) Improve TDM vision + knowledge and continue efforts to increase regional coordination

- Expand efforts to build interest and consensus with the region
- Appoint a TMA action committee with representatives from each department of HRM and give them the responsibility of facilitating regional coordination TDM projects with wide-spread planning and programming processes.
- Develop a regional communications strategy for sharing information, coordinating efforts and involving key public organizations, private organizations, and major employers.
- Expand TDM training and expertise
- Expand TDM information, guides and manuals
- Commit to high-priority HRM TDM needs assessment
- Undertake surveys and evaluations of all TDM activities and share results

[24] *Victoria Transport Policy Institute*

(c) Provide aggressive public education, marketing and advertising aimed at changing travel attitudes and behaviours

- Strengthen public education and awareness activities
- Set up a ten (10) to thirty (30) day trial period for residents to try various rideshare programs before committing
- Have a designated sustainable-travel-week emulating the bike-to-work-week event.
- Support province-wide efforts towards a "sustainable transportation choices" marketing campaign
- Incorporate educational activities and curriculum into the school system at all levels
- Encourage new technologies like ITS to influence travel behaviour and develop a regional ITS strategy
- Liaise with businesses through an existing chamber of commerce or public forum and identify their needs and preferences.
- Develop market research programs to gain insight into the region's travel behaviour and patterns.
- Maintain promotion and provide ongoing support for those using sustainable transportation modes or engaging in TDM strategies.
- Monitor and evaluate effectiveness of the regional TDM plan and its strategies through use of traffic count data and follow up surveys.

(d) Develop a single, integrated customer information system for all TDM services

Develop a website with access to all available TDM programs and services, both pubic and private.

7.0 SETTLEMENT + LAND USE PATTERNS

A critical relationship exists between land use and transportation. Well planned land use at the site and regional level enhances the attractiveness, convenience, and safety of alternative travel modes, while not compromising the efficiency of travel by other modes. Conversely, the provision of high-quality transportation options has significant influence over the travel choices of those impacted. An effective regional transportation system must link people and communities with each other and with the goods, services and employment opportunities they seek. It must offer a choice of interconnected travel modes and form a powerful tool for shaping future development. New investments in infrastructure and services must be strategically planned in conjunction with land use and coordinated with all levels of government.

Settlement and land use strategies are considered in three (3) categories – regional settlement, bylaw requirements, and development process. Each is addressed in the following sections.

7.1 TDM + Regional Settlement

Through the RMPS, the HRM has set forth a framework that allows residents to use alternative modes to the automobile, while recognizing its continued importance. Future settlement is to be divided as approximately twenty-five percent (25%) in the urban centre, fifty percent (50%) in suburban centres, and twenty-five percent (25%) in rural areas. Each of these centres is to be connected internally with high-quality pedestrian and cycling facilities, and between one-another with efficient transit service. This model is consistent with the objectives of Smart Growth and Transit Oriented Development (TOD) listed in the RMPS.

The role of TDM in each of these settlement areas is in the coordination of the various travel options provided.

7.1.1 Regional Growth Centers

The HRM Regional Plan puts forth a clear vision of future regional growth occurring in a series of concentrated regional growth centers, each served by higher-order transit and a variety of sustainable transportation options. The approach of increasing land use densities and creating community 'nodes' allows for the HRM to focus the provision of new transportation facilities in these areas, knowing that they will offer the greatest impact per dollar spent. It is recommended that HRM adopt a policy stating that transportation-related capital expenditures in regional growth centers identified in the Regional Plan are prioritized over those expenditures outside regional growth centers. This will ensure that as densities increase in these areas, sustainable transportation services will also improve.

7.1.2 Location-Efficient Mortgages

Location-efficient mortgages allow homebuyers to qualify for higher loan amounts in areas with higher density and greater transportation mode choice, recognizing that residents living in these areas spend less income on transportation costs because they are more likely to use sustainable travel modes. This mortgage strategy has the potential to make higher-density projects more acceptable to lenders and establish a financial disincentive to unsustainable settlement patterns, promote higher densities, and facilitate increased use of alternative transportation modes. HRM should determine any assistance it can provide to encourage establishing a location-efficient mortgage program within the region, even if it requires a comprehensive approach at the national level through ACT Canada.

Based on the existing conditions in HRM for settlement and land use patterns, recommendations and implementation strategies were created as 'next steps' for the municipality.

10.0	Recommended Strategies for Settlement and Land Use Patterns

DEVELOP A LONG RANGE PLAN THAT CONSIDERS A COMPREHENSIVE STRATEGY FOR SETTLEMENT AND LAND USE

(a) Create a holistic strategy with TDM initiatives of the HRM and major development and infrastructure systems in the region

7.2 Land Use Bylaw Requirements

HRM's land use bylaws setout requirements for the development of properties within various plan areas. Each plan area has its own bylaw, but the requirements found in each are relatively consistent with one another. It is recommended that HRM amend each of its land use bylaws to include considerations for bike parking, priority parking, and cash in lieu of parking.

7.2.1 Bike Parking

An important provision for those who cycle and others who might consider cycling is access to convenient, appealing, and secure bicycle parking. Bicycles can be expensive and are often vulnerable. Inferior racks or poor site planning can expose bikes to theft, vandalism or damage and discourage cycling.[25] Certain developments recognize the value of providing bicycle parking as part of their new

[25] *Capital Bike and Walk Society, Bicycles at Rest, p.1*

development, but not all. There is no assurance that adequate bicycle parking will be provided as part of any new development without a land use bylaw requirement. HRM currently has bicycle parking requirements in some of their land use bylaws, but not all. See *Table 1*. The HRM should consider amendments to ensure that all land use bylaws include bicycle parking requirements.

Table 1. Bike Parking Requirements in HRM Land Use Bylaws

Plan Area	Bike Parking Requirement?
Beaver Bank, Hammonds Plains, and Upper Sackville	No
Bedford	Yes
District 5 (Chebucto Peninsula)	Yes
Cole Harbour / Westphal	Yes
Eastern Passage / Cow Bay	Yes
Dartmouth	Yes
Downtown Dartmouth	Yes
Eastern Shore (east)	No
Eastern Shore (west)	No
Halifax (mainland)	Yes
Halifax (peninsula)	Yes
Downtown Halifax	Yes
Districts 8 & 9 (Lake Echo / Porters Lake)	No
Lawrencetown	No
Musquodoboit Harbour / Dutch Settlement	No
N. Preston, Lake Major, Lake Loon, Cherry Brook, E. Preston	No
Planning District 4 (Prospect)	No
Sackville	Yes
Sackville Drive	Yes
Districts 14 & 17 (Shubenacadie Lakes)	No
Districts 1 & 3 (St Margaret's Bay)	No
Timberlea / Lakeside / Beechville	Yes

The type and quantity of bike parking provided is important. Class A bicycle parking facilities provide restricted access and weather protection and is used for long-term parking at multi-family residential sites, workplaces, academic institutions, and other destinations with long-term parking demand. Class B bike parking are freestanding racks in public spaces intended for short-term parking.

Examples of Class A Bike Parking (left) and Class B Parking (right).

HRMs bike parking requirements are consistent in each of the Plan Areas that include bike parking requirements. See *Table 2*. This fails to account for variations in cycling demand experienced in an urban setting versus a rural setting. It is suggested that the higher densities and mixing of land uses experienced in urban areas leads to increased cycling.[26] This should be reflected in bike parking requirements.

Table 2. Existing HRM Bike Parking Rates

Use	Requirement
Multiple Use Dwelling	0.5 spaces per dwelling unit, 80% Class A, 20% Class B
Hotels / Motels / Inns	1 space for every 20 rooms, 80% Class A, 20% Class B Minimum 2 Class B spaces
General Retail, Trade and Service, Food Store, Shopping Centre, Restaurants	1 space per 300m² GFA, 20% Class A/ 80% Class B Minimum 2 Class B spaces

[26] *Pucher & Buehler, p268.*

General Office, Banks, Medical Clinics, Institutional Uses, Government Buildings	1 space per 500m² GFA, 50% Class A/ 50% Class B Minimum 2 Class B spaces
Auditoriums, Theatres, Stadiums, Halls	1 space for every 20 seats, 20% Class A/ 80% Class B Minimum of 2 Class B spaces, Maximum of 50 spaces
Schools, Colleges, Universities	1 space for every 250m² GFA, 20% Class A/ 80% Class B
Recreation Facilities, Community Centres, Libraries	1 space per 200m² GFA, 20% Class A/ 80% Class B Minimum of 2 Class B spaces
General Industrial Uses	1 space per 1000 m² GFA, 80% Class A/ 20% Class B Minimum of 2 Class B spaces, Maximum of 20 spaces
Commercial Parking Structures/Lots	5% of motor vehicle parking provided, Minimum of 2 Class B spaces, Maximum of 50 spaces
Uses Not Specified Above	1 space per 500 m² GFA, 50% Class A/ 50% Class B

HRM should establish bike parking requirements that are specific to the context in which they are applied. Three (3) rates are suggested – urban, suburban, and rural. Urban rates should be higher than suburban rates, and suburban rates should be higher than rural rates. HRM should undertake a detailed assessment of bicycle parking rates to determine appropriate urban, suburban, and rural rates. It is suggested that urban rates are raised from existing rates, particularly the multi-family and school/university rates. Suburban rates may remain similar to existing rates, and rural rates should include minimal requirements for multi-family residential, schools/universities, retail, and office land uses.

Urban rates should be applied to Halifax (peninsula) and Downtown Dartmouth. Suburban rates should be applied to Halifax (mainland), Dartmouth, Bedford, Sackville Drive, Sackville, Cole Harbour / Westphal, and Eastern Passage / Cow Bay. All other plan areas should use rural rates.

7.2.2 Priority Parking

Priority parking spaces, as described in Section 5.1.6, are those typically in the most sought after locations that are reserved for users who require them or for users who exhibit travel behaviour that the local government wishes to reward. It is recommended that HRM explore opportunities to include bylaws requirements for priority parking spaces that encourage use of more efficient vehicle types.

7.2.3 Cash In-Lieu of Parking

The Nova Scotia Municipal Government Act (MGA) is the legislation permitting HRM to enact bylaws regulating land use. The MGA grants HRM the power to both require minimum parking requirements in all new development, as well as accept a monetary contribution in-lieu of each required parking space not provided. All in-lieu funds must be used to fund parking or transit infrastructure in the vicinity of development site. While the Provincial legislation is in place to allow cash in-lieu, HRM currently does not accept cash in-lieu. It is recommended that HRM establish policies and a bylaw to begin accepting cash in-lieu of parking as a means to acquire funds to put toward more efficient public parking supply and transit improvements.

HRM currently has no minimum off-street parking requirement for any new community development on the Halifax Peninsula. This does not allow for cash in-lieu contributions. HRM may consider revising the zero parking requirement for the Peninsula so that they may accept cash in-lieu contributions.

In British Columbia, the Local Government Act (the equivalent of Nova Scotia's MGA) was updated in 2008 to permit local governments to use cash in-lieu funds toward "transportation infrastructure that supports walking, bicycling, public transit or other alternative forms of transportation"[27] HRM should work with the Province to amend legislation so that they may expand the range of transportation improvements that may be funded using cash in-lieu contributions to include pedestrian, cycling, ridesharing and other programs in support of TDM.

Based on the existing conditions in HRM for land use bylaw requirements, recommendations and implementation strategies were created as 'next steps' for the municipality.

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[27] *British Columbia Local Government Act, Section 906.7*

11.0	Recommended Strategies for Land Use Bylaw Requirements

EVALUATE AND UPDATE BYLAWS

a) Update and develop new bylaws that encourage TDM initiatives

- Develop bylaws that reward actions with low external costs. For example, bylaws could require a certain number of priority parking spaces be reserved for vehicles that meet emission and efficiency standards
- Adopt new bylaws that require new developments to include supporting TDM infrastructure

7.3 Development Process

There are opportunities in the development process for both HRM and private land owners to benefit from the provision of TDM strategies aimed at improving alternative transportation.

7.3.1 Development TDM Contributions

The provision of transportation options and supporting services can be provided in a better coordinated and more comprehensive fashion when provided as part of a regional effort, rather than on a site-by-site basis. HRM should work with all new development to seek TDM considerations in their development and, whenever possible, encourage TDM to be administered as part of a regional service.

As was identified in Section 6.0, HRM should establish a regional TDM coordination function. As new land development proposals arise, HRM should work with developers to channel TDM concessions through the regional service, rather than provide it by themselves. This will ensure that services are provided in a coordinated fashion, taking into account opportunities to partner with nearby programs and services. It will also ensure that contributions toward TDM programs are used in the most effective way possible, addressing region-wide objectives, rather than site-specific ones.

Cash in-lieu contributions must be used to fund physical infrastructure, so there is no opportunity to use these funds to finance TDM programs and services. However, HRM should consider other opportunities to reward developers who wish to make TDM contributions above-and-beyond their requirements. HRM may consider TDM contributions as grounds for a parking variance where it can be shown that TDM will reduce on-site parking demand. TDM contributions may also be used as ground for density bonuses or relaxations on other required elements.

7.3.2 Development Review Process

There are opportunities in the development review process for HRM to ensure that all development proposals include site design that will encourage sustainable transportation. The Institute of Transportation Engineers' *Promoting Sustainable Transportation through Site Design* is a guidance document that recommends site design practices that can be applied through the land development process to promote the use of more sustainable modes of passenger transportation, such as walking, cycling, and transit.

As part of the development of this TDM plan, a workshop was held with HRM staff from a variety of departments and with land developers from the community. There was clear support for this ITE document, especially with staff, suggesting that formally recognizing this document would provide more transparent principles to follow in site design. Both parties suggested this would more clearly define expectations of land developers, and make communications and critiquing site designs easier. HRM should consider formally adopting the ITE Site Design guide to convey site design expectations to developers and as a guide by which HRM staff can evaluate development proposals.

As part of the same workshops, the *Greenmodes* software application was introduced. Greenmodes is the software that applies the ITE Site Deisgn guide. Its power is as a collaborative development review application that coordinates a number of users into a single system, making clear the responsibilities of each and providing for coordinated outcomes. General feedback from the workshops was that Greenmodes is something that would be a valuable review tool for staff and would be a useful process for developers to help clarify HRM expectations in their projects. As the software can be customized, there may be need to broaden the scope of the guideline prompts to include elements other than sustainable transportation considerations.

12.0 Recommended Strategies for Land Use + Development Processes

INCORPORATE LAND USE WITH REGIONAL DEMAND MANAGEMENT

(a) Develop new directions for comprehensive planning, land use and site planning to emphasize TDM strategies, easy access to transportation services and reduced travel in SOV.

- Amend land use, zoning and regulations to emphasize the ability and responsibility to strengthen the link between land use/site planning and the use of alternative modes.
- Revise project design, review and approval processes to ensure that adequate TDM strategies are included in all new development projects
- Require specific TDM components in every comprehensive plan and study by working through existing groups and established processes
- Develop guides for local jurisdictions to provide information on TDM strategies and to spotlight the best practices underway in HRM

8.0 SINGLE-OCCUPANT VEHICLE (SOV) DISINCENTIVES

The fundamental objective of the TDM Functional Plan is to outline strategies to influence travel behaviour to facilitate increased use of alternative transportation modes. To this point in the Plan, strategies are outlined which provide direct incentives to travel by alternative modes. However, this section identified disincentives that may be applied to SOV travel to encourage travel by alternative modes.

It should be clarified that the overall objective of this plan is to improve mobility. This section does not seek to simply decrease SOV mobility, rather it seeks to provide strategies that limit SOV mobility relative to sustainable travel options. This means that for each SOV disincentive, there is a corresponding improvement to sustainable options.

Disincentive options have been divided among three (3) categories:

- Congestion
- Pricing
- Infrastructure

8.1 Congestion

In transportation systems, congestion is typically seen as a negative condition and something that TDM strategies seek to relieve by shifting automobile trips to alternative modes. However, the presence of congestion also promotes alternative travel modes by making them more time-effective and convenient relative to SOV travel. In this sense it is important that congestion levels are balanced with a tolerance for a certain level of inconvenience to ensure both effective operations and encouragement of sustainable travel modes.

One method by which HRM can use congestion to help facilitate increased use of sustainable travel modes is to set transportation congestion threshold objectives for all future planning and development in Halifax. Two (2) types of congestion are considered in the following sections – traffic and parking.

8.1.1 Traffic Congestion

Traffic congestion is a condition experienced in a road network once a specific threshold is exceeded, often characterized by slower speeds, longer trip times, and increased queue lengths. This adds inconvenience to a vehicle trip and as congestion increases, SOV users are more likely to shift to sustainable travel modes. To relieve traffic congestion either new roads are needed to more effectively shift traffic across the network or incentives are provided to shift travel to alternative modes to reduce

the number of vehicles on the roadway. The latter is the approach that HRM should pursue in addressing the objectives of the RMPS and this plan.

The need to add capacity for vehicular traffic is assessed using screen lines and volume-capacity ratios. A screen line is an imaginary line with a limited number of locations where it can be crossed by vehicle. Capacity is the measure of how many vehicles can physically be accommodated by the traffic lanes provided. Vehicles normally exhibit flexibility in where they cross a specific screen line based on where delay is the least and, for that reason, capacity of the entire screen line is considered instead of capacity at individual crossing locations.

Screen lines are monitored to determine what the volume of vehicle demand is compared to the capacity that is available. A volume-to-capacity ratio of 1.0 is an indication that the capacity of roadways crossing the screen line is equal to the volume of traffic wanting to cross. Even at a ratio of 0.8, traffic congestion and delay is evident. When demand exceeds capacity, congestion and delay increases dramatically.

The Road Network Functional Plan projects future vehicle demand and identifies roadway capacity projects needed to maintain a volume-capacity ratio of 1.0 at all screen lines. Clearly, implementation of TDM measures aimed at reducing vehicles demands can have an effect on the timing of, or even the need for, roadway capacity projects.

8.1.2 Parking Congestion

While transportation-related congestion strategies often refer only to traffic congestion, parking congestion is another approach to limit SOV travel. Parking congestion works on the premise that restricting parking so that it is not plentiful and induce a certain level of inconvenience in finding an empty space will cause a certain portion of users to shift to alternative travel modes to realize increases in convenience. Not only will fewer vehicles be on the road, but additional property in some of the most sought after locations will be freed for better uses. Parking congestion levels should be contemplated which are practical. They must be set so they retain the economic viability of commercial areas, the liveability of residential areas, and the general functioning of downtown and suburban areas.

Parking congestion is measured by the portion of a given parking supply that is occupied at a given time, referred to as the “occupancy rate”. The time of the day when occupancy rates are highest is referred to as the peak hour, and the time of the year when occupancy rates are highest is the annual peak period. As with traffic analysis, parking assessments typically seek to ensure annual peak parking

demand period is met so that all vehicles may be accommodated at all times. The problem with this is that during all non-peak periods, the parking supply will exceed parking demand. As an example, shopping centre customer parking generation rates for January are fifty-seven percent (57%) of the December rates[28]. In this scenario, if parking supply is provided to meet demand in the peak period, it will sit approximately fifty percent (50%) unoccupied during the January peak period and even less occupied during non-peak periods.

HRM should take actions to ensure that future parking supplies more accurately reflect demand. The parking requirements set out in HRM land use bylaws should be objective in requiring that new development provide a combination of parking and cash in-lieu that ensures an appropriate supply is provided. It is also important that standards include maximums so there is a upper cap on the number of parking spaces that may be provided. A parking cap is especially important for commercial-retail land use, where retailers often seek increased supply. Parking maximums are often expressed in a land use bylaw as a percentage of the minimum requirement. The City of Kelowna, as an example, requires that no more than 125% of the minimum parking requirement is supplied in downtown development.[29]

HRM should also require development proposals above a certain threshold (either no. units or GFA) to undertake a parking demand assessment to determine parking demand trends. These studies should seek to provide the necessary parking supply to achieve an eighty-five percent (85%) occupancy rate for the annual eighty-five-percentile demand period. In cases where parking demand is expected to exceed supply during the annual peak period, contingency strategies should be developed to reduce demand during these specific periods.

8.2 Pricing

The direct cost that an individual bears in meeting their personal travel needs rarely reflects the true cost imposed on the community. SOV travel is the most expensive travel mode to a community, as it requires publicly-funded roadways, traffic control, parking areas, and places the greatest strain on the environment and public safety. Yet, public funds continue to be used to develop and maintain automobile-oriented infrastructure.

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[28] *Smith, Shared Parking, p. 14.*

[29] *City of Kelowna, Zoning Bylaw no.800, accessed at http://www.kelowna.ca/*

HRM should seek to establish pricing strategies that begin to shift public costs back to the individual SOV user to facilitate increased use of alternative modes. Three (3) pricing strategies are explained in the following section that will help shift the cost of driving back to drivers - road tolls, congestion pricing, and parking pricing.

8.2.1 Road Tolls

Road tolls are typically employed as a way to recoup the costs of expensive infrastructure improvements, such as a highway or bridge, with costs structured to maximize revenues and success measured in terms of cost recovery. MacDonald Bridge is an example of a typical toll route in HRM. Alternatively to cost recuperation, tolls can also effectively influence travel behaviour, adding a tangible cost that can be used as a disincentive for driving.

8.2.2 Congestion Pricing

Congesting pricing is a system where vehicles are charged to travel along specific routes or into specific areas during the day with varying rates, which depend upon the time of day. Prices are typically increased when congestion is highest and decreased during off-peak times. Prices usually apply only to enter the centre of a city or along congested routes. Congestion pricing provides the benefit of discouraging SOV travel in favour of carpooling and other alternative modes, resulting in reduced congestion in some of the most congested areas and a marked shift in travel behaviour. Congestion pricing revenues can also be used to help fund alternative transportation infrastructure.

The most wide-spread example of congestion pricing is in central London, UK, where Mayor Ken Livingston introduced congestion pricing to an eight (8) kilometer central area to alleviate weekday traffic congestion and raise funds for transportation improvements. There was strong initial opposition to the proposal. However, congestion pricing has substantially reduced traffic congestion, improved transit service, and has proven successful in generating funds for transportation improvements. Mayor Livingston was re-elected one (1) year after introducing the congestion pricing program, largely due to its success.[30]

[30] *VTPI, Road Pricing, http://www.vtpi.org/tdm/tdm35.htm.*

A congestion pricing system would be a major undertaking in HRM, one with considerable political implications. However, as a means to discourage SOV travel within the Region, it would likely prove quite successful. Such a system could be applied to all vehicles that enter the Halifax Peninsula as a means to ease downtown congestion. It could also be applied along outlying corridors experiencing significant congestion. Variable costs could be put in place to discourage travel during peak periods.

8.2.3 Parking Pricing

Parking is usually put in place to cover the costs of operations, fund new parking facilities, and pass the cost of parking in premium spaces onto the individual, rather than the community. However, priced correctly and coupled with appropriate alternatives, it can be used to shift travel demand from SOVs to alternative modes. A survey of HRM residents suggested that, of the respondents who commute by automobile and have access to free parking at their destination, seventeen percent (17%) would shift to an alternative travel mode if parking was no longer free, and another twelve percent (12%) would shift modes if parking was sufficiently priced. Additionally, public consultation indicated that the community is supportive of higher parking prices and parking restraint policies as long as these were coupled with improvements to alternative travel options.[31]

The Regional Parking Strategy Function Plan suggests three (3) key principles should be followed in considering appropriate parking fees:

- The most convenient parking spaces, typically on-street spaces close to building entrances, should be priced higher than surrounding off-street lots to promote regular turnover;
- To help achieve TDM objectives, the monthly cost of parking should exceed the cost of a monthly transit pass; and
- On-street parking should be priced to achieve eighty-five percent (85%) occupancy to reduce the need to cruise for parking and improve the parking experience for motorists, especially in downtown areas.

[31] *Stated in the Regional Parking Strategy Function Plan*

8.3 Infrastructure

Conventional transportation infrastructure design has centred on facilitating safe, efficient vehicle travel above all else. This has resulted in a network that emphasizes motor vehicle travel and provides for sustainable transportation infrastructure as an afterthought. However, under the direction of the RMPS and the subsequent network plans, HRM is seeking to shift the emphasis of infrastructure design toward sustainable modes, to make provisions for safe, efficient and comfortable travel for all vehicle users. Existing network plans include the following:

- Active Transportation Plan
- Regional Parking Strategy Functional Plan
- Blueprint for a Bicycle Friendly HRM – Halifax Regional Municipality Bicycle Plan
- HRM Regional Transit Plan – Park & Ride, Express and Rural Transportation Services
- HRM Road and Road Network Plan

Beyond those plans highlighted above, it is recommended that HRM adopt policies for complete streets and car-free zones as a way to gradually shift infrastructure design to better encourage alternative modes. Each is addressed in detail below.

8.3.1 Complete Streets Policy

The 'complete streets' philosophy is based on the idea that streets should be designed to permit equally safe and convenient access for all travel modes. Pedestrians, bicyclists, motorists, and public transportation users of all ages and abilities are able to safely move along and across a complete street. Creating complete transportation systems requires a change in focus from designing roadways to accommodate vehicles, to considering roadways as a fundamental piece of the public realm, one that is to be used by everyone for equal utility. Communities with complete streets consist of streets and roads that work for drivers, transit users, pedestrians, and bicyclists, as well as for older people, children, and people with disabilities.[32]

HRM should consider adopting a complete streets approach in the planning and design of all future roadway projects. This approach should consist of two (2) elements. First, HRM should consider adopting a complete street policy. The policy would be a high-level statement outlining and defining the communities intention to approach all future roadway projects from a complete streets perspective. The policy should outline the types of projects that must adhere to the complete street policy, as well as the types of users that are to be considered in each project. Secondly, HRM should consider

[32] *Based on National Complete Streets Coalition, "What are Complete Streets?", http://www.completestreets.org/*

developing a Complete Streets Design Guide to identify and formalize the elements of complete streets and to provide guidance on how to incorporate complete streets elements into conventional roadway designs standards. The Institute of Transportation Engineers' *Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities* is a good source for design guidance. HRM might also consider using the *CompleteStreetsLOS* software application in assessing potential impacts of roadway design options.[33]

13.0 Recommended Strategies for SOV Disincentives

RAISE ACCEPTABLE CONGESTION IN EXCHANGE FOR DEVELOPER CONTRIBUTIONS TO TDM PROGRAMS

DEVELOP FINANCIAL DISINCENTIVES TO DRIVING ALONE AND INCENTIVES FOR USING SUSTAINABLE MODES.

(a) Investigate pricing tools that more accurately reflect the true costs of transportation

(b) Promote incentives for employers who undertake TDM activities

- Promote travel allowance programs
- Develop incentive programs to match employers' expenses for parking cash-out programs

[33] *Information available at http://www.dowlinginc.com/CompleteStreetsLOS.php*

9.0 IMPLEMENTATION STRATEGY

9.1 TDM Action Items

This plan contains an extensive list of recommended action items for HRM to consider in working toward realizing the objectives of this plan. The following is a summary of each of the action items identified in this plan.

Table 3: Summary of Recommended Strategies

#	Item	Recommended Strategy
1.0	**Ridesharing**	Aggressively expand both public and private ridesharing throughout the HRM
2.0	**Transit Pass Programs**	Elevate importance, knowledge and awareness of transit pass programs with major stakeholders
3.0	**Carshare Programs**	Undertake a needs assessment and develop a long range plan
4.0	**Park & Ride Programs**	Undertake a needs assessment and develop a long range plan Accelerate the development of infrastructure needed to support regional Park & Ride activities
5.0	**Priority Parking**	Address priority parking context with pricing and supply
6.0	**Public Bicycle Systems**	Undertake a region-wide assessment of the potential for reserved public bicycle systems
7.0	**Reserved Lane Systems**	Undertake a region-wide assessment of the potential for reserved lane programs

8.0	**Commuter Trip Reduction Programs**	Review and improve existing conditions of the Workplace Commuter Options plan
9.0	**Marketing and Information**	Explore pricing mechanisms to establish/increase costs for parking
10.0	**Settlement + Land Use Patterns**	Develop a long range plan that considers a comprehensive strategy for settlement and land use
11.0	**Land Use Bylaw Requirements**	Evaluate and update bylaw requirements
12.0	**Development Processes**	Incorporate land use with regional demand management
13.0	**SOV Disincentives**	Raise acceptable congestion in exchange for developer contributions to TDM program Develop financial disincentives to driving alone and incentives for using sustainable modes

9.2 Performance Evaluation

Performance evaluation refers to an on-going monitoring process to determine how well policies, programs, and projects are performing with regard to their intended goals. Two evaluation approaches are recommended: mode split and individual TDM measure performance evaluation. Each of these are detailed below.

9.2.1 Mode Split

Typically, transportation performance evaluation is measured by the modal split or mode share, which is the percentage of person-trips made by one travel mode, relative to the total number of person-trips made by all modes. As an example, if twelve percent (12%) of all region-wide trips are made by transit, then transit's mode share is twelve percent (12%). See *Table 4*. It is recommended that HRM set mode share targets as broad community objectives so that they can quantify successes and failures in pursuit of regional objectives.

Table 4. HRM Mode Split, 2001-2006

	Driver	Passenger	Transit	Walk/Bike	Other
2001	68%	10%	10%	11%	1%
2006	65%	11%	12%	12%	1%
Change	-3%	+1%	+2%	+1%	0

9.2.2 TDM Performance Evaluation

While a modal split approach to monitoring the effectiveness of transportation planning efforts will indicate broad successes and failures, it will not account for the successes or failures of the individual TDM strategies identified in this plan. It is suggested that, in addition to the mode split approach, HRM undertakes a quantity-based evaluation approach specific to TDM. This approach should quantify the total number of users associated with each TDM initiative. Performance evaluation should involve the following steps:

- **Establish:** Set a communications protocol to facilitate easy transfer of information for each TDM program that is to be evaluated. Usership quantities should be established for each TDM program that currently exists. See *Table 3*.

- **Target:** Set annual usership targets for existing TDM programs and for new TDM programs as they are established. Targets may be revisited over time.

- **Monitor:** Undertake annual monitoring by obtaining up-to-date usership quantities using the communications protocols established. Changes in usership should be tracked and successes/failures in achieving usership targets should be published. Year-by-year, targets may need to be adjusted.

9.3 Comprehensive Implementation Approach

The TDM Functional Plan is one (1) of five (5) functional plans that comprise the Transportation Master Plan. Each functional plan was developed independent of one another, but under shared objectives and with inter-related outcomes. It is necessary to rationalize the outcomes of each plan relative to one another to determine where action items overlap and how they should be prioritized relative to the overall objectives of the Regional Plan and Transportation Master Plan.

Accordingly, it is recommended that HRM develop an Implementation Strategy for the Transportation Master Plan. The Comprehensive Implementation Strategy should include the following:

- A summary of all recommendations and action items from the Active Transportation Plan, Public Transit Plan, Regional Parking Strategy, the Road Network Plan, and the TDM Function Plan.
- Assessment of where the outcomes of each functional plan overlap and where they may be addressed concurrently with one another.
- Policy-oriented recommendations from each functional plan and identification of the mechanisms/documents to bring forward new policies.
- Identification of all future infrastructure improvements identified in the functional plans, establish priority rating in consideration of one another, and determine overlap in geography or proposed timing.
- Capital projects checklist to ensure each new project is consistent with the objectives of the functional plans and with one another.
- Multi-modal consideration for development reviews and approvals.

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TERMINOLOGY

Beside the acronym itself, there are a number of transportation demand management (TDM) terms used throughout this document that may not be commonly understood. The following terms are defined for the purposed of this document.

Active transportation: Any form of self-propelled (non-motorized) transportation that relies on the use of human energy such as walking, cycling, inline skating and jogging

Alternative transportation/modes: Alternatives to travelling by single-occupant vehicle.

Area traffic management: Processes and techniques to preserve neighbourhood liveability by mitigating undesirable effects of vehicle travel including excessive volumes and speeds, aggressive driver behaviour and the creation of unfavourable conditions for walking and cycling

Barrier-free: A design characteristic that maximizes accessibility for persons with disabilities

Bus rapid transit (BRT): Fast, frequent, limited-stop bus service that operates within an exclusive right-of-way or with priority measures over mixed traffic in shared corridors

Carpool: An informal arrangement when two (2) or more individuals share a single vehicle trip.

Carpool lanes: A roadway lane dedicated for use by carpools (i.e. vehicles meeting minimum occupancy criteria, usually two or three persons) and buses, that may be open to mixed traffic at some hours of the day or days of the week, and that may also be open to other vehicles such as taxis or bicycles

Cash-in-lieu of parking: A practice permitting developers to pay a charge in lieu of constructing the minimum parking spaces required by zoning regulations, thereby financially enabling the provision of City-owned public parking facilities or infrastructure for alternative modes.

Complete streets: An approach to roadway planning and design that emphasizes equal safety and convenience for all travel modes, giving specific consideration to pedestrians, cyclists, transit, and other alternative modes where conventional roadway design often excludes them.

Guaranteed ride home: A program that ensures commuters who travel by alternative modes have access to a ride home in case of emergency.

Level of service (LOS): An indicator of the quality of operating conditions that may be applied to cycling or walking facilities (to reflect connectivity, convenience and comfort), transit service (to reflect speed, reliability and frequency) or roadways (to reflect the ratio of vehicle demand to roadway capacity, and resultant delay)

Liveability: The general term used to define the living conditions of a community, typically based on a wide range of criteria – safety, environment, health, recreation, economic viability, hygiene, culture, history, public transport, and so on.

Mixed use: Settlement patterns where a number of different land uses are arranged in close proximity.

Modal share/split: The percentage of person-trips made by one travel mode, relative to the total number of person-trips made by all modes

Multi-modal: Refers to facilities or trips that incorporate more than one (1) mode of transportation.

Multi-use pathways: Off-road facilities for travel by walking, cycling and other modes such as in-line skating, that serve both recreational and utilitarian travel needs

Park & ride lots: Parking lots, usually located at rapid transit stations, that allow automobile users to transfer to and from transit service in a convenient manner

Peak hour: The hour of greatest person-trip demand within a given peak period

Peak period: A period of high person-trip demand on weekday mornings and afternoons, generally measured as two hours long in the morning and two-and-a half hours in the afternoon

Rapid transit: Fast, frequent, high-capacity transit service provided using either bus or rail technology, operating in an exclusive right-of-way or otherwise undelayed by mixed traffic in shared corridors

Ridesharing: Shared use of a motor vehicle by two or more persons to make a trip, when they would otherwise travel separately

Single-occupancy vehicle (SOV): Any vehicle travelling with only one (1) occupant.

Telework / telecommute: Arrangements where employees work from home, eliminating the need to travel to their usual place of employment.

Transit-oriented development (TOD): Settlement patterns that seek to encourage use of transit, typically through increasing density, mixing land uses, and providing safe, appealing pedestrian conditions.

Transit priority measures: Strategies to increase transit operating speeds and transit travel time reliability in mixed traffic, such as traffic signal priority or queue jumps

Transportation demand management (TDM): Strategic initiatives that improve the efficiency of the transportation network, encouraging alternatives to single occupant vehicle trips and encouraging behavioural change. Initiatives include policies, programs, services and products to influence whether, why, when, where and how people travel.