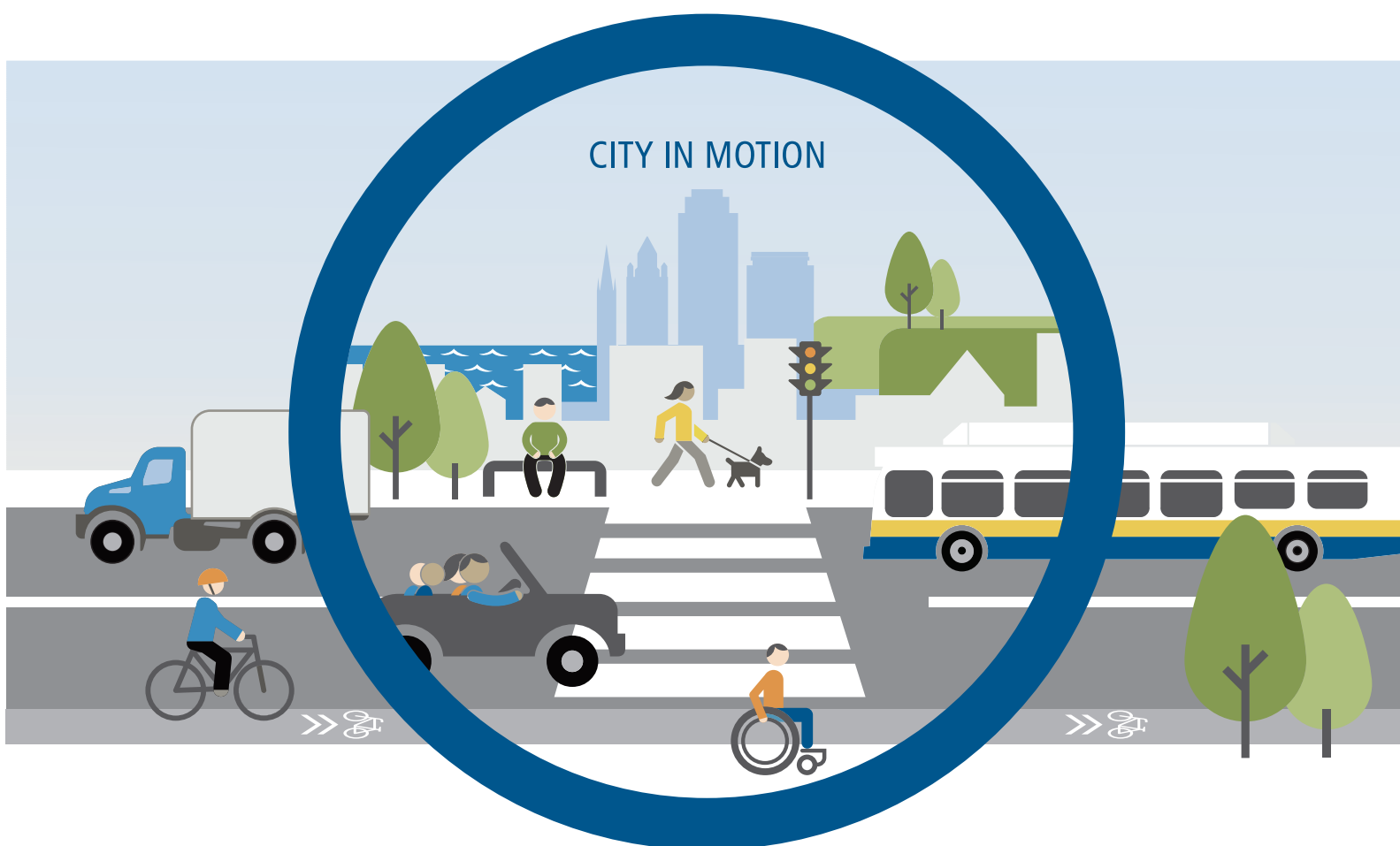




Hamilton

CITY OF HAMILTON **TRANSPORTATION MASTER PLAN** REVIEW AND UPDATE



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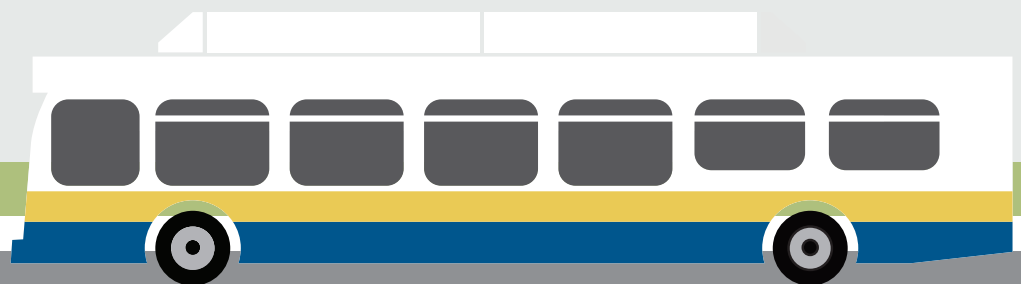
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Executive Summary: City in Motion

The Transportation Master Plan: City in Motion (TMP) is a comprehensive review and update of the 2007 TMP that continues to plan and build for the 2031 planning horizon and beyond. Ultimately, the City of Hamilton (the “City”) is working toward achieving positive outcomes that align with the City’s strategic plan and vision to be the best place to raise a child and age successfully.

The TMP review and update was undertaken according to the Municipal Class Environmental Assessment (EA) process (Municipal Engineers Association (MEA), October 2000, as amended in 2007, 2011, and 2015) for Master Plans (Approach 1). It is a strategic planning framework that provides direction for future transportation-related studies, projects, initiatives and decisions.

The TMP is a multi-modal plan addressing all modes including walking, cycling, transit, automobiles and goods movement.

CATALYST FOR CHANGE (PROBLEM STATEMENT)

Hamilton’s population is anticipated to grow approximately 22.9% between 2016 and 2031, and employment is expected to increase by approximately 23.4% between 2011 and 2031 (see Table ES.1).

TABLE ES.1
Population and Employment Trends in the City of Hamilton*, 2001 to 2031

	2001	2006	2011	2016	2031 ¹ (Projected)
Population ²	490,260	504,560	519,949	536,917	660,000
Employment	204,912	219,200 ³	243,075	259,070**	300,000

* City of Hamilton only (not Hamilton Census Metropolitan Area)

** Statistics Canada 2016 census data for Place of Work

¹ GRIDS Growth Report, Section 1.4, Table 1 (2006). The City is currently undergoing a land budgeting process to accommodate the Province of Ontario’s Places to Grow: Growth Plan for the Greater Golden Horseshoe (2017) (Growth Plan) forecast.

² Statistics Canada (2001, 2006, 2016) Census Data

³ Table 3 Hamilton Employment Area Land Budget Update (2009)

Changing demographics have been, and will continue to be, an important driver of change. If current mode share trends continue, automobile trips can be expected to grow at the same rate as population growth. However, it is not sustainable, or in many locations physically feasible, to widen roads to match growth in auto trips that would occur under a business as usual scenario. As a result, the key challenge for this TMP is how to accommodate growth while ensuring the transportation system is able to operate efficiently and that the goals for safer roads, environmental protection, economic development and health are met.

While Hamilton's population is growing, it is also shifting. According to the most recent Statistics Canada data, the population of Hamilton residents aged 60 years and older increased by 27.5% over the last 10 years. During that same timespan, the number of youth aged 19 years and under reduced by 4.4%. The resulting mobility needs associated with the aging population necessitates a change in the design and accessibility of transportation infrastructure and services.

VISION (OPPORTUNITY STATEMENT)

There is an increased expectation for transparency, accountability, communication, public participation and engagement in government decision-making. An important step in the TMP review and update was to engage the public on whether the vision, transportation priorities and TMP goals identified in the 2007 plan were still valid. Input received from the public reflects the changing values of the community (consistent with the Our Future Hamilton process).

A revised vision for transportation in the City was established that reflects the priorities of its citizens and the City's strategic plan and objectives. It reads as follows:

“To provide a comprehensive and attainable transportation blueprint for Hamilton as a whole that balances all modes of transportation to become a healthier city. The success of the plan will be based on specific, measurable, achievable, relevant and programmed results.”

