Appendix B:
Background Information

B1: Review of Policy and Strategic Directions
B2: HSR Operational Review Summary
B3: Background Paper on the Intersection of Transportation and Health
Appendix B1
Review of Policy and Strategic Directions

A. National and Provincial Policy and Strategic Directions

Transit Vision 2040

CUTA Transit Vision 2040 defines a future in which public transit maximizes its contribution to quality of life with benefits that support a vibrant and equitable society, a complete and compact community form, a dynamic and efficient economy, and a healthy natural environment. Vision 2040 communicates transit’s contribution to quality of life, the nature of change likely to take place in our community by 2040, the implications these changes will have for transit, and strategic directions for actions that can maximize transit’s contribution to our quality of life. This Vision is based on current trends and the wisdom of stakeholders both inside and outside the transit industry. Transit is widely recognized as an important part of the solution to national challenges such as climate change, public health, economic development, and safety and security. On September 29, 2009 Council endorsed the following:

Transit Vision 2040 (PW09081) (City Wide) (Item 7.2)

(a) That the Canadian Urban Transit Association (CUTA) - Transit Vision 2040 (6 Focus Areas and 27 Strategic Directions), as identified in Appendix “A” attached hereto, be endorsed;

(b) That the Transit Division Operations Plan strategic initiatives that support Transit Vision 2040, Council’s Strategic Plan, Public Works Business Plan, Transportation Master Plan, and the Transit Division Ridership Growth and Asset Management Plan, as identified in Appendix “A” attached hereto, be endorsed.

The Big Move (2008)

In 2008, Metrolinx released the “The Big Move”, a Regional Transportation Plan (RTP) for the Greater Toronto and Hamilton area (GTHA). Increasing transit and access to transit is a primary focus of the (RTP). The plan outlines priority areas for future and existing transit. The RTP identified new rapid transit lines for Hamilton running east-west and north-south in the City, coinciding with the corridors identified in Hamilton’s new Urban Official Plan. The Big Move was directed in part by several ‘green papers’ highlighting best practices in various aspects of transportation planning. One of these papers focused on the integration between land use and transit. To facilitate development of transit in GTHA the Big Move highlights the need to integrate transportation and land use. Further more, the Plan itself conforms to and implements many provincial land use related policy documents such as the Provincial Policy Statement 2005 and the Growth Plan for the Greater Golden Horseshoe.

The Big Move is a regional transportation plan that contains multi-modal solutions such as rapid transit, road and highway projects for the greater Toronto and Hamilton area (GTHA). It includes a $50 billion capital expansion plan and the Province of Ontario has, to
date, committed $9.5 billion to support implementation of the first phase of the plan. Metrolinx is currently developing an investment strategy to identify methods to further funding of the proposed infrastructure. Under the Metrolinx Act the investment strategy is scheduled for completion by June 2013. This was the subject of an earlier report to Council (report No.) The B-Line has been identified as a 15-year priority project, the A-Line in the 15-year plan and the T-Line in the 25 year plan.

The Big Move also imagines a future in which key transit stations become mobility hubs, where transportation modes, including rapid transit, local transit, specialized transit, cycling and accessible pedestrian networks come together seamlessly.

BLAST Network

For Hamilton, the Big Move identified five projects that are recommended for implementation over the next 25+ years. These included the two projects identified as part of MoveOntario 2020 (B-Line and A-Line), in addition to three corridors which are referred to as the T-Line, S-Line and L-Line. In Hamilton, the full system is referred to as “B-L-A-S-T”. The corridor limits and timeline for implementation, as per the RTP, of each line is described below:

- **“B-Line”** - Top 15 Priority Project
  - Main/King Corridor – University Plaza to Fifty Road (Metrolinx RTP identifies short term implementation for McMaster University to Eastgate Square)
  - This corridor connects the downtown to major educational, retail, civic and institutional facilities

- **“A-Line”** – 15 years
  - James/Upper James - Waterfront to Airport (Metrolinx RTP identifies short term implementation from Downtown to Airport)
  - This corridor connects to major recreational, mobility hubs, Downtown, civic industrial, retail, institutional and Airport facilities

- **“T-Line”** – 25 years
  - Hamilton Mohawk – Centre Mall to Meadowlands (using Mohawk Road)
  - This corridor connects the major retail segments of the city as well as industrial uses

- **“S-Line”** – 25+ years
  - Hamilton Centennial Road/Rymal Road – Eastgate Square to Ancaster Business Park
  - This corridor connects industrial and retail facilities

- **“L-Line”** – 25+ years
  - Connection between Waterdown and Downtown Hamilton (Metrolinx RTP identifies this corridor as part of the extension of Dundas Street into Waterdown)
  - This corridor connects civic, retail and the Downtown facilities.
Mobility Hub Guidelines

The Mobility Hub Guidelines developed by Metrolinx have been prepared to guide planning and development at mobility hubs in the GTHA. The City of Hamilton has three Mobility Hubs as identified in The Big Move: James St. North, Downtown Hamilton and Mohawk at Upper James, which shall all be subject to these guidelines. These guidelines focus on the factors that contribute to creating successful mobility hubs, and address topics such as transit station design, station circulation and access, transit customer information and wayfinding, land use and urban design surrounding rapid transit stations, and funding and implementation.

MTO Transit Supportive Guidelines

The Transit Supportive Guidelines include transit-supportive principles and strategies to promote development patterns that make transit less expensive, less circuitous and more convenient and to enhance the service and operations characteristics of transit systems to make them more attractive to potential transit users. These guidelines provide an
important reference for the City of Hamilton in their planning and decision-making processes. Overall these guidelines provide direction on the following:

- Create a transit-supportive community structure
- Retrofit existing built-up areas to make existing development more transit supportive
- Coordinate transit and land use decisions to minimize the need for trips and enhance access to transit services
- Create a regional and local street and block pattern that supports efficient transit service and maximizes connectivity
- Create complete streets that supports and balance the needs of all users
- Employ a range of targeted strategies and programs to encourage increased transit ridership
- Locate and design transit stations and stops to enhances accessibility and user comfort
- Create a transit-supportive urban form
- Develop a family of transit services that cater to different patterns of land use and commuting needs
- Integrate amenities and services to enhance user convenience and comfort.

Provincial Policy Statement (2005)

The Provincial Policy Statement, 2005 was issued under the authority of the Planning Act, and provides direction on matters of provincial interest related to land use planning and development. It promotes a provincially “policy-led” planning system in which municipal Official Plans and any planning decisions are consistent with the objectives and details of the provincial policy. The PPS encourages:

- A high level of Connectivity within and among transportation systems and modes
- land use pattern, density and mix of uses that minimize the length and number of vehicle trips and support the development of viable choices and plans for public transit and other alternative transportation modes, including commuter rail and bus
- The integration of transportation and land use considerations
- the protection of corridors and rights-of-way for transportation and transit


The Growth Plan takes the PPS policy framework and outlines more specific policy direction for the Greater Golden Horseshoe. The Growth Plan is based on a series of guiding principles which are aimed at building compact, complete and vibrant communities; managing growth to support a strong competitive economy; making more efficient and effective use of infrastructure; protecting and enhancing our natural resources including land, air and water. The Growth Plan encourages that the transportation system within the GGH will be planned and managed to:

- provide connectivity among transportation modes for moving people and for moving goods
• offer a balance of transportation choices that reduces reliance upon any single mode and promotes transit, cycling and walking
• be sustainable, by encouraging the most financially and environmentally appropriate mode for trip-making
• offer multi-modal access to jobs, housing, schools, cultural and recreational opportunities, and goods and services
• provide for the safety of system users.

The City's Official Plan and Transportation Master Plan must conform to the Growth Plan.

**Ontario Coroner's “Pedestrian Death Review” (2012)**

The Ontario Coroner's “Pedestrian Death Review” was released in 2012. Key report recommendations including the following:
- Adopting a “complete streets” approach to guide the development of new communities and re-development of existing communities;
- The Province of Ontario should develop a Walking Strategy for Ontarians;
- The Ministry of Transportation (MTO), as a stakeholder in developing the above strategy should solicit feedback regarding opportunities and barriers in policy and legislation such as the Highway Traffic Act.
- All municipalities in the Province of Ontario should review the collision history of the road before initiating road reconstruction or resurfacing to proactively seek to improve pedestrian safety.
- The Ministry of Transportation should create an educational body with representatives from both governmental and non-governmental organizations

Hamilton is well positioned to meet all of the municipal-related recommendations identified by Coroner’s Report. The City’s Pedestrian Mobility Plan provides a complete streets approach to road design and is intended to be applied through the routine accommodation of road reconstruction, resurfacing and new road construction projects. In addition, the Hamilton Strategic Road Safety Program (HSRSP) currently includes a review of all pedestrian collisions and is currently in development of an education and awareness campaign aimed at distracted and aggressive drivers in order to improve road safety in the City. Pedestrian education is also a key component of the HSRSP.

The City is a ready and willing partner with the Ministry of Transportation to any program developed by the Ministry to improve pedestrian safety and to be an active participant in any undertakings by the Ministry relating to pedestrian activity.

**Ontario Coroner’s “Pedestrian Cycling Review” (2012)**

The Ontario Coroner's “Cycling Death Review” was released in June 2012. Key report recommendations include:
- Adoption of a “complete streets” approach – focused on the safety of all road users – for the benefit of communities throughout Ontario,
• Development of an Ontario Cycling Plan to guide the development of policy, legislation and regulations and the commitment of infrastructure funding to support cycling in Ontario,
• Creation of a cycling safety public awareness and education strategy, including drivers giving adequate space to cyclists,
• Promotion of the use of bike helmets for cyclists of all ages, and
• Prioritizing the development of paved shoulders on provincial highways.

Hamilton is “on track” with the actions as identified in the Coroner’s report, given the “Share the Road” education campaign designed by the Hamilton Cycling Committee, the reintroduction of CAN-BIKE courses through the Recreation Division, the City’s Strategic Road Safety Program, and past expansion of the cycling network across the City; but there are projects as identified in the Council approved cycling master plan that are not proceeding because of a lack of Council support. Such decisions against cycling infrastructure are suggested to be reconsidered.

B. City of Hamilton Policy and Strategic Directions

Vision 2020

One of the themes of Vision 2020’s was “Changing Our Mode of Transportation”. This theme identified two transportation related goals:

• To develop an integrated sustainable transportation system for people, goods and services, which is environmentally friendly, affordable, efficient, convenient, safe, and accessible.
• To encourage a shift in personal lifestyle and behaviour towards transportation choices that enhance personal health and fitness, save money, and have the lowest environmental cost.

Corporate Strategic Plan objective1.4 (iii)

Develop an integrated, multi-modal, public transportation program, including implementation of rapid transit, conventional transit, active transportation (e.g. pedestrian, cycling) and the associated transportation demand management (TDM) plan

• Conventional, Rapid and Inter-Regional Transit: Technical, Financial and Land Use Considerations (CM11016/PW11064/PED11154/FCS11072) October 13 2011

Urban Hamilton Official Plan & Growth Related Integrated Development Strategy (GRIDS)

GRIDS was a planning process that identified a broad land use structure, associated infrastructure, economic development strategy and the financial implications for a growth to serve Hamilton for the next 30 years. It provided the basis for growth and development in the City, as defined in the new Rural and Urban Official Plans.
Policies of the Urban Hamilton Official Plan encourage development around transit and land use and transportation planning integration. In general, the future urban structure described in the Urban Hamilton Official Plan refines the nodes and corridors identified in GRIDS, the City’s growth management strategy. The urban structure policies outline the relationship between a more compact urban form and transit within the urban nodes and corridors structure of the City.

This Plan recognizes the relationship between the transportation network and its impact on quality of life and economic development potential. The integrated transportation network will offer a greater range of transportation mode choice. An improved and efficient transportation network is a key component of complete communities - creating the vital link between activities and land uses throughout the City. Improved mode choice can be accomplished through a better balance between the competing needs of the street network including cars, transit, active transportation, goods movement and parking. A balanced integrated transportation network shall contribute to vibrant streets where pedestrians and cyclists feel comfortable and can co-exist with traffic on the street, improving health and quality of life.

**Nodes and Corridors Urban Structure**

The foundation for future growth and development in the City of Hamilton is based on a Nodes and Corridors structure. The urban system includes a number of key focal points of activity know as nodes, well connected by a series of corridors. These are key areas for intensification in the approved growth concept, intended to include a broad mix of land uses including higher-density residential uses, retail, institutional and recreational uses. Corridors are also identified as the locations for higher order transit services, linking the nodes together and facilitating the movement of people from place to place. The nodes and corridors urban structure is contained within the Urban Official Plan (adopted 2009 and approved in 2011, under appeal).

The location of Nodes and Corridors are identified by Schedule E of the OP (see page 6 of Appendix A). The following Nodes form part of the urban structure:

- Downtown Urban Growth Centre
- Limeridge Sub-Regional Service Node
- Eastgate Sub-Regional Service Node
- Waterdown Community Node
- Dundas Community Node
- Ancaster Community Node
- Meadowlands Community Node
- Rymal and Upper James Community Node
- Heritage Green Community Node
- Eflrida (Rymal Road East) Community Node
- Stoney Creek Community Node
- Centre Mall Community Node
- Mohawk College/St. Joseph’s Hospital (Mountain Campus) Major Activity Centre
• McMaster University/ McMaster University Medical Centre Major Activity Centre

The Nodes are connected by the following network of Urban Corridors:

• Main-King-Queenston Primary Corridor – West of the Downtown Urban Growth Centre (UGC) includes Main Street West from McMaster University at approximately Cootes Drive and King Street West from Longwood Road, both to Queen Street. East of the UGC includes King Street East and Main Street East to the Delta. East of the Delta, includes Main Street East to the Queenston traffic Circle and then Queenston Road to the Eastgate Sub-Regional Service Node at Centennial Parkway.

• James - Upper James Primary Corridor – Includes James Street north and south of the UGC to the escarpment and James Mountain Road up the escarpment. Above the escarpment, includes West 5th Street to Fennell Avenue, Fennell Avenue from West 5th Street to Upper James Street and Upper James Street from the escarpment to Airport Road.

• Main/Osler Secondary Corridor - Includes Osler Drive/Main Street West from west of Grant Boulevard to approximately Cootes Drive.

• Highway 8 Secondary Corridor - Includes Highway 8 from the Eastgate Sub-Regional Service Node at Centennial Parkway to Fruitland Road. A Potential expansion of the Secondary Corridor has been identified along Highway 8 from Fruitland Road to Fifty Road and northerly to the future multi-modal transit hub.

• Centennial – Upper Centennial Secondary Corridor - Includes Centennial Parkway from north of Barton Street to the escarpment and Upper Centennial above the escarpment to the Efirda (Rymal Road East) Community Node.

• Rymal Road Secondary Corridor - Includes Rymal Road from the Rymal and Upper James Community Node to the Efirda (Rymal Road East) Community Node.

• Mohawk Road Secondary Corridor - Includes Mohawk Road West from the Linc/Meadowlands Community Node to the Limeridge Sub Regional Service Node at Upper Wentworth Street.

• Ottawa Street Secondary Corridor – Includes Ottawa Street from Main Street East to the Centre Mall Community Node at Barton Street.

The above noted Corridors correspond generally with the Potential Rapid Transit Line (B.L.A.S.T.) network on Appendix B of the Official Plan. The Urban OP, established the City’s corridors as a significant opportunity for creating vibrant pedestrian and transit oriented places through investment in infrastructure, residential intensification, infill and redevelopment and careful attention to urban design. Policy E.2.4.13 of the Official Plan specifically states that Corridor studies or secondary planning shall be
undertaken for the Urban Corridors to provide greater direction on mix of uses, heights, density, built form and design.

Transportation Policy Papers 2004

The City of Hamilton Transportation Master Plan sets out the long term approach to providing transportation services in the City. A series of Policy Papers were prepared as the basis for the City-wide Transportation Master Plan. These were developed in conjunction with the Growth Related Integrated Development Strategy (GRIDS) and adopted by Council in May, 2006. The Transportation Master Plan was developed as three distinct phases. The first phase consisted of the technical calibration of the existing transportation model to reflect current transportation conditions in Hamilton. The second phase focused on the development of 23 policy papers in the following areas: Travel Demand, Urban Development, System Performance, Infrastructure Planning and Infrastructure Financing. The Policy Papers were endorsed by Council on November 24, 2004.

Transportation Master Plan 2007

The third phase of the planning process was the development of the Transportation Master Plan (TMP) itself. The TMP was approved by Council in May, 2007.

Strategic Transportation Solution

The City of Hamilton overriding transportation strategy is to rely on transit and travel demand management, in combination with road capacity optimization to solve transportation problems, before looking to road expansion. It is also recognized that adequate road infrastructure is essential for economic development and that strategies must reflect a balanced transportation network.

The following table summarizes the objectives and guiding principles adopted as part of the TMP.

Targets for transportation demand were established that reflect long standing direction of the City of Hamilton to reduce its environmental impacts while increasing mode choice and accessibly for its residents. These strategic targets, summarized in the table below, are based on significantly increasing the portion of trips made by public transit, walking, cycling, as well as reducing trips through travel demand management. Near term targets are reflected of the 2011 horizon and long term targets are reflective of the 2021-2031 timeframe.
## Exhibit 2: Transportation Master Plan Objectives and Principles

In 2031, the City of Hamilton’s transportation system will:

<table>
<thead>
<tr>
<th>Objective</th>
<th>Objective 1</th>
<th>Offer safe and convenient access for individuals to meet their daily needs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Principle 1(a)</td>
<td>Transportation facilities and services should be safe, secure and barrier-free</td>
<td></td>
</tr>
<tr>
<td>Principle 1(b)</td>
<td>Each transportation mode should have an acceptable level of service</td>
<td></td>
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<tr>
<td>Principle 1(c)</td>
<td>Non-travel alternatives and shorter trips should be encouraged</td>
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<table>
<thead>
<tr>
<th>Objective 2</th>
<th>Offer a choice of integrated travel modes, emphasizing active transportation, public transit and carpooling</th>
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<tbody>
<tr>
<td>Principle 2(a)</td>
<td>Alternatives to single-occupant vehicle travel should be practical and attractive</td>
</tr>
<tr>
<td>Principle 2(b)</td>
<td>Transportation facilities and services should be continuous and seamlessly integrated</td>
</tr>
<tr>
<td>Principle 2(c)</td>
<td>The health benefits of active lifestyles should be recognized and promoted</td>
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<tr>
<th>Objective 3</th>
<th>Enhance the liveability of neighbourhoods and rural areas</th>
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</thead>
<tbody>
<tr>
<td>Principle 3(a)</td>
<td>Transportation facilities should reflect and complement their community context</td>
</tr>
<tr>
<td>Principle 3(b)</td>
<td>Noise and other undesirable impacts of traffic on residential areas should be minimized</td>
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</tbody>
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<thead>
<tr>
<th>Objective 4</th>
<th>Encourage a more compact urban form, land use intensification and transit-supportive node and corridor development</th>
</tr>
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<tbody>
<tr>
<td>Principle 4(a)</td>
<td>Investment in transit-supportive land uses should be encouraged by quality public transit services and facilities</td>
</tr>
<tr>
<td>Principle 4(b)</td>
<td>Transportation facilities should meet current needs while remaining adaptable to those of the future</td>
</tr>
<tr>
<td>Principle 4(c)</td>
<td>Zoning, urban design and parking management strategies should minimize land consumed by automobile travel</td>
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<tr>
<th>Objective 5</th>
<th>Protect the environment by minimizing impacts on air, water, land and natural resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Principle 5(a)</td>
<td>The use of greenspace for new infrastructure should be minimized</td>
</tr>
<tr>
<td>Principle 5(b)</td>
<td>Transportation technologies and behaviours should reduce energy consumption and air emissions</td>
</tr>
<tr>
<td>Principle 5(c)</td>
<td>The impacts of surface water runoff from transportation facilities should be minimized</td>
</tr>
</tbody>
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<tr>
<th>Objective 6</th>
<th>Support local businesses and the community’s economic development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Principle 6(a)</td>
<td>The efficiency of goods movement to, from and within the City should be maximized</td>
</tr>
<tr>
<td>Principle 6(b)</td>
<td>Businesses and institutions should remain accessible to employees and visitors</td>
</tr>
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<tr>
<th>Objective 7</th>
<th>Operate efficiently and be affordable to the City and its citizens</th>
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<tbody>
<tr>
<td>Principle 7(a)</td>
<td>Maximum value should be extracted from existing facilities and services</td>
</tr>
<tr>
<td>Principle 7(b)</td>
<td>Decisions should take into account the life-cycle costs of transportation facilities and services</td>
</tr>
<tr>
<td>Principle 7(c)</td>
<td>Transportation funding opportunities involving other governments, the private sector and individual users should be considered</td>
</tr>
</tbody>
</table>
Plan Elements

Public Transit

The TMP proposed a Higher Order Transit network for the City along with a number of related transit enhancements. A Key Element is to build a Bus Rapid Transit (BRT) network. Three primary corridors for BRT and ultimately other forms of Rapid Transit emerged from the working paper that was prepared:

- A Lower City east-west corridor on King Street/Main Street/Queenston Road
- A Central North-South Corridor on James Street and Upper James via Mohawk College
- A Mountain East-West Corridor on the Lincoln Alexander Parkway or parallel facility

In addition, the following Park and Ride locations were noted as a key priority:

- Meadowlands area
- Eastgate mall area
- Mount Hope (at or near Mountain Transit Terminal)
- Elfrida
- Winona
The TMP also proposed a number of improvements to conventional and accessible transit and supporting actions:

- Transit Service Extensions
- More compact mixed-use development around nodes and corridors throughout the City
- Comprehensive route restructuring study to determine how transit service should change in suburban areas
- Ensuring access for persons with disabilities
- Utilizing the Smart Commute Program to promote alternative strategies
- Guidelines on Transit-Supportive Densities

In terms of financial implications, it was estimated that the conventional transit fleet would need to expand from the current 205 vehicles to approximately 440 buses by 2031. At the time of preparation of the TMP, the cost was estimated at $91 million, or $3.6 million per year over 25 years. Additional associated transit capital costs related to transit facilities and the implementation of Bus Rapid Transit were an estimated 2007 cost of $51 million and $159 million respectively. Approximately $300 million would have to be invested in the conventional transit system over the next 25 years, or approximately $12 million per
year. This does not include the cost of replacing aging buses. Overall, it was projected that at least $20 million per year would need to be invested in the transit system.

Exhibit 5 provides a high level status of proposed infrastructure and projects. A more detailed review of transit operations and measures recommended to increase the role of transit in meeting current and future transportation needs is provide in Appendix B2 – Summary - Hamilton Street Railway Operational Review (March 2010).

**Cycling Network**

The TMP established a high level cycling network. Key aspects from a bicycle commuting perspective include:

- On- and off-street connections between McMaster University, Westdale neighbourhood, and Downtown Hamilton;
- On-street east-west route across lower Hamilton;
- Direct and protected on-street north-south routes in upper Hamilton, in addition to existing local routes;
- New Escarpment crossings, including a proposed dedicated inclined railway for pedestrians and cyclists in vicinity of Upper Wentworth Street and Concession Street.

Key aspects from a recreational cycling perspective include:

- Trail extensions and enhanced trail connections for the Harbour Waterfront Trail, Lake Ontario Waterfront Trail, Escarpment Rail Trail, and the Chippewa Rail Trail, among others; and
- New Escarpment crossings.

**Cycling Master Plan 2009**

The high level cycling network established in the 2007 TMP has been further detailed by the adoption of the cycling master plan *Shifting Gears 2009*. This plan recommends a network of multi-use trails and bike lanes that are to be completed in order to achieve City goals that are strongly endorsed by the City’s Strategic Plan; specifically, health, safety, and sustainability. Some of these projects are stand-alone retrofit projects, some are embedded in road reconstruction projects, some are part of new streets in new developments, and some are multi-use trail projects.

*Shifting Gears 2009* proposes approximately 550 km of bike lanes of which 150 km currently exist (~25%); and 190 km of major multi-use trails of which 140 km currently exist (~75%). There are also opportunities to utilize some convenient connections on streets with low traffic volumes simply with directional signage (i.e. no bike lanes are required); and over 90% of that recommended network is completed.

Paved shoulders are also recommended on critical roads in rural areas of the City. This aspect of the cycling master plan was not identified as a priority in the report to
PWC/Council in 2009 because it was recognized that achieving a well-connected cycling network in the urban area as a priority will provide a greater benefit to a larger proportion of citizens. Currently, approximately 5% of the recommended network of paved shoulders exists.

Section 6 of the cycling master plan “Implementation Strategy” addresses the annual implementation costs, the approval process for individual projects, annual maintenance costs, funding sources both internal and external, and benefits (i.e. return on investment). The plan assumes a 20 year implementation schedule, thus an estimated $2.5 million annually to complete the entire urban and rural cycling network.

The PWC minutes for June 15 2009 include the following approved motion as stated as item 8 (c) regarding PW09068:

(c) That, upon completion of the thirty day public review period, the General Manager, Public Works, be authorized and directed to schedule the recommended projects for consideration in the 2010 and future years Capital Budget deliberations;

Regarding implementation costs, report PW09068 stated that:

“… to complete the cycling network in a timely fashion, that the annual budget for cycling infrastructure be increased, subject to budget deliberations. The starting point for the budget process will be an annual request for $1,250,000. While $1,250,000 annually is less than the amount required to complete the entire network in twenty years, it will allow for good success on the urban portion and is compatible with staff’s ability to undertake these projects.”

A review of spending on cycling infrastructure in previous years was conducted as per a request of PWC, and that report (PW10063) determined an estimated expenditure for all cycling investment, from amalgamation (January 1, 2001) to December 2008, to be approximately $7.1 million, or $890,000 per year.

The following table shows what the approved expenditure has been since 2009. The City has been making solid progress implementing cycling infrastructure, especially given the financial constraints facing municipalities. Notwithstanding, it should be noted that 5% of the network would need to be constructed annually to complete the cycling network in 20 years (i.e. 2029), and that level of implementation has not been achieved. In the plan, the approximate density of cycling infrastructure in the urban area is approximately one corridor every 2 km. Exhibit 4 indicates that the City has been able to increase the average annual expenditure to $1.23 million, which is comparable to the $1.25 million as suggested in the PWC report that approved the cycling master plan in 2009 (PW09068). (Note the table does not include cycling infrastructure constructed as part of new developments). These financial numbers do not include the $14 million that was spent on the Red Hill Valley Trail, including the crossing of the QEW, as the funding for that project was provided from the Province.
**Exhibit 4: Cycling Expenditure Annually Since 2009**

<table>
<thead>
<tr>
<th>Year</th>
<th>Portion of CMP Identified Projects* (by length)</th>
<th>Portion of CMP Projects Plus Paved Shoulders</th>
<th>Bicycle Route Projects</th>
<th>Embedded in Individual Road Reconstruction Projects</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>1%</td>
<td>1%</td>
<td>300,000</td>
<td>600,000</td>
<td>900,000</td>
</tr>
<tr>
<td>2010</td>
<td>3%</td>
<td>2%</td>
<td>300,000</td>
<td>1,835,000</td>
<td>2,135,000</td>
</tr>
<tr>
<td>2011</td>
<td>1%</td>
<td>1%</td>
<td>300,000</td>
<td>200,000</td>
<td>500,000</td>
</tr>
<tr>
<td>2012</td>
<td>3%</td>
<td>2%</td>
<td>300,000</td>
<td>1,275,000</td>
<td>1,575,000</td>
</tr>
<tr>
<td>2013 planned</td>
<td>6%</td>
<td>3%</td>
<td>300,000</td>
<td>730,000</td>
<td>1,030,000</td>
</tr>
</tbody>
</table>

* "Identified Projects" include bike lanes and major multi-use trails

Exhibit 6 summarizes the status of proposed actions and projects.

**Pedestrian Network**

The success of the TMP strategic solution requires a holistic approach to mobility including initiatives to:

- Improve the quality and extent of pedestrian and bicycle infrastructure;
- Encourage shorter average distances between home, work and other major destinations;
- Increase awareness of non-motorized networks and safety requirements;
- Enhance the co-ordination of transit trips with walking and cycling trips; and
- Ensure the bicycle and pedestrian friendliness of new development.

**DRAFT Pedestrian Master Plan**

Establishing a Pedestrian Mobility Master Plan was a recommendation from the 2007 council approved City-wide Transportation Master Plan, the 2008 International Charter for Walking (endorsed by City Council), the Recreational Trails Master Plan, plus numerous other City initiatives that identify pedestrian mobility as an essential part of City-making. In November 2010, the Pedestrian Mobility Master Plan was initiated and is being undertaken consistent with Phase 1 and 2 of the Environmental Assessment process. A staff report will be going forward to Council in early 2013 for endorsement of the Pedestrian Mobility Master Plan.

Establishing a Pedestrian Mobility Master Plan was a recommendation from the 2007 council approved City-wide Transportation Master Plan, the 2008 International Charter for Walking (endorsed by City Council), the Recreational Trails Master Plan, plus numerous other City initiatives that identify pedestrian mobility as an essential part of City-making. In November 2010, the Pedestrian Mobility Master Plan was initiated and
is being undertaken consistent with Phase 1 and 2 of the Environmental Assessment process.

The City of Hamilton is only the second municipality in Ontario to undertake a pedestrian-specific plan (Ottawa is the other municipality) and the first to address the pedestrian environment at this level of detail for a master plan. This demonstrates the City’s commitment and innovation in accommodating pedestrian mobility issues, and active transportation within the City.

The Pedestrian Mobility Plan identifies the need to increase pedestrian safety and the number of walking trips to achieve the City-wide Transportation Master Plan targets. In addition, the study evaluated existing pedestrian policies, procedures and programs in order to develop a sustainable implementation strategy that will identify priorities for improvements and performance indicators.

The Pedestrian Mobility Plan is consistent with the City-wide Strategic Plan Vision and acts as one of the catalysts to achieving this broader vision for the City.

The key highlights of the plan are as follows:

• Neighbourhood pedestrian planning should characterize the health related attributes (such as the demographic profile) of its residents in order to calibrate the overall age friendly land use and transportation approaches needed. Once set, physical design measures should be selected and employed.
• Holistic approach to designing the street to accommodate all users, including the pedestrian in order to meet all travel requirements.
• Context Sensitive Design that will encourage the provision of amenities within the right of way that make public transit, pedestrian movement and cycling effective alternative transportation modes including better access to interesting destinations, increased shade from trees, differing sidewalk widths, pedestrian plazas.
• Land use patterns that are inter-related with pedestrian facilities and oriented to streets by maximizing existing planning policies.
• Enhancing and/or developing supportive policy that addresses matters such as urban Braille, transportation demand management, walking to school programs, education, enforcement and age sensitive design.

Road Network

The proposed TMP road network strategy generally reflects committed and planned improvements identified through previous studies. In total, approximately $418 million worth of roadway improvements were recommended. Even assuming the implementation of committed improvements and the most aggressive scenario with respect to travel demand management, it is projected that there will still be some remaining capacity deficiencies including those listed below.

Downtown and Central Escarpment Crossings: many of the Escarpment crossings are projected to continue to experience some congestion. Major expansions to the Downtown
road network are not consistent with the goals of promoting a pedestrian and transit supportive environment; therefore other approaches will be required:

- Accept some congestion as part of a successful Downtown
- Implement aggressive Transportation Demand Management (i.e. parking pricing)
- Additional transit improvements
- Postpone proposed conversion of east-west streets to two-way

**Red Hill Valley Corridor:** In the longer term, the Red Hill Valley Parkway may experience capacity limitations due to longer distance travel. This can be postponed by implementing additional Transportation Demand Management and/or auto disincentives (i.e. road pricing).

**Highway 403 Corridor:** This Provincial Highway corridor experiences regular congestion and this is expected to increase due to the growth in surrounding municipalities. Strategies to improve the person carrying capacity of the Highway 403 are required and could include the implementation of High Occupancy Vehicle lanes (similar to Highway 404 and Highway 403 in Mississauga). Potential improvements require on-going discussion with MTO.

**New Link to Airport** – Appropriate goods movement access to the Hamilton International Airport from the north and east has been identified as a significant issue. The 2005 Hamilton Goods Movement Study identifies the need to provide a connection between the Red Hill Valley Parkway and the Airport as a designated truck route.

Exhibit 7, attached, Illustrates the Proposed Road Infrastructure Improvements that resulted from the May 2007 Transportation Master Plan and the status of the recommended road projects. As can be seen in the summary, the City is making reasonable progress on road infrastructure, with approximately half of the road projects either completed or in progress. However, as many of these projects are still in the planning and/or design phases, there is still over $400 million worth of infrastructure proposed over the term of the Master Plan (2031).

**Goods Movement**

A goods movement study, the Hamilton Goods Movement Study (June 2005), was undertaken for the City. Key recommendations are to:

- Resolve freight bottlenecks including short term measures such as improving signage for truck routes to and from major industrial areas, to and from the Port and to and from the Airport.
- Re-examine specifications for truck routes within the City to ensure that clearances are appropriate for traffic entering and leaving the Port area in particular. This would involve more routine operation of oversized loads from the Port to eastbound and westbound destinations. A truck route study will be initiated by the City in 2007.
- Establish policies to accommodate 24-hour freight operations in the Port, Airport, and rail freight facilities.
• Support Hamilton Port Authority initiatives concerning establishment of 12 month operations, which involves eliminating or minimizing the three month closure of the Burlington Lift Bridge each winter for maintenance.

City of Hamilton Recreational Trails Master Plan

The Recreational Trails Master plan prescribes a comprehensive multi-purpose off-road recreational trail system to connect natural areas, cultural features and major land use destinations within the City of Hamilton. This system links to the on-road commuter systems and will be fully integrated into larger regional, and national network of trails. This Trails Master Plan provides direction on a system wide basis with respect to the following among others:
• Plan for the development and operation of a trail system within the City of Hamilton that provides for a wide range of recreational opportunities;
• Connect major urban and rural land uses by providing multi-purpose trails and integrate the system with on-street cycling and sidewalk systems.
• Support public and private transportation demand management plans by providing alternative modal interconnections between residential, employment, commercial and institutional centres;
• Provide a safe cycling and pedestrian environment;
• Promote physical activity and healthy lifestyles


The City of Hamilton TOD guidelines provide direction to guide policies and development within the City in order to encourage a better integration of land use and transportation. The core components of TOD should include: compact, mixed use, highly pedestrianized areas with connections to transit. The guidelines serve as a user friendly guide that identifies the components that should be part of development or redevelopment and are a useful tool to help implement the existing policy such as the Official Plan and Transportation Master Plan. The TOD guidelines are based on the following principals:

• Promote Place Making – Creating a Sense of Place
• Ensure a Mix of Uses/Appropriate Land Uses
• Address Parking Management
• Focus on Urban Design
• Create Pedestrian Environments
• Require Density and Compact Urban Form
• Respect Market Conditions
• Take Comprehensive Approach to Planning
• Plan for Transit and Promote Connections (for all modes)
• Promote Partnerships and innovative Implementation

-18-
Hamilton Transit Ridership Growth Plan

The guiding principles for the transit ridership growth plan are:

- The need to improve services and safety for existing riders so they become ambassadors for transit;
- Adoption of strategic approach that considers transit’s role in the larger transportation, social, economic and environmental context, including the ability for transit to facilitate the City’s growth management objectives and policies for a more balanced transportation system;
- The need to pursue initiative that are cost-effective with high visibility, and those that improve the image of the transit system;
- The benefits of marketing the transit system as an important city service and one that requires attention to position Hamilton for future economic success, community well-being, affordability for passengers and environmental sustainability.

Main King Queenston Corridor Strategy Study

In 2010, work began on the first corridor planning study, the Main, King, Queenston (B-Line) Nodes and Corridors Land Use Planning Study, to implement the policy framework in the City of Hamilton. Background studies and consultation revealed a number of challenges and opportunities related to the Corridor. Changing demographics combined with other factors, can result in declining investment, image and services along the Corridor. One of the key outcomes of consultation is the recognition of the need for reurbanization along the Corridor. A key element of revitalization and transformation is intensification. Therefore, a central element of the Corridor Plan will focus on how to achieve intensification in a manner that brings vitality to the Corridor while respecting established neighbourhoods.

In April 2012 Council approved a corridor development option, Focused Reurbanization, which would promote the Corridor as a mixed use, transit oriented corridor and would provide the necessary direction to achieve the City’s intensification targets. The approved corridor concept applies a variety of built forms and ground level activity scenarios for the corridor with the focus of reurbanization activity concentrated in focal areas (transit stops). Land assembly would be facilitated in focal areas to promote mid-rise buildings. This Option provides a balanced approach, facilitating and allowing for reurbanization and intensification, while addressing potential impacts on, and fit with, adjacent neighbourhoods. As part of the next steps, a detailed strategy and implementing Official Plan and Zoning By-law Amendments for the Main, King, Queenston (B-Line) Corridor will be prepared. Approximately 11,400 additional residential units, or approximately 19,145 people, could potentially be added along the Corridor (excluding the downtown Urban Growth Centre).
In April 2012, the City of Hamilton adopted City Wide Corridor Planning Principles and Design Guidelines. The purpose of the Guideline is to provide a set of planning principles and implementing design guidelines for Corridors in the City of Hamilton. These principles and guidelines provide direction for new development, public realm investments and future planning studies along primary and secondary Corridors across the City. The following are the key principles proposed in the document to guide the development of Corridor planning initiatives:

Corridors should be planned and developed to:

(a) Support and facilitate development and investment that contributes to the economic and social vitality of the Corridor and adjacent neighbourhoods.

(b) Promote and support development which enhances and respects the character of existing neighbourhoods where appropriate and creates vibrant, dynamic, and livable urban places through high quality urban design.

(c) Develop compact, mixed use urban environments that support transit and active transportation.

(d) Promote and support an innovative sustainable built environment that uses resources efficiently and encourages a high quality of life.

(e) Identify areas of change as the locations for new development along Corridors.

The guidelines were prepared considering development potential as it relates to typical built form and property size. They provide guidance on development along corridors including issues such as maximum building height (related to property depth and street width), minimum building height, landscaping, parking and loading, relationship of buildings to the street (pedestrian focus area, flexible area, residential character area), setbacks, sidewalks and streetscapes and land assembly to provide for developable parcels, shadow impacts, and precinct site development.
Transportation Master Plan Status of Implementation Summary Tables
<table>
<thead>
<tr>
<th>Category</th>
<th>Project Description</th>
<th>2007 Cost (Millions)</th>
<th>2012 Cost (Millions)</th>
<th>Status</th>
<th>Planning</th>
<th>Design</th>
<th>Implementation</th>
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1. LRT technology chosen for further consideration
2. Metrolinx Quick Wins Funding
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<tr>
<th>Action</th>
<th>Action Lead</th>
<th>Action Priority</th>
<th>Action Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proceed with implementation of the planned network</td>
<td>Traffic Engineering Section, P.W.</td>
<td>High</td>
<td>In progress</td>
</tr>
<tr>
<td>Investigate design options for a cycling facility connecting Greensville to Dundas along Hwy 8</td>
<td>Traffic Eng. Section, P.W. to initiate and determine lead</td>
<td>High (as EA is underway)</td>
<td>Study completed</td>
</tr>
<tr>
<td>Aim to incorporate signal activation for cyclists with all future signal design</td>
<td>Traffic Engineering Section, P.W.</td>
<td>High</td>
<td>In progress</td>
</tr>
<tr>
<td>Offer cycling education to teens and adults – possibly CAN-BIKE</td>
<td>Traffic Engineering Section, P.W.</td>
<td>High</td>
<td>In progress</td>
</tr>
<tr>
<td>Adding more enclosed bike parking facilities throughout the City</td>
<td>Strategic Planning and Rapid Transit Section, P.W.</td>
<td>High</td>
<td>Implementing</td>
</tr>
<tr>
<td>Complete an inventory of bike racks at City facilities and address deficiencies</td>
<td>Traffic Engineering Section, P.W.</td>
<td>High</td>
<td>In progress</td>
</tr>
<tr>
<td>Monitoring, Review &amp; Council Updates</td>
<td>Traffic Engineering Section, P.W.</td>
<td>High</td>
<td>Implementing</td>
</tr>
<tr>
<td>Discuss with Haldimand County the connection of the Chippawa rail Trail south of Haldibrook Rd</td>
<td>Traffic Eng. Section, P.W. to initiate and determine lead</td>
<td>Medium</td>
<td>In progress</td>
</tr>
<tr>
<td>Further promote the existing Cyclemania program provided by the Hamilton Police Service</td>
<td>Traffic Eng. Section, P.W. to initiate and determine lead</td>
<td>Medium</td>
<td>Implementing</td>
</tr>
<tr>
<td>Consideration of adding a bike icon to street name plates on streets that provide specific cycling infrastructure</td>
<td>Traffic Engineering Section, P.W.</td>
<td>Medium</td>
<td>No action</td>
</tr>
<tr>
<td>Consider additional wayfinding signage – including distance information</td>
<td>Traffic Engineering Section, P.W.</td>
<td>Medium</td>
<td>Implementing</td>
</tr>
<tr>
<td>Investigate bicycle routing issues on streets that are being considered for rapid transit</td>
<td>Strategic Planning and Rapid Transit Section, P.W.</td>
<td>Medium</td>
<td>In progress</td>
</tr>
<tr>
<td>Review City bylaws to assess consistency with Provincial laws</td>
<td>Traffic Engineering Section, P.W.</td>
<td>Medium</td>
<td>In progress</td>
</tr>
<tr>
<td>Discuss with the Ministry of Transportation facilities proposed in the plan beside Provincial highways</td>
<td>Traffic Eng. Section, P.W. to initiate and determine lead</td>
<td>Low</td>
<td>In progress</td>
</tr>
<tr>
<td>Discuss with Haldimand County a connection along the existing Hwy 6 corridor - but likely after the construction of the planned Hwy 6 west of the existing corridor south of White Church Rd</td>
<td>Traffic Eng. Section, P.W. to initiate and determine lead</td>
<td>Low</td>
<td>No action</td>
</tr>
<tr>
<td>Investigate bike friendly facilities at existing escarpment stairs at Dundurn St and Wentworth St</td>
<td>Traffic Eng. Section, P.W. to initiate and determine lead</td>
<td>Low</td>
<td>In progress</td>
</tr>
<tr>
<td>Road Name</td>
<td>From</td>
<td>To</td>
<td>Description</td>
</tr>
<tr>
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<td>-----------------------</td>
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<td>Airport Access Road</td>
<td>RHVP</td>
<td>Hwy 6</td>
<td>New Road</td>
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<td>Tradewind/Cormorant</td>
<td>Trinity</td>
<td>New Road</td>
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<td>Ancaster New Midblock Collector</td>
<td>Cormorant</td>
<td>Tradewind</td>
<td>New Road</td>
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<td>Arvin Avenue</td>
<td>McNeilley</td>
<td>existing and</td>
<td>New Road</td>
</tr>
<tr>
<td>Barton Street</td>
<td>Fruitland</td>
<td>TWLTL</td>
<td>New Road</td>
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<tr>
<td>Baseline Road</td>
<td>Winona</td>
<td>North Service</td>
<td>TWLTL</td>
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<tr>
<td>Binbrook Road</td>
<td>E &amp; W of Hwy 56</td>
<td>Intersection</td>
<td>Improvements</td>
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<td>Bold Street</td>
<td>Queen</td>
<td>James</td>
<td>Two-way Conversion</td>
</tr>
<tr>
<td>Centre Road/Hamilton Street</td>
<td>Northlawn</td>
<td>John</td>
<td>TWLTL</td>
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<tr>
<td>Community Avenue</td>
<td>Stoney Creek Limits</td>
<td>Teal</td>
<td>Urbanization</td>
</tr>
<tr>
<td>Darbhall Road</td>
<td>StoneChurch</td>
<td>Dickenson</td>
<td>New Road north of Dickenson TWLTL</td>
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<tr>
<td>Dickenson Road</td>
<td>V of Glover</td>
<td>Glancaster</td>
<td>Urbanization and turn lanes</td>
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<tr>
<td>Duke Street</td>
<td>Queen</td>
<td>James</td>
<td>Two-way Conversion</td>
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<tr>
<td>Falcon Road</td>
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<td>Hwy 8</td>
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<td>Rymal</td>
<td>Binbrook</td>
<td>Left Turn Lanes</td>
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<td>Barton</td>
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<td>Beyond 2021</td>
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<td>Teal</td>
<td>Pinelands</td>
<td>Urbanization</td>
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<td>Garner Road / Wilson St. / Hwy 2</td>
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<td>Rymal</td>
<td>TWLTL</td>
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<td>Dickenson</td>
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<td>Dickenson</td>
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Total Projects Identified: 85
Projects Completed: 26
Projects Initiated: 34
Projects No Longer Considered: 22
Projects Outstanding: 42
Projects in Progress - EA complete/underway/portion built: 34
Projects in Progress - Not Started: 42
Projects Not Considered: 2

Total: 85
Appendix B2

Summary - Hamilton Street Railway Operational Review (March 2010)

INTRODUCTION

The HSR Operational Review was initiated by the Transit Division in August 2008 in response to recommendations of the Transportation Master Plan and other City initiatives to increase the role of transit in meeting current and future transportation needs. Completion of the study also fulfilled a commitment made to the Amalgamated Transit Union. The report was received by Council on August 12, 2010.

Although the plan and recommendations contained in the review have not been fully implemented, they have been used as input during annual operational and service plan reviews. The 2010 Operational Review has also provided significant input into the main “Rapid Ready” 2012 report.

The following is a summary of the full 2010 report. It should be noted that the data and figures are as contained in the 2010 report and have not been updated.

Population and Employment Growth

Population growth in the City of Hamilton is forecast to occur mainly in suburban areas which traditionally have had lower density and limited mixed development patterns, such as Flamborough, Stoney Creek and Glanbrook, and to a lesser extent, Ancaster and Dundas. With the exception of Lower Hamilton, these areas have limited conventional scheduled transit service, whereas the former City of Hamilton areas are served by conventional scheduled services that provide higher frequencies and better coverage. If this future growth can occur in higher density and mixed land use forms, as desired by the Growth Related Integrated Development Strategy (GRIDS) for the City of Hamilton, these areas could present opportunities for increased transit ridership. This will, however, require improvements to be made in the frequency, travel time and reliability of these services to and from these areas to key transit trip destinations such as Downtown and Central, East and West Hamilton.

The fastest employment growth in the City of Hamilton is happening at medical centres/hospitals and the service sector. The current large employment at Hamilton’s various medical centres and their potential growth in the future arising from the aging population in the City of Hamilton and surrounding areas present opportunities for increased ridership. This can be achieved by further enhancement to transit services, such as improved frequency and reliability, combined with more aggressive efforts by the City’s TDM Coordinator to expand the use of the Employer Pass Program for employees of the Hamilton Health Centres.
In 2001, approximately 81% of the total trips made by residents stayed within the City of Hamilton. However, this figure has been declining since 1986 when 86% of trips stayed within the City. Between 1986 and 2001, the proportion of Hamilton’s labour force employed outside Hamilton increased from approximately 17% to 28%.

With future potential growth of trips from Hamilton Region to the Greater Toronto Area and vice versa, continued improvements to the HSR operated services to the GO Transit stations will be important.

RECOMMENDATIONS

In order to achieve the objectives of ensuring public transit services are being operated in a safe, efficient and effective manner, considering the needs of customers, employees and the general public and to move towards achieving the targets in the City’s Transportation Master Plan, the following are the key recommended actions.

Exhibit: List of Recommended Actions

1. Adopt this report in principle as the basis for planning, managing and financing the Transportation Master Plan implementation over the period, 2010 to 2014.
2. Develop and implement a comprehensive marketing and corporation communications plan
3. Brand the new mobility program
4. Undertake a transit priority measures study to prepare a suitable strategy for giving transit vehicles priority at traffic congestion points throughout the City.
5. Adopt the infrastructure plan.
6. Enhance and expand the role of transit terminals across the city as transportation hubs. Construct transit terminals in the vicinity of McMaster University and Mohawk College.
7. Upgrade bus stop signage and accessibility features of bus stops including the addition of 147 shelters.
8. Undertake a transit facility needs study to define future needs and facility location strategy.
9. Adopt the Financing capital plan as summarized in section 4.7 of the full report (summarized below).

FINANCIAL SECTION

The 5-year term of the Service Plan has the following operating and financial implications:

The changes are a projected annual increase of 5% with annual revenue-hours of service growing to 806,910 from a base of 655,086 in 2008. Ridership is projected to increase from 21 million in 2008 to approximately 27 million by 2014 based on the proposed route changes and service improvements.

Fare revenues will increase consistent with the proposed fare strategy and annual small increases in fare rates from $32.6 million to $48.6 million by 2014. The purpose of the revised fare strategy is to increase revenues to primarily fund service improvements.
Direct operating costs will be $93,758,000 in 2014 compared to $63,801,000 in 2008. The capital budget will total approximately $65.3 million comprised of $54.5 million for 121 new buses (90 for replacement and 31 for service expansion), $3.0 million for construction of two new terminals, $1.47 million for additional staffing, $5.0 million for transit priority measures and $100,000 for a Transit Priority Study and Facility Needs Strategy study.

### Exhibit: 2010-2014 HSR Operating and Capital Budget

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**HSR SECTION**

Hamilton Street Railway (HSR) with over 175 buses on the road each day is one of the most visible public services in the community serving over 70,000 revenue passengers on an average weekday and just under 22 million passengers per year. Approximately 7% of the City’s population travels by transit everyday while an estimated 30% or more of the population make use of transit at some point during the year.

The HSR currently operates a network of 33 bus routes with service levels ranging from 22 hours a day, seven days a week to peak hour (6-9AM, 3-6PM) Monday to Friday only. In 2008, a total of 655,088 revenue-hours of service...
were operated with a staff of 585 and 217 buses. Almost 21 million trips were taken on HSR services representing a utilization rate (rides per capita) of 45.1

Overall, HSR provides cost-efficient fixed route transit services which are well-regarded by transit users.

As with any organization, there is room for growth and improvement. In particular, in the coming years, transit is expected to take on an increasing role in accommodating the travel needs of Hamiltonians in order to meet the City’s economic, environmental, and social objectives.

What do Stakeholders Say about HSR?

• HSR is generally regarded as a well-run service.

• Some perceive HSR as a social service and one that caters to students.

• Many decisions in City are made without considering the impacts to transit.

• HSR’s routes are difficult to understand if you are not familiar with the system.

• Even though HSR does not have fundamental flaws, it may be time for a major renewal of service design in concert with a commitment to invest in service improvements.

• Looking to the future, most feel that transit will play a greater role as environmental and energy concerns increase.

• All residents benefit from transit in some way, and should pay their share.

What is expected of HSR in the future?

The City’s strategic priorities and Transportation Master Plan calls for transit to take on a greater role in the future while policies at the federal, provincial and local level all point towards the goal of significantly increasing the role of transit.

City of Hamilton

Vision 2020 calls for a doubling of transit usage to 100 rides per person per year.

Transportation Master Plan has set target of reducing auto vehicle-km by 20% by 2031 – stressed importance of early and incremental improvement

New Official Plan embraces transit-oriented development policies

Federal/National

Investing billions of dollars in infrastructure, including rapid transit; rewarding communities that have comprehensive strategies.
The Canadian Urban Transit Association has set a goal for large cities to increase per capita transit ridership by 1.2% per year over next 30 years (or 50% increase overall by 2040).

Provincial

- Have identified Downtown Hamilton as a focus areas for growth.
- Have set a target to reduce greenhouse gas emissions by 80% by 2050.
- Metrolinx is investing in rapid transit.

How will HSR get there?

Transit ridership is tied to investment levels, population growth, quality of service delivery, affordability and transit supported policies (e.g. downtown parking fees). There are no magic strategies to grow transit ridership without incurring increased costs or sacrificing minimum service standards.

Fortunately, there are many ways that the City can leverage investments in transit to maximize growth in ridership. First and foremost, an integrated approach to the planning and operation of public transit is required, including strong links between the City’s existing transit services (HSR) and the shaping of land use around major transit corridors. In essence, transit ridership growth needs to be considered in all aspects of City planning and decision making.

Service Plan Characteristics:

- Simplify the system by straightening route alignments, minimizing redundancies and limiting the number of route branches and exception trips supported on individual routes.
- Improve riders’ ability to travel more directly (i.e., in a straight line) between origins and destinations and minimize onboard transit travel times.
- Decrease average wait times for boarding and transferring riders.
- Implement high speed Rapid Transit service in two priority high capacity corridors initially (B Line and A Line) and subsequent corridors identified in the City’s BLAST Rapid Transit Concept Plan.
- Transition from HSR’s historically radial design favoring travel to/from Downtown Hamilton, to a high-frequency grid design supporting ubiquitous travel patterns comparable to regional auto traffic. Facilitate travel to/from six major regional activity centers rather than the single city center. Service restructuring proposals focus on relocating the terminal points of outbound local routes from disconnected bus loops on the fringe of development areas to the integrated transit hubs, straightening alignments for better onboard travel times, and limiting the number of branches to two per route. Service
span and frequency would either improve or stay the same on virtually all routes.

- Re-align services in anticipation of future rapid transit services in the A-Line and B-Line corridor.

Exhibit: Proposed High Frequency Corridors (2015 and beyond)

To accomplish the goal of 80 - 100 annual transit rides per capita by 2031, HSR 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 frequent and high quality Rapid Transit services, plus a limited stop cross-town express service. The objective is to build on HSR’s strong base by increasing use by the population who have a choice of mode, particularly to major attractors such as educational facilities, business parks, medical facilities, and major shopping centres in Hamilton.

This strategic target cannot be achieved by HSR alone, and will require a paradigm shift in the way transit is viewed, planned for and funded in the City. All decisions regarding land use, finances and transportation generally will need to be viewed from the perspective of improving transit.

To realize the new vision for transit, there will need to be a significant shift in policy; a shift from a cost-driven to a market-driven service policy with less emphasis on cost-recovery. The following goals, objectives and service standards address this vision.

**Transit Hubs** – The proposed network focuses on six major destinations where enhanced transit service levels will be concentrated to increase network connectivity, reduce wait times, and upgrade facilities for HSR customers. Existing routes will be realigned to better serve the hubs, creating new direct linkages outside of Downtown with the potential for reverse direction bus ridership. Transit hub locations include: Downtown Hamilton; Eastgate Square; Lime Ridge Mall; McMaster University; Meadowlands Centre; Mohawk College.

**Rapid Transit** – Consistent with the City’s Transportation Master Plan and Rapid Transit Initiative, existing express bus services on Main/King (Route 10/B Line)
and Upper James (Route 20/A Line) be upgraded to RT operating standards. Like most RT systems that develop from a series of coordinated improvements in mixed-traffic conditions rather than as a fixed guideway capital project, the City will need to invest in facilities and technologies, as opportunities arise, required to deliver high-quality RT service.

**Core Service Area** – Within the urbanized area defined generally as west of Centennial Parkway, north of Lincoln Alexander Parkway, and east of the Chedoke Expressway, the transit system will consist of a high-frequency grid of north-south and east-west routes overlaying the one-kilometer grid of arterial and primary collector streets that predominate in much of metropolitan Hamilton. Service frequency on most weekday routes will be improved to every 10 minutes during peak times.

**Outlying Service Areas** – Existing service in Ancaster, Dundas, South Hamilton, Stoney Creek and Waterdown will be refocused to provide short-distance neighborhood and feeder trips to the nearest transit hub. Service frequency on weekday routes at peak times will be improved to every 15 minutes in most areas.

**Transit Priority Measures** - Implementation of transit priority measures will require a separate study to confirm the measures to be introduced and to prepare cost estimates and an implementation plan.

**New Transit Signal Priority Locations**

**King / Main James / John Streets Area**

The King/Main corridor between Queen St and Catharine St South, and the James St/John St corridor between King St and the Mountain.

This section of downtown Hamilton presents the greatest delay for transit vehicles due to general congestion of all vehicular traffic. In addition, it is in this area where passenger loads are highest, compounding delays through heavy boarding and alighting activity at closely spaced stops. Due to these conditions, the downtown corridors of King Street, Main Street, James Street, and John Street are prime candidates for the application of various transit priority measures.

The most effective measure that can be implemented along these corridors would be to provide bus-only lanes, particularly during peak periods. This would allow buses to bypass heavy traffic conditions and improve operating conditions and reliability. Many cities employ rush-hour only bus lanes by converting curb parking lanes.

Installation of signal priority will require that buses be equipped with CAD/AVL and transponder systems in order to activate signal priority only when running behind schedule. This system allows buses to extend the length of a green light,
or shorten the length of a red light, in order to reduce delay at heavy intersections.

**Lime Ridge Mall**

Considering the major role that the terminal is to play in the future with increases in service on the Mountain, it is imperative that the movement of transit vehicles be improved and prioritized at this location through a combination of active signal priority and physical priority measures.

**Upper James Street and Mohawk Road**

The intersection of these two main arterials creates significant delays at peak periods for both general traffic and buses. With the introduction of A-Line bus rapid transit on the Upper James corridor, the intersection of Upper James and Mohawk is a prime candidate to introduce transit priority measures to improve operation and to facilitate easy bus-to-bus transfers.

**To Improve Ridership and Mode Share**

Future ridership growth needs be in the 7% range annually over the next five years if HSR is to double ridership to 100 rides per capita within ten years. There is significant potential for ridership growth of this magnitude as transit’s main markets are experiencing growth, including the student, seniors and commuter markets, and higher parking and energy cost over the next five years should cause a switch to transit for the choice markets who are currently auto users

The objectives of this ridership goal are as follows:

- **Service penetration** – increase service use from 40 rides per capita (2006) to 50 rides per capita by 2014 as identified in the Transportation Master Plan.

- **Ridership** – increase annual revenue passengers from 21.8 million to 27.8 million by 2014.

- **Service Levels** – increase annual vehicle service hours to 806,910 by 2014.

**MARKETING SECTION**

The Transportation program requires a formal strategic marketing program, and needs to undertake detailed market segmentation work (i.e., regularly conducting telephone or web-based market research surveys or collecting focus group feedback, attitude or customer satisfaction ratings). As well, the program needs a specific and strong branding plan. The marketing efforts by other transit systems have significantly contributed to the ridership success on their branded BRT services and their overall transit systems. Examples include the iXpress in Waterloo Region, the VIVA service in York Region and Metrolink in Halifax Region.
Existing outreach activities are numerous, although there needs to be a clearer focus to these efforts.

**Expand employer pass program, undertake more travel smart initiatives, and introduce modifications to transit funding:**

TDM Co-ordinator should more aggressively market an Employer Pass to large employers such as the various medical centres and hospitals, research centres and others in the City of Hamilton.

**Establish and implement a transit park-and-ride strategy:**

Transit park-and-ride lots for transit riders near major transit terminals would encourage people from outlying areas to transfer to HSR for the remainder of their journey. Establishing permanent park-and-ride lots at the following locations can provide an opportunity for increased HSR ridership: Meadowlands; Eastgate Square; Mountain Transit Centre (HSR Facility); Elfrida; Winona

**Enhance HSR fare products:**

- Expand on the fare products its offers in order to develop new customers and markets and increase ridership:
- Promote the use of HSR Day Pass as a Guest or a Bus Buddy Pass to permit transit advocates to invite potential riders to try the transit system and to train them on how to use the system.
- Develop an Annual Pass for most classes of passengers to enable year-round transit commuters to pre-purchase their travel a year in advance to assist in financial planning and to provide the deepest discount available.
- Provide an Eco Pass/Community Pass to provide a discounted pass to large developments or to distinct communities (i.e., residential or business areas) where in return for a committed number of passes being purchased for a specified term (e.g. one to four years) as part of the development agreement or community agreement.
- Ensure basic features such as customer information and service are done well to provide solid foundation.
- Fares should be simplified, and the cost of a monthly pass should be cheaper relative to ticket prices.

Overall, HSR is viewed by many as a “social” service, or one that is aimed too much at students. This makes it difficult to market to workers or those making leisure-based trips. There needs to be a fundamental shift in thinking for both the City and the public so that transit becomes a mode as natural as taking the car.

**Marketing Plan**

An effective marketing, outreach and communications program should include the following activities:
analyze existing market data, including customer feedback, to determine trends, strengths and weaknesses as they pertain to marketing;
• collect new data where required;
• reach out to the non-riding public to determine perceptions and opportunities; develop a brand which helps to elevate council, media and public opinion of transit;
• develop and focus efforts and resources upon specific target markets; minimize the distractions from competing media that target these specific markets;
• develop education programs and/or materials to help key decision-makers understand the complexities of running an efficient and trusted public transit system;
• partner with pertinent city departments, public, not-for-profit and private organizations to market to target audiences in common;
• develop mechanisms for regular and effective interactions with media, partners and supporters of transit;
• measure marketing efforts (e.g. through ridership and the complaints system).

All of these areas could be improved with the help of a strong Marketing Plan to focus and prioritize activities. At the same time, appropriate resources (financial and personnel) need to be provided both for the short and the long term.

Advertising Revenues

StreetSeen Media has the contract for interior and exterior bus advertising. StreetSeen has just signed a new contract with the HSR for 5 years, ending in 2014. ViaCom (CBS Outdoor) has the contract for bus shelter advertising. Its contract with the HSR ends in 2015. Creative Outdoor Advertising has the contract for bench ads.

Brand/Corporate Image

For the City’s transit system to move into the future, now is the time to review the HSR brand from all perspectives, corporate and community. An outreach program to obtain feedback about the HSR could include surveys, focus groups, media articles and targeted advertising (such as on buses) with the Hamilton public, and especially with non-transit riders.

Partnerships

Additional partnerships include various contra promos with McMaster University (including a promo with McMaster to walk, bike or take transit), various contra promos with the seven different local BIAs along with joint campaigns with the Waterfront Trust, Environment Hamilton and Smart Commute.

A Marketing Plan, with a focus upon specific target markets and with a direct link to a strong HSR brand will help staff to determine which partnerships and events...
will offer the HSR maximum public and political outreach. Such a plan would also help to determine which partnerships are missing.

**Marketing Outreach through Print Materials**

**Route Maps**
The HSR Transit Guide presents all of the routes. The Transit Guide is updated every 18-24 months depending upon how often changes are made. Approximately 40,000 copies are printed and if a re-print is required 10,000 are generally re-printed at once.

**Individual Route Maps**
The HSR currently has 34 individual route maps. They are updated on an individual basis and are printed with the date. These are distributed in the same manner as the Transit Guide, but are also distributed at shopping malls and to the Wards that are pertinent to each route. The individual maps are also available on the buses in the “take one” slots. They are also posted on the website.

**Brochure**
A “Bus News” bulletin is produced primarily at schedule time changes. These brochures are distributed on buses and at the HSR ticket office.

Brochures for the fare vendors, for bike and bus riders, for seniors on how to travel safely, for environmental themes and for a variety of other items are created on an “as needed basis”.

An internal newsletter for employees is prepared three to four times per year. The purpose of this newsletter is to provide employees with a regular updates on plans, changes and activities concerning the HSR.

**Bus Advertising Cards**
*Bus Cards are produced on an “as needed basis” and are created to let riders know of changes in policy. Only unsold card space is used. The panel behind the driver’s seat is also used to share information about changes in the fare structure or for events such as Earth Week. External Bus Cards are produced on an “as needed basis”.*

**Shelter Materials**
HSR does not use shelter ad space, but does include copies of their full route maps on the walls of the shelters.

**Posters**
Posters are created and are distributed for special events.
Internal Printed Notices
These are produced for bus operators whenever changes are made as well as for general information regarding issues or events affecting HSR and employees.

Print Ads
Newspapers where the HSR posts ads include the Hamilton Spectator in the “At Your Service” section in the Community News newspapers in Hamilton, Stoney Creek, Ancaster, Binbrook, Dundas and Flamborough on an “as needed” basis.

Signage
Some bus stops include info posts with schedules. Some of the schedules are specific to each stop while others are more generic to the entire route.

Marketing Outreach through Electronic Materials
Web Site
The HSR pages are hosted within the City’s web site. Transit staff update the HSR portion of the site in-house. A staff member has the ability to create live updates without needing to go through a separate department to do this. The site includes a Trip Planner which gives scheduled time; the Trip Planner should become a live, “real time” tool. There are a number of ways to find information about HSR service. The site called www.myhamilton.ca is apparently not the official city site, yet it is the first site that comes up on Google searches when the keyword “HSR” is entered.

Recorded Phone Messages
Generally, the only recorded messages are for changes resulting from inclement weather. The Call Centre staff are responsible for looking after the recordings.

E-bulletins
The HSR does not produce e-bulletins for customers.

Customer Contact for One-on One Info & Complaints
Some information comes from customers and from councillors; other information arrives in the form of e-mail messages. The Customer Service Coordinator looks after these, along with phone and fax messages which relate to complaints. She enters the information into a database by date and decides upon which section will receive the information, in order to respond.

Call Centre
The Call Centre is open 365 days of the year, from 7:30 AM to 8:00 PM, with the exception of Christmas Day, when the Centre is open from 9:00 AM to 5:00 PM. The Centre averages 600 calls per week. There are 5 full time staff and 4 part time staff for the Call Centre. After closing hours, the Dispatcher can take calls

The activities within the Corporate Renewal strategy include:
Developing a new corporate image and identity (and possibly name) for the HSR. The image would include new logo, paint scheme and name.

Applying the new identity to all corporate materials and infrastructure (buses, stops, printed materials)

The activities within the **Current Customer Target**, in order of priority are:

- Map/Schedule Design, Printing and Distribution
- Schedule Update Printing/Distribution
- Web Site design and content
- Shelter Display Materials including maps and other customer information and promotional ads
- Customer Contact Program
- Customer Surveys
- Transit Theme Days

The activities within the **Prospective Customer Target**, in order of priority are:

- Route Branding – taking a specific route and developing an image or name – such as for the BRT services
- Student Transit Ambassador Program
- College Program
- Exterior and Interior Transit Specific Bus Cards
- Transit Specific Shelter Ads
- Mass Media Ad Campaign
- Niche Ridership Training Program

The activities within the **Public Relations Target**, in order of priority are:

- Contact list and program for regular contact with the media verbally or electronically
- Media Relations Kits
The activities within the Business and Political Target, in order of priority are:

- Regular consultation with key opinion leaders including attendance at business meetings
- One-on-one meetings with employers
- Meetings with medical and educational institutions

The activities within the Internal Strategy are:

- Staff Training
- Networking
- Communications, verbally, electronically and in posted bulletins

Together these activities demonstrate how comprehensive an effective marketing plan needs to be.

Policy - parking

Downtown Hamilton has a significant supply of low cost parking, which limits the potential of this area to attract people to transit. This parking situation should be partially addressed by adopting the comprehensive city parking management strategy and downtown parking strategy/by-law. This parking strategy could be used to further enhance City policies to improve the market for transit ridership by limiting the parking supply, raising the cost of parking, etc. As a general target, the cost of parking in the Downtown Core should not be less than the cost taking transit, which is not the case for most parking lots today.

FLEET SECTION

The City’s conventional transit (HSR) vehicle fleet consists of 217 buses as well as support vehicles for operations and maintenance. There are a further 66 buses for the specialized transit service (DARTS). The average fleet age is approximately 5.7 years. The fleet is in good mechanical condition and presents a clean, positive image of not only the transit system but of the City.

Maintenance of the HSR conventional bus fleet consists of two main activities:

- Daily cleaning and fuelling, exterior washing and periodic, more comprehensive, cleaning of each bus; and
- A scheduled maintenance and repair program.
The *daily vehicle cleaning* activity consists of exterior washing, interior cleaning and sanitizing, removal of garbage, sweeping floors, wiping seats, interior fittings, fuelling, checking and replenishing fluid levels, emptying fareboxes and downloading electronic data. This activity is intended to maintain a reasonable standard of cleanliness and hygiene. Maintaining a high level of vehicle cleanliness is important in attracting users to transit.

**INFRASTRUCTURE SECTION**

This section summarizes the required future investment in the City’s transit infrastructure, consisting of vehicle purchases for replacement as well as for service expansion, expansion of the transit centre, new or re-constructed terminals, bus stop designs and signage and additional shelters.

The base fleet replacement program identifies a requirement for 18 vehicles to be acquired annually based on the target 12-year replacement cycle. This represents an annual investment of approximately $8.1 million annually at an average unit cost of $450,000.

**Transit Centre/Garage**

All of HSR's administrative; operations, planning and vehicle maintenance functions are centralized in the Mountain Transit Centre located at 2200 Upper James Street. The specialized transit (DARTS) fleet and operations is located in a separate facility at 330 Wentworth Street North.

The Transit Centre was opened in 1983 and is approximately 250,000 square feet in size with indoor storage capacity for 200 12.2m buses. There is outdoor storage space for a further 20 vehicles. The Maintenance area includes sections for vehicle servicing (fuelling, washing, cleaning), inspections, component overhaul and major body repairs.

The practical capacity of the Mountain facility will be exceeded as the vehicle fleet will total 248 vehicles or over 260 units.

The City should undertake a longer review of its transit facility needs. Such study would identify in specific detail the City future transit fleet needs for a minimum horizon timeline of 25 years and consider the impact of introducing RT service and its corresponding operations and maintenance facility needs.

**Terminals**

There are currently five major transit terminals in Hamilton in addition to the GO centre terminal, located at: Gore Park; Lime Ridge Mall; Eastgate Square Mall; MacNab Street; Meadowlands. The transit terminals are in generally good condition and have suitable capacity to meet future operational needs. Additional terminals are needed near McMaster University as well as in the vicinity of Mohawk and West 5th Street, the latter linked to the new BRT line.
In addition to the five transit terminals, there are also five “loops” or route end points where several routes come together. As such, they serve as key transfer points or “terminus” points for routes.

**Bus Stops and Shelters**

Bus stop signage has become varied in its design and installation. There is a need to renew and up-date bus stop signage to enhance the image of transit service, and ensure signage is kept lean and free of graffiti.

**Bus Stops**

There are currently 2,100 bus stops located throughout the city. Bus stops are the sole method of accessing transit service for users. The stops and related signage serve three important functions in the operation of a transit system:

- “Advertise” to users where transit services exist;
- Indicate where users are to stand to access the transit service; and,
- Designate the spot where the bus operator is to stop.

**Passenger Shelters**

Passenger shelters are located at bus stops based on a needs basis, which factors in ridership levels, exposure to the elements, nature of the trip generator near the stop, and availability of land. There are 5xx shelters at bus stops throughout the transit service area.

The current number of shelters represents a coverage rate of approximately 26%. With the addition of 150 more shelters over the next 10 years, the rate will increase to 33%. Municipalities and their transit systems are generally moving to increase the bus stop/shelter coverage rate as part of a strategy to enhance the attractiveness of using transit, which recognizes the need to limit user exposure to the elements, regardless of the level of usage at a particular stop. The City should target a higher coverage rate for shelters of 40% in the short term with a target rate of 50% in the long term. This would represent in the short term, the installation of 147 additional shelters by the City over the next 5 years.

**CUSTOMER SERVICE SECTION**

HSR will need to continually improve the level and quality of service it provides customers. This effort will enable it to retain and increase the frequency of use by current riders and attract new riders.

The objectives of a service quality goal are as follows:

- **Schedule Adherence** - improve schedule adherence so that buses are on-time 95% of the time. Buses should never operate more than one minute ahead or more than 3 minutes behind schedule at identified time points.
• **Service Reliability** – achieve or maintain bus availability so that 99.9% of the scheduled service is delivered as a minimum.

• **Service Interruptions** - improve bus maintenance so that on-road service interruptions due to vehicle breakdowns do not exceed a maximum of 2 per 100,000 vehicle kilometres.

These objectives are to be accomplished by increasing on-road monitoring of schedule adherence, improving route and schedule design, and vehicle maintenance relative to breakdowns.
Appendix B3: Transportation and Health

Introduction

A transportation system that relies heavily on vehicles results in a number of negative health effects.

- Air pollution from vehicle emissions is linked with cardiovascular and respiratory disease.
- Increased traffic is a safety and injury concern, particularly for young children and seniors.
- Physical inactivity and a sedentary lifestyle can lead to obesity and an increased risk of chronic disease.

The following is a summary of the impact of increased vehicular use and its impact on health.

Air pollution:

The transportation sector is the highest emission source of carbon monoxide (CO), nitrogen oxide (NOx) and volatile organic compounds (VOCs) in Hamilton (Clean Air Hamilton, 2012). Air pollution is estimated to contribute to approximately 5900 deaths per year in eight Canadian cities (Quebec City, Montreal, Ottawa, Toronto, Hamilton, Windsor, Calgary and Vancouver). It leads to short-term and long-term effects on both the heart and lungs such as asthma and heart attacks. Each year, in Hamilton alone, air pollution is estimated to lead to over 100 premature deaths and over 700 respiratory and cardiovascular admissions. This is worsened by living, working, going to school or playing near arterial roads (Litman, 2012).

Figure 1: Sources of air pollution emissions in Hamilton, 2008 (Clean Air Hamilton 2011)
**Injuries and Safety:**

In addition to worsening air pollution, vehicular traffic also results in non-fatal and fatal injuries through motor-vehicle collisions, as well as pedestrian and cycling injuries. Young children and seniors are particularly vulnerable. Pedestrian injuries are one of the leading causes of injury-related deaths for children aged 14 years and younger (Safe Kids Canada, 2012). Senior pedestrians are at greater risk of death owing to vehicle-pedestrian collisions (Ramage-Morin, 2008). As the risk of physical injuries increases, concerns about safety also increase. Safety concerns are cited as one of the barriers in participating in physical activity, for walking or cycling. In one survey, more than one out of three parents (34%) listed “fear of injury” as a personal barrier for them. On behalf of their children, parents identified safety concerns as the highest deterrent for physical activity. Factors such as too much traffic and poorly maintained sidewalks and bike lanes (CFLRI, 2009) were cited as problems. A reliance on automobiles for transportation also results in reduced physical activity comprised of minimal walking to and from cars.

**Physical inactivity:**

Most Canadians are not physically active enough. The Canadian Health Measures Survey (using objective measures) found that 93% of Canadian children and youth (Colley et al., 2011a) and 85% of Canadian adults (Colley et al., 2011b) are not meeting recommended physical activity guidelines. Only 7% of Canadian children and youth and 15% of adults are meeting the physical activity guidelines.

Physical inactivity is a vital public health concern because it increases the risk of chronic diseases including obesity, cardiovascular disease, type 2 diabetes, some cancers, and obesity (Warburton, Nicol, & Bredin, 2006; McKinnon, Bowles, & Trowbridge, 2011). Over the past 30 years, obesity rates have steadily risen (Figure 2). It also represents a large economic burden in Canada. The economic toll in 2009 was estimated at $6.8 billion—$2.4 billion in direct health care costs and $4.3 billion in indirect costs (Janessen, 2012).
Investing in a strong transportation system

A strong transportation system, focusing on active transportation and public transit, would improve the health and well-being of a community and provide opportunities for all of its citizens. Public transit and active transportation improves air quality, reduces traffic related deaths and injuries and increases levels of physical activity. A strong transportation system allows for all citizens to access programs, services, educational and employment opportunities in an inclusive way.

What is active transportation?

According to the Public Health Agency of Canada (2010) active transportation refers to any form of human-powered transportation such as walking and cycling. Active transportation includes utilitarian trips (e.g., walking to school, work, or for errands), and recreational activity. Active and sustainable transportation includes transit users because each trip starts and ends with either walking or cycling, resulting in reduced single occupancy vehicle trips.
Improving air quality - health and environmental benefits

A strong active transportation system has fewer vehicles on the road because people are walking, cycling or using transit instead. This results in less air pollution and cleaner air. Higher air quality lowers rates of heart and lung diseases. The resulting environmental benefits are reduced energy consumption and reduced greenhouse gases (Reynolds et al., 2010), reduced noise, and improved water quality (Campbell & Wittgens, 2004).

Improving safety:

Fewer vehicles on the road reduces the incidence of motor vehicle collisions, and vehicle-induced pedestrian and cyclist injuries (Perrotta, 2011). In fact, public transit offers a safer mode of travel in comparison to other vehicles (Beck, Dillinger, & O'Neil, 2007) with 1/20th the fatality rate of car travel (Beck, Dillinger, & O’Neil, 2007). All users can benefit from complete streets policies that provide a safer road network, be they drivers, cyclists, pedestrians, or transit users.

Increasing Physical Activity:

An active transportation system, which supports walking, cycling and public transit would reduce levels of cardiovascular disease (e.g. heart attacks and strokes), type 2 diabetes and some cancers. Countries where more people walk, cycle and use public transit (rather than relying on cars) have lower rates of obesity (Figure 3). In addition, increased physical activity is associated with improved mental health and quality of life (Reynolds et al., 2010). Active transportation provides opportunities for physical activity that can contribute to modest increases in physical activity levels. Increased physical activity and healthier citizens can result in substantial health care cost savings.
Access, equity and citizen engagement:

The transportation network within a community is a powerful tool for all citizens to access opportunities for programs, services and other destinations that can enhance health, wellbeing, and simply improve overall quality of life. Many individuals and population groups rely on non-automobile options for transportation. For financial reasons, individuals with low incomes often lack access to automobiles (PolicyLink Prevention Institute, 2010). The elderly and individuals with physical limitations also drive less, relying on other transportation options (Turcotte, 2012).

Expanding mobility options for transportation would improve health equity outcomes. With a strong transportation network and ongoing infrastructure support, those for whom access to automobiles is limited, would enjoy easier access to health care for the purpose of both primary and secondary prevention. They would have wider opportunities for educational, training and employment services that can support entry into the workforce. A strong transportation network has the potential to attract more business to the community, and with new business comes more jobs. With greater employment opportunities comes fiscal independence, improved access to healthier food and lifestyle choices, better housing options, improved mental health and well being, with stronger familial and community ties and less dependence on negative coping strategies such as alcohol and other substances. A strong transportation system also provides easier access to social services, and allows citizens to connect with social networks with greater ease, all of which can support a higher functioning
citizenry. For newcomers to Canada, accessible transportation encourages community engagement, participation and acclimatization (World Health Organization, 2003a-h).

**Conclusion:**

The benefits of a strong transportation system are numerous, cumulative and create a domino effect within a community. The World Health Organization views transportation as a social determinant of health and recommends:

- Giving preference to cyclists and pedestrians on our roads
- Improving public transportation
- Restructuring incentives to financially support public transportation as opposed to roads, and increasing parking fees and penalties
- Changing land use to reduce the emphasis on car use (i.e. decrease parking spots and increase green space; increase cycling and bus lanes)
- Putting people and active living ahead of cars and convenience, and
- Increasing traffic restrictions (World Health Organization, 2003h).

Our infrastructure and city design must encourage active and sustainable transportation in order to improve the health of our community. An integrated, multi-modal transportation plan encourages both environmental and policy changes. The goals of this comprehensive transportation system will greatly influence the adoption of active transportation, healthier residents as well as a safer, healthier environment and more engaged community. It is also important to continue to recognize the relationship between the social determinants of health and transportation. Addressing health inequities through an accessible transportation network needs to be a priority.

Within the City, the continued collaboration across City Departments, and incorporation of the public health impacts into the planning and implementation of this multi-modal transportation plan is vital. This will continue to build on joint initiatives such as:

- Active and Safe Routes to School – including school travel planning and school siting and site design.
- Organization and delivery of the 2012 Transportation and ACT Summits.
- Open Streets events, which have successfully engaged our youth volunteers
- Grant submissions
- Support for submissions to planning tables such as the Healthy Kids Panel submission by Metrolinx related to expanded school travel planning.
References


Appendix B3:

Background Paper on the Intersection of Transportation and Health

(With a focus on older adults)

Prepared for the HSR

November, 2012

Prepared by

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Executive Summary

The purpose of this background paper is to consider transportation from a public health perspective. Using a review of the literature and publications from key websites, we discuss the health and well-being benefits of public and active transportation. Active transportation is any self propelled human-powered mode of transportation, such as walking or bicycling.

The transportation system of a city is a complex web of roads, transit, cycling and walking facilities that connect people to each other as well as to places of work, banking, play, shopping, community and health care. While transportation may not be thought of as a key determinant of health, transportation policies and accompanying land use patterns, planning and usage have far-reaching implications for both our physical and mental health as well as quality of life. While in many ways they improve our quality of life, research shows that land-use and transportation planning both directly and indirectly affect health and safety. Public transportation has a much less harmful effect on health than the use of automobiles with the emission of less pollutants and a lower risk of traffic fatalities and injuries.

The “walkability’ of neighbourhoods has a significant impact on the health and well-being of residents. Walkable neighborhoods encourage physical activity thereby promoting physical health, decreasing the likelihood of traffic and pedestrian fatalities, obesity, chronic diseases and improving cognitive functioning. Safety is one of the most significant concerns about walkability and a key predictor of walking behavior.

Public transportation and active transportation are indirectly linked to health by facilitating the participation of citizens in their communities. These transportation options improve access to goods and services, access to community and health services, connections to work, banking and leisure activities and promote connections to family and friends. Participation in community life is said to improve quality of life and hence indirectly improve the health and well-being of individuals and the communities in which they live.
As we redesign our cities to create healthy communities and age-friendly cities we have an opportunity to improve the health of individuals and communities. Transportation policies and land use patterns must become a vehicle to promote public health and to create an age friendly community that will allow people of all ages to participate and prosper. Doing so requires the development of accessible, efficient, affordable, and safe alternatives to automobile travel that can not only offset health impacts and costs, but generate health benefits. These alternatives enable people to walk, bicycle and use public transportation more, increasing their physical activity levels, their opportunities for participation, their access to jobs, their access to goods and services, and their access to health services thereby improving their physical and mental health, their quality of life and their overall health and well-being.
Introduction

The purpose of this background paper is to consider transportation from a public health perspective. Using a review of the literature and publications from key websites, we discuss the health and well-being benefits of public and active transportation.

The transportation system of a city is a complex web of roads, transit, cycling and walking facilities that connect people to each other as well as to places of work, banking, play, shopping, community and health care. The transportation system impacts more than just how Hamiltonians get from place to place, it influences physical activity, accessibility to goods and services, access to health services, engagement in leisure, social, cultural and spiritual activities in the community, as well as engagement with family and friends. While transportation may not be thought of as a key determinant of health, transportation policies and accompanying land use patterns, planning and usage have far-reaching implications for both our physical and mental health as well as quality of life. While in many ways they improve our quality of life, research shows that land-use and transportation planning both directly and indirectly affects health and safety by influencing the environment, physical and mental health and through facilitating social engagement in the community.

Mobility is fundamental to everyday life and is critical to health and well-being. Mobility has several different meanings. The term “mobility” is often used interchangeably with the term “transportation”; when addressing the issue of transportation it is best understood as the ability to move from one place to another, or between environments. It includes the use of an automobile, public transportation, other forms of passenger transport and active transportation.

Currently transportation, land-use patterns and planning favor a society that is auto dependent. Our dependence on automobiles and roadways has profound negative impacts on human health: decreased opportunities for physical activity, polluted air, pollution-related asthma, pedestrian injury, traffic accidents, and the risk of obesity and
chronic diseases that stem from sedentary lifestyles.\textsuperscript{1,2} Public transportation has a much less harmful effect on health than the use of automobiles. According to the American Public Health Association, public transportation produces 95\% less carbon monoxide, 45\% less carbon dioxide and 92\% fewer volatile organic compounds compared to private automobiles. Further the fatality rate associated with public transportation is approximately 1/25 of that associated with private automobiles.\textsuperscript{3}

Active Transportation is a concept employed in public health and health promotion strategies meaning public engagement in various modes of transportation involving some light-to-moderate physical activity. Active transportation is “any self propelled human-powered mode of transportation, such as walking or bicycling.”\textsuperscript{4} Active transportation is an essential component of mobile lifestyles that aid individuals in achieving health and well-being. Walking, cycling and the use of public transit (every trip begins and ends with a pedestrian or cycling activity) are forms of active transportation that promote individual as well as population health by providing exercise, reducing accidents, increasing social contact and reducing air pollution.\textsuperscript{5}

The Hamilton Master Transportation Plan published in 2007 guides transportation policies and strategies for the City of Hamilton.\textsuperscript{6} With the knowledge that walkable, bikeable, safe neighborhoods with convenient access to goods and services promote economic development and make cities more livable, the City of Hamilton is working to reduce the dependence on automobile transportation by providing accessible low-floor buses, increasing non-motorized forms of transportation such as walking and biking, and moving towards the implementation of “complete streets” which are roads that are designed and built to be accessible to all travellers regardless of mode, age, or capability.\textsuperscript{7,8}
A Public Health Perspective on Transportation

A healthy community is one that promotes healthy people by ensuring access to safe and nutritious foods, safe places to walk, run, or bike; clean air and water; adequate and accessible health care systems; and other healthy enablers. One of these healthy enablers is the transportation system (public and active).³

From a public health perspective, mobility is more than just an outcome or end point of policy; restrictions in mobility have consequences for the health and well-being of individuals and the health of populations. For example, accessible transportation and walkable communities can lower the disability threshold,⁵ increase physical activity, promote participation in the community and improve the health of individuals and populations on measures of physical and mental health as well as quality of life.⁴ For planners, the outcomes of active transportation, (participation, physical and mental health, access to goods and community and health services) that reduce health costs and care burden, are considered indirect effects of integrated, efficient, multi-faceted transit systems.

Transportation has been identified as one of the eight dimensions of an age-friendly city. An age-friendly city is an inclusive and accessible urban environment that promotes active aging.⁹ Other dimensions include, outdoor places and buildings, housing, social participation, respect and social inclusion, civic participation and employment, communication and information, and community support and health services. Transportation is part of the physical environment and access to transportation contributes to active aging, “the process of optimizing opportunities for health, participation and security to enhance the quality of life as people age”.⁵ Transportation promotes quality of life for older adults as it provides important opportunities for participation, civic engagement and employment, and respect and inclusion. Being able to move about the city determines access to community and health services, (i.e., doctor, dentist, hospital or specialized health services). Therefore,
barriers to transportation, including physical mobility issues or reliance on outside help for transportation, can limit people’s access to these services.\textsuperscript{10}

Policy makers have a vested interest in creating and maintaining opportunities for people to age well. As people age they are more likely to experience multiple chronic conditions that make it difficult to get around the community. Social isolation can further reduce an older adult’s quality of life and discourage older adults from participating in society, potentially contributing to a downward spiral of health problems leading to the increased and protracted utilization of health care resources. Healthy aging is an ongoing process of optimizing opportunities to maintain and enhance physical, social and mental health as well as independence and quality of life.\textsuperscript{10} Healthy aging is not just a seniors issue, it affects all age groups. Opportunities must exist, at all stages of life, for Canadians to maintain and enhance good physical, mental and social health. Transportation has been identified as a facilitator of healthy aging.\textsuperscript{10}

**Transportation Usage**

Most Canadians live in neighborhoods designed around cars as the means of travel. Central neighborhoods of large cities are the exception, since residents can more easily travel by public transit, on foot or bicycle. Most Canadians use a car as their primary means of travel. According to Statistics Canada, 79\% of men cite driving as their main form of transportation as compared to 44\% of women; whereas women were more likely to be passengers (41\%) compared to men (12\%).\textsuperscript{11} In terms of active transportation, Statistics Canada reports that about 6\% use public transportation, 4\% walk or bicycle as their main form of transportation.\textsuperscript{11} The use of a taxi or specialized transit for persons with disabilities is primarily used by those aged 85 years and over. For frail older persons specialized transportation or accessible taxis are the only feasible modes of transportation, other than getting a ride from others.
The proportion driving declines with age. At age 65 to 74, 84% of men and 53% of women cite driving as their main source of transportation as compared to 62% of men and 20% of women 85-89 years of age. As people get older, travelling as a passenger in a car becomes their main form of transportation; this was the case for about one-half of seniors aged 85 and over and was more common for women than men.\textsuperscript{11} The proportion who used public transit on an occasional basis (i.e., used at least once in the past month) is somewhat greater (for example, 19% for those age 65-74) however, walking and cycling were more popular than public transportation as an occasional means of transportation.\textsuperscript{11}

Use of public transportation does not increase with age as people become less likely or unable to drive. For example, 25% of women (who are more likely than men to use public transit) aged 55-64 reported taking public transit at least once in the last month, whereas only 18% of women 85+ said the same. This is because as people age they tend to leave home less often, they live in low density neighbourhoods where transit systems were designed to meet workers needs, there is a lack of accessible public transit especially outside of metropolitan areas or they are unaware of how to use the accessible features if they do exist.\textsuperscript{11}

\textbf{Safety}

Traffic injuries and fatalities (from vehicular crashes as well as bike and pedestrian accidents) are an enormous health problem.\textsuperscript{12} In 2010, the number of motor vehicle collision fatalities in Canada was 6.5 per 100,000 population and the number of injuries was 500 per 100,000.\textsuperscript{12} They are one of the leading causes of death for people ages 5-34. From 2000 through 2004, motor vehicle accidents accounted for 1.3% of all deaths in Canada, but 17.3% of all deaths among people younger than 30.\textsuperscript{13}

Compared to younger drivers, older drivers are at an increased crash risk per mile driven. According to a report by the Canadian Centre for Disease Control \textsuperscript{14} older drivers (ages 80 and older) have higher crash rates per mile driven than all but teen drivers.
Older drivers are more likely than younger drivers to die from injuries sustained in motor vehicle crashes. Pedestrian safety is an important concern for pedestrians and cyclists where roads have been designed to facilitate transport with multiple lanes, no sidewalks and distant and minimal crosswalks. Pedestrian collisions comprise between 12-14% of all fatalities from traffic accidents each year in Canada, compared to between 51-54% for drivers.¹⁴

For older adults, real or perceived safety is a significant factor to limit their mobility.¹⁵ Mobility patterns are affected and opportunities for activity are reduced when people feel unsafe (e.g., when waiting at a bus stop, or walking down the street or in a parking lot or through fear of crime).¹⁶ Opportunities to increase secure environments include safe pedestrian crossing, separate cycling paths for cyclists, good street lighting and attractive green spaces and streets. The more people integrate non-motorized travel into their daily routines, the lower the rate of fatalities from traffic accidents. Research conducted by The Victoria Transport Policy Institute in 2012 shows that in areas where more people walk, cycle and take the bus, the speed of vehicular traffic is slower and the damage experienced by a pedestrian hit at lower rates of speed is far less than in areas of high speed traffic flow.¹⁷

Fear of falling is also an important obstacle of mobility and this is most common for older people with a history of falls. It is estimated that one-in-three older adults have a fall in any one year.¹⁸ Falls among older people are significant and growing cause of injury and often result in emergency room visits, hospitalization, placement in a nursing home and death. Environmental hazards that increase the risk of falling include irregular walking surfaces, lack of supportive handrails, poor lighting, and rest areas without bench seating. Creating age-friendly outdoor spaces will address older adult’s fear of falling, promote active transportation, and reduce the number of visits to emergency rooms, hospital admissions, nursing home placements and even death.¹⁸
Active Transportation Promotes Physical Health

The importance and benefits derived from physical activity for public health is still emerging but the consensus is that physical inactivity contributes to obesity and increased risk of many chronic diseases and health conditions. Obesity is a growing problem. Around one-quarter of Canadians aged 18 and older are obese putting them at risk for diseases such as diabetes, hypertension, cardiovascular disease, gout, gallstones, fatty liver and some cancers. There is mounting evidence that active transportation (i.e., walking and cycling, including to and from public transportation) may have beneficial effects on health as they involve physical activity. Physical activity plays an important role in preventing illness and dependence through improved cardiovascular health, physical fitness, and decreased levels of obesity.

Obesity in children is a growing health risk and many obese and overweight children are at risk of chronic illnesses such as Type II Diabetes. Many experts believe that walking and bicycling are the most practical ways to increase physical activity for children and adults. However, rates of active transportation such as walking and bicycling to and from school has declined dramatically over the past thirty years as more and more children are bused to school. While distance is the primary reason that many children take the bus or are driven to school, implementing safe routes to schools (i.e., safer and fully accessible crossings, walkways, trails and bikeways) in the U.S. has shown to increase walking and bicycling to schools in the range of 20 to 200 percent with safety improvements of up to 49% in participating programs.

Physical inactivity is also a major contributor to chronic illnesses such as Type II diabetes and heart disease. As people grow older their risk of chronic health problems increase; more than half of those 65 and over suffer from one or more chronic health problems, the most common being musculoskeletal conditions (including arthritis), high blood pressure, back problems, heart disease and diabetes. Research shows that regular, moderate physical activity can reduce the onset of chronic
diseases, reduce the risk of cardiac death, and reduce the severity of disabilities associated with heart disease and other chronic illnesses.\textsuperscript{5, 10, 20}

Data from the Canadian Community Health Survey showed that only half (51\%) of Canadians aged 12 and over were active or moderately active.\textsuperscript{22} Studies show that 30 minutes per day of moderate-intensity physical activity provides significant health benefits. The Public Health Agency of Canada recommends 2.5 hours of moderate to vigorous aerobic exercise per week to promote health and well-being and quality of life.\textsuperscript{24} This could be achieved by integrating active transportation into daily routines.

Studies in European countries have shown that higher rates of walking and cycling as the most common modes of transportation are linked to overall lower rates of obesity and associated illnesses than in countries where such modes of transportation are less common.\textsuperscript{20} In a cross sectional analysis of health and travel data from 14 countries (including Canada, European, US and Australia), all 50 US states and 47 of the 50 largest cities in the US, Pucher and colleagues investigated the relationship between active transportation, physical activity and physical health (particularly obesity and diabetes) for the adult population.\textsuperscript{20} Their research showed a positive relationship between walking, cycling and health at the country, state and city levels. Higher rates of walking and cycling, were significantly related to lower rates of obesity in all countries under investigation. Other studies suggests that neighborhood walkability is associated with significant health effects, including more physical activity, less cardiovascular disease and less obesity.\textsuperscript{25, 26, 27} Thus this research provides convincing evidence for the relationship between active transportation, physical activity and health.

**Active Transportation Promotes Cognitive Health**

There is growing evidence that physical activity plays an important role in enhancing cognitive functioning for older adults and can combat depression. The Public Health Agency of Canada estimates that about 20\% of community dwelling older adults have some form of mental illness, the most common include Alzheimer’s disease and other
dementias, depression and delirium. Among seniors living in the community it is estimated that about 5% have a diagnosed depression.\textsuperscript{10} Depression can lead to higher mortality and morbidity from other diseases such as cardiac disease, stroke and chronic pain. Physical activity has been shown to be inversely related to depression in older persons.\textsuperscript{27} A study by Berke and colleagues report that in older men, walkable neighborhoods can provide a buffer or protect against depressive symptoms, over and above the role played by physical activity.\textsuperscript{27}

Evidence is accumulating that physical exercise benefits the brain through enhancing cognitive performance and can even benefit those who have a cognitive impairment or dementia. Colcombe and Kramer analyzed the results of 10 scientific studies between 2000 and 2004 and their results showed that fitness training increases cognitive performance in healthy adults between the ages of 55 and 80.\textsuperscript{29} Heyn and colleagues also reviewed many studies to conclude that exercise training showed beneficial effects on the cognitive function of seniors with cognitive impairment.\textsuperscript{30} Most recent evidence suggests that physical exercise benefits the brain by preventing brain shrinkage which is linked to cognitive decline (i.e., problems with thinking and memory) and is linked to Alzheimer’s.\textsuperscript{31} Promoting opportunities for active transportation, then, will have a beneficial effect on cognitive and mental health through providing more opportunities for physical activity.

**Transportation, Participation, Quality of Life and Health**

Participation is defined as actions and tasks required to engage in organized social life and includes involvement in community life, recreation and leisure, and in religion and spirituality.\textsuperscript{32} Research reveals that participation is an important element to quality of life.\textsuperscript{5 7 33} The ability to “get out and about” is a key element of quality of life.\textsuperscript{34 35} Participation is a result of the fit between the person’s characteristics and his/her environment, factors that act as either facilitators or barriers.
Transportation directly impacts participation by facilitating connections between persons and the environment in which they live. Integrated transportation options and walkable neighbourhoods connect individuals to goods and services in their community (i.e., shopping, restaurants etc.). Being able to move about the city determines access to community and health services (i.e., doctor, dentist, hospital or specialized health services). Barriers to transportation including physical mobility issues or reliance on outside help for transportation can limit people’s access to these important services and contribute to unmet health care needs.

Transportation has an indirect impact on health through participation. Studies demonstrate that participation is associated with a number of health indicators including mortality, depression, disability, cognitive performance and dementia, self-rated health, psychological distress and a decrease in overall general health and well being. When barriers to transportation limit participation, the health and well-being of individuals and populations are impacted.

Most people want to be able to grow old in their own homes (i.e., age in place). However, when transportation is unavailable, older adults tend to limit their participation. Participation among older adults involves both daily activities required for survival (e.g., nutrition, personal care, mobility, communication) and the social roles necessary for adult’s quality of life. An analysis of the Canadian Community Health Survey- Healthy Aging revealed that inadequate access to transportation or difficulties getting around the neighbourhood created barriers to participation especially for older women. As noted by Turcotte “seniors, whose main form of transportation was driving their car were the most likely to have taken part in a social activity during the previous week (73%), with passengers who had a driver’s license close behind (69%). Public transit users and seniors who walked were little less likely to participate (61% and 66% respectively). People who were mainly passengers and did not have a license (53%) and people who used accessible transit or taxis (46%) had the lowest participation rates” (p. 14).
In a recent study of seniors living in Greater Montreal participants were asked to rate their level of participation in 30 activities as ‘regular, occasional or never’. Level of participation was highest among drivers, walkers and users of public transit, compared to those who were passengers, or users of taxis and other assistive transport services. This is thought to be the result of “loss of spontaneity in transportation” among those experiencing greater impairment (p. 497). A second Montreal study examined neighborhood correlates of participation among older adults. Measures of participation included 10 categories ranging from visiting with family members and friends, volunteer work to going shopping, to the public library or cultural events etc. Levels of participation were higher for respondents who walked frequently, who had a positive perception of the walkability of their neighbourhoods, who used public transportation (at least once a week) than those with a driver’s license and those who had a motor vehicle in the household.

In summary, transportation directly impacts individuals and families ability to participate and play an active role in the community. Participation promotes social connectives, thereby providing an indirect impact on the health and well-being of individuals and communities.

**Transportation & Disability**

While 14% of all Canadians report a disability, disability is more common among the older population with 23% of those 55 to 64 and 43% of those 65 and over reporting a disability. The World Health Organization defines disability as impairment, activity limitation or participation restriction that is a result of the interaction between the contextual factor (personal and environmental) and the health condition. Disability may emerge from barriers in the environment that prevent individuals from engaging with the community for work or leisure, including lack of accessible transportation. Further barriers in the environment such as uneven sidewalks, or lack of curb cuts can limit mobility and hinder transportation. Accessible public transportation, specialized transit
and age-friendly outdoor spaces permit persons with a physical limitation to be mobile and reduce the number of persons with a disability in the community.\textsuperscript{47} A study by White and colleagues surveyed 436 people with functional limitations due to osteoarthritis to study the relationship of features of the neighborhood environment and disability. Their study revealed that walking areas, adequate handicapped parking and public transportation play an important role in facilitating working, volunteering and in recreational and social activity as well as general physical activity.\textsuperscript{46} The Province of Ontario has recognized the disadvantages persons with disabilities face in being full participants in community life and are implementing the Accessibility for Persons with Disabilities Act (AODA) to create transportation and built environment standards that are more accessible to persons with a disability.

**Conclusions**

A growing body of evidence suggests that planning the built environment to promote physical activity (such as through infrastructure for walking, cycling, availability of public transit, connectivity, housing density and mixed land use) may influence the likelihood that people will use active transportation for daily travel.\textsuperscript{47} The “walkability” of neighbourhoods can have a significant impact on the health and well-being of residents. Walkable neighborhoods encourage physical activity thereby promoting physical health, decreasing the likelihood of obesity and chronic diseases and improve cognitive functioning. Walking is more common in neighborhoods with older homes, such as those built before WWII (i.e., communities where there are more likely sidewalks, denser, grid road patterns and mixed business/residential land use).\textsuperscript{48} Safety (street traffic safe crossings, fear of crime) is one of the most significant concerns about walkability and a key predictor of walking behavior for older adults.

Public transportation and active transportation are indirectly linked to improved health by facilitating the participation of citizens in their communities. They improve access to goods and services, community and health services, connections to work and leisure activities and promote connections to family and friends. Active participation and engagement in community life improves quality of life and hence the health and well-
being of individuals and the communities in which they live. As we face the aging of the population and the expected increase to health care expenditures, transportation policies and programs to improve the health of individuals and populations will help to offset health impacts and costs.

Our current transportation networks and systems and community designs were planned when little was known about the impact of the environment on health. As we redesign our cities to create healthy communities and age-friendly cities we have an opportunity to improve the health of individuals and communities. Transportation policies and land use planning must become a vehicle to promote public health and to create an age friendly community that will allow everyone of all ages to participate and prosper. It requires the development of accessible, efficient, affordable, and safe alternatives to automobile travel that can not only offset health impacts and costs, but generate health benefits. These alternatives enable people to walk, bicycle and use public transportation more, increasing their physical activity levels, their opportunities for participation, their access to jobs, their access to goods and services, and their access to health services thereby improving their physical and mental health, their quality of life and their overall health and well-being.
References