DESIRED OUTCOMES

The revised vision identified in the TMP review and update is closely aligned with the City's Strategic Plan. The Strategic Plan provided guidance on how the TMP planning process was undertaken. Three desired outcomes for the transportation system were identified through the TMP review and update process and relate to four of the seven City Strategic Plan priorities, as shown in Table ES.2.

TABLE ES.2
Relationship
of the
2016-2025
Strategic
Plan Priorities
and the
TMP Review
and Update
Desired
Outcomes

Related 2016-2025 Strategic Plan Priorities	TMP Review and Update Desired Outcomes
Built Environment and Infrastructure, Healthy and Safe Communities and Clean and Green	Sustainable and Balanced Transportation System (Chapter 4)
Healthy and Safe Communities, Clean and Green	Healthy and Safe Communities (Chapter 5)
Economic Prosperity and Growth	Economic Prosperity and Growth (Chapter 6)

Achieving these desired outcomes requires strategies that extend well beyond investing in infrastructure. This TMP addresses all aspects of an integrated transportation system and is structured around the following elements:

Sustainable and Balanced Transportation System:

- Active transportation
- Climate change
- Complete-Livable Better Streets
- Emerging technology
- Intergovernmental relations
- Roads
- Street conversions (one to two way)
- Sustainable mobility
- Transit

Healthy and Safe Communities:

- Accessibility and age-friendly
- Health and the built environment
- Road safety (Vision Zero)

Economic Prosperity and Growth:

- Economic development
- Goods movement
- Land-use and travel patterns
- Parking

ACTIONS

The 2007 TMP included an extensive set of policies to guide the planning, design and operation of the transportation system. As part of this TMP review and update, these policies were reviewed, updated and enhanced to reflect current best practices and the renewed vision for transportation. The renewed policies and related actions are reflected in this TMP.

New or strengthened areas of focus include:

- Complete-Liveable-Better Streets
- Connectivity and improving access between different areas of the City
- Emerging technologies
- One-way to two-way street conversions
- Road safety and the concept of "Vision Zero"

Table ES.3 provides a summary of the actions contained in this TMP. They are described more fully in the subsequent chapters.

TABLE ES.3 Summary of Actions

Policy Theme	No	Actions	Timing	Lead (Partners)
Sustainable Mobility (TDM)	1	Expand the reach and effectiveness of current Sustainability Mobility programs (Transportation Demand Management, TDM) to help achieve mode shift targets. This includes continued application of the TDM and Land Development Guidelines as part of development approvals.	Ongoing	PED (HSC)
	2	As part of future Official Plan and zoning by-law amendments, integrate TDM requirements such as end-of-trip facilities, car share, and public bike share.	Ongoing	PED
	3	Expand Smart Commute services to include a wider range of businesses and geographic coverage.	Short	PED (Metrolinx, NGOs)
	5	Apply individualized marketing (IM) and community-based social marketing (CBSM) as part of Sustainable Mobility programs.	Short	PED
	5	Coordinate School Travel Plans for every elementary school in the Hamilton-Wentworth District School Board (HWDSB) and Hamilton-Wentworth Catholic District School Board (HWCDSD) by 2022 in partnership with Healthy and Safe Communities (HSC), the Hamilton Strategic Road Safety Program, other City departments and local schools to identify safety and TDM opportunities.	Medium	PED (HSC, PW, local school boards)
Active Transportation	6	Update the prioritization framework for the Sidewalk Extension Program and establish an annual capital budget to address outstanding gaps based on community input.	Medium	PW (PED)

TABLE ES.3 Summary of Actions

Policy Theme	No	Actions	Timing	Lead (Partners)
Active Transportation	7	Integrate walking infrastructure needs into the City's 10 Year Capital Budget so that opportunities for seamless, lower-cost development of pedestrian infrastructure is captured.	Ongoing	PW/PED
	8	Work across departments and in conjunction with developers and other stakeholders to enhance the walking environment through streetscaping measures and addition of amenities such as benches, street trees, public art, wayfinding.	Ongoing	PED/PW
	9	Work with the Hamilton Burlington Trails Council and neighbouring municipalities to advance the development of a greenway network within the natural, rural and urban areas of the City.	Long	PED (HSC)
	10	Create a business plan for the phased expansion of the public bike share and continue to enhance the system to connect with transit.	Short	PED
	11	Monitor, and where appropriate, enhance the maintenance program for pedestrian and cycling facilities (on- and off-road).	Ongoing	PW (on-road); Parks (off-road)
	12	Expand the existing City-wide wayfinding system to include the upper City and the former municipalities.	Medium	PED (PW)
Cycling Master Plan Review and Update	13	Maintain an annual capital budget for the implementation of the updated Cycling Master Plan and associated facilities.	Ongoing	PED

TABLE ES.3 Summary of Actions

Policy Theme	No	Actions	Timing	Lead (Partners)
Cycling Master Plan Review and Update	14	Integrate cycling infrastructure needs into the 10 Year Capital Budget for all road reconstruction, rehabilitation and new roads as guided by the updated Cycling Master Plan, with an emphasis on achieving physical separation.	Ongoing	PW (PED)
	15	As part of the implementation of the cycling network, undertake an evaluation of alternatives in order to select routes which maximize safety for cyclists and promote continuity of the network across the City.	Ongoing	PED
Transit	16	Continue to advance planning for the implementation of the rapid transit network, as identified in Map 2.	Ongoing	PED (PW, Metrolinx)
	17	Ensure seamless connections between the City's rapid transit network and the regional transit network.	Ongoing	PED (PW, Metrolinx)
	18	Work with Metrolinx to advance designs and supporting business cases for remaining rapid transit corridors and extensions.	Long	PED (PW, Metrolinx)
	19	Advocate Metrolinx to accelerate the plans to provide two-way all day service on Lakeshore West to Hamilton, with extensions to Niagara Region, by 2020.	Short	PED (PW)
	20	Work with Metrolinx, neighbouring municipalities, post-secondary institutions and major employment destinations on regional transit connectivity.	Medium	PW

TABLE ES.3 Summary of Actions

Policy Theme	No	Actions	Timing	Lead (Partners)
Transit	21	Review the cost, benefits and implementation feasibility for a demand-responsive service model that could provide transit service for lower-density areas which complement the existing HSR and regional transit networks. Demand-responsive service could also serve as a replacement for lower performing routes which do not meet service performance standards.	Long	PW
	22	Investigate the feasibility of early service agreements for new developments that would facilitate the implementation of transit in conjunction with new development. This could be extended to include transit service enhancements where service already exists.	Long	PED
	23	As part of ongoing traffic operation enhancements, road reconstruction and implementation of the rapid transit network, deliver a program of transit priority measures including reserved bus lanes, transit priority signals, queue jump lanes and other measures to improve the efficiency of transit. Priority will be given to the BLAST network.	Medium	PW
	24	Undertake comprehensive reviews of the HSR route network and service strategies at regular intervals (every five years) to ensure that the transit system adapts and growth with changing growth patterns.	Short	PW

TABLE ES.3 Summary of Actions

Policy Theme	No	Actions	Timing	Lead (Partners)
Transit	25	Advance initiatives to continue to enhance the customer experience for transit including en route Wi-Fi, enhanced stops and shelters and enhanced real-time information.	Ongoing	PW
	26	Continue to work with neighbouring municipal transit agencies on fare integration, and advocate for Metrolinx to advance the development of an equitable regional fare integration strategy that does not adversely affect HSR ridership and revenues.	Medium	PW
Roads	27	Over time, move to a managed lane approach for Hamilton’s parkway roads, including High Occupancy Vehicle (HOV) lanes, access control measures and other approaches that maximize existing capacity. Thresholds will be developed to assign capacity by mode to maximize throughput.	Long	PW
	28	Continue to advocate for provincial highway network improvements. The first priority for Hamilton is addressing congestion on Highway 403 through a Highway 403 Connections Study.	Medium	PED
	29	Continue to invest in and expand on the existing Advanced Traffic Management System (ATMS) within the City.	Ongoing	PW
	30	Proactively anticipate the impacts and opportunities related to connected and autonomous vehicles (AVs) on the operation of the road network.	Ongoing	PW

TABLE ES.3 Summary of Actions

Policy Theme	No	Actions	Timing	Lead (Partners)
Roads	31	Implement the road network improvements as illustrated on Map 3 and in conjunction with applicable Secondary Plans, EA studies and area-specific transportation management plans. Timing of road improvements has been identified in Appendix A and will be subject to ongoing capital plan updates.	Ongoing	PW (PED)
	32	Continue to implement intersection modifications on an ongoing basis to address road network bottlenecks and improve safety for all users.	Ongoing	PW
	33	Adopt best practices for roadway and bridge design to respond to changing climate and frequency of extreme weather events.	Short	PW
	34	Work with Metrolinx and railway companies to plan and implement required railway grade separations based on applicable warrants. Pursue external funding sources, including the Transport Canada Rail Safety Improvement Program, for the construction of such crossings.	Medium	PED (Metrolinx, railway companies, Transport Canada)
Complete-Livable-Better (CLB) Streets	35	Adopt a CLB streets policy for road design, operation and maintenance. The CLB streets approach emphasizes routine accommodation in order to ensure designs consider the needs of users of all ages and abilities.	Short	PED
	36	Develop a CLB streets design manual for each typology, harmonizing existing applicable guidelines. A Vision Zero lens will be applied to the design of streets in new neighbourhoods and redesign of streets in existing neighborhoods.	Short	PED

TABLE ES.3 Summary of Actions

Policy Theme	No	Actions	Timing	Lead (Partners)
Complete-Livable-Better (CLB) Streets	37	Harmonize the road classification and descriptions in the Official Plan with the CLB streets approach and undertake an Official Plan Amendment.	Medium	PED
	38	Use the multi-modal level of service (MMLOS) approach to evaluate road designs and facilitate the implementation of CLB streets. The MMLOS approach will also be integrated into Transportation Impact Study Guidelines as part of a major update to these guidelines (see Action 57).	Short	PED
	39	Integrate stormwater management Low Impact Development (LID) opportunities as part of CLB Streets designs where feasible.	Ongoing	PW (PED)
	40	Provide paved shoulders on rural roads where cycling is prevalent and/or where paved shoulders could benefit farm vehicles.	Ongoing	PW (PED)
	41	Evaluate options for providing sidewalks or multi-use trails in rural areas where the road leads to a school or community facility.	Ongoing	PW (PED)
One to Two-Way Street Conversions	42	Operationalize the one-way to two-way decision making framework identified in this TMP. Consider street conversions as a potential alternative within CLB streets evaluation.	Short	PW
Connectivity	43	Initiate a study to identify improvements to existing Niagara Escarpment crossings and methods and alternatives to move people and goods in a cost effective manner.	Long	PW (PED, Niagara Escarpment Commission)

TABLE ES.3 Summary of Actions

Policy Theme	No	Actions	Timing	Lead (Partners)
Connectivity	44	Maximize the coordination and connectivity of bicycle, pedestrian and transit networks (including public bike share) to improve first and last mile connections to transit.	Ongoing	PED/PW
Climate Change	45	Promote the importance of reducing GHG emissions from transportation, managing fleet operating costs and achieving the City's Corporate Average Fuel Economy (CAFÉ) targets energy conservation in transportation and ensure Hamilton plays a role in achieving Federal, Provincial and its own commitments to reduce GHG emission reductions.	Ongoing	PW
Emerging Technology	46	Identify opportunities for and run pilot projects to assess the applicability and/or feasibility of implementing new technological opportunities, such as mobility as a service.	Ongoing	PW/PED
	47	Work across departments to use "Big Data" to inform transportation planning decisions, provide better services for the travelling public and reduce net costs.	Short	Corporate Services
	48	Support the transformation of the transportation system to create a "smart city" (intelligent community).	Medium	Corporate Services
Intergovernmental Relations	49	Proactively work with the Ministry of Transportation (MTO), Metrolinx, other provincial/federal agencies and neighbouring municipalities to advance regional transportation initiatives within and beyond the City.	Ongoing	Multiple leads

TABLE ES.3 Summary of Actions

Policy Theme	No	Actions	Timing	Lead (Partners)
Health and the Built Environment	50	Include health outcomes (chronic disease, respiratory function, injuries, mental health, and health care costs), where possible, in the evaluation of transportation designs, projects and policies, in collaboration with Public Health staff and professionals.	Ongoing	HSC
Road Safety	51	Integrate the goals and principles of Vision Zero into the CLB streets design manual and Engineering Guidelines.	Short	PED
	52	Establish a Vision Zero Task Force that includes multiple partners, leaders, public and private businesses, school boards and public health as a sub-committee to the Hamilton Strategic Road Safety Committee.	Short	PW
	53	Implement a comprehensive collision data collection system integrating multiple modes of transportation and overlaying built environment data.	Ongoing	PW
	54	Apply speed reduction techniques through the implementation of CLB streets as well as through other opportunities such as the introduction of protected cycling facilities.	Ongoing	PW (PED)
Accessibility	55	Support the delivery of age-friendly and accessible transit training and training for other modes run by non-governmental organizations.	Short	PED (HSC, PW, NGOs)
	56	Develop education around sidewalk etiquette and the role of mobility devices.	Short	PED (HSC)

TABLE ES.3 Summary of Actions

Policy Theme	No	Actions	Timing	Lead (Partners)
Land Use and Travel Patterns	57	Update the Transportation Impact Study Guidelines to include the concept of multi-modal level of service (MMLoS) which allows for the evaluation of LOS for pedestrian, cycling, transit and goods movement LOS, in addition to traditional auto LOS. MMLoS is one tool to inform trade-offs between modes.	Short	PED
	58	Update Road Right-of-Way policies within the Official Plan to ensure that future development protects for future multi-modal capacity needs, municipal services and utilities, while adhering to the principles of CLB streets and Vision Zero.	Short	PED (PW)
Parking	59	Undertake a city-wide Parking Master Plan, which will develop short-, medium- and long-term plans for the parking system, including both off-street and on-street parking. The Parking Master Plan will inform future updates of the zoning by-law governing the provision of parking for new development.	Short	PED
	60	Integrate the requirement to provide electric vehicle (EV) charging stations as part of future zoning by-law amendments.	Short	PED
	61	Expand existing EV charging and parking stations to create a network within all municipally-owned facilities, including public parking lots.	Ongoing	PED (PW)

TABLE ES.3 Summary of Actions

Policy Theme	No	Actions	Timing	Lead (Partners)
Parking	62	Adopt off-street and on-street parking policies and designs that ensure an adequate parking supply to support growth and economic development, contribute to the achievement of the mode share targets of the TMP, and implement the CLB streets and Vision Zero objectives of the TMP.	Ongoing	PED
	63	Evolve the Hamilton Municipal Parking System to support the increasing use of shared mobility such as carshare and other shared mobility options and, where applicable, park and ride.	Long	PED
Economic Development	64	Provide multi-modal access to/from and within employment lands.	Ongoing	PW/PED
Goods Movement	65	Undertake an integrated review and update of the 2010 Truck Route Master Plan and 2005 Goods Movement Study.	Short	PED (PW)

TABLE ES.3 Summary of Actions

Policy Theme	No	Actions	Timing	Lead (Partners)
Implementation	66	Create in-house transportation modelling and data analysis capacity to support transportation decision and planning needs, and the monitoring of TMP outcomes.	Short	PED
	67	Update the City's travel demand forecast to reflect the updates from the revised Growth Related Integrated Development Strategy (GRIDS).	Short	PED
	68	Implement the proposed monitoring program for the TMP and report to Council on a regular basis.	Ongoing	PED
	69	Conduct regular reviews of the Transportation Master Plan.	Medium	PED
	70	Create project budgets based on designs as opposed to designs based on available budget to provide higher quality infrastructure.	Ongoing	PED/PW
	71	Apply asset management best practices which include consideration of operating and maintenance costs (lifecycle) in the prioritization of infrastructure investments.	Ongoing	Corporate-wide

IMPLEMENTATION

The delivery approach of recommended studies, initiatives and projects in the TMP review and update is an important consideration. Councillors have the challenge of balancing many competing budget requests annually in striving to reach the City's strategic vision. It is important to provide Council and City staff with a framework to assist in decision-making relating to the transportation system.

Establishing Priorities

Before a project or program is implemented, the process of prioritization must take place. The TMP review and update is the first step in setting direction regarding future capital budget submissions (which could also affect operating budget submissions) and scoping of individual projects.

Partnerships

Implementation requires partnerships as an integral part of delivering transportation services. Opportunities to work with partners can be a valuable part of the transportation service delivery model. Implementation can involve a combination of one or more partnerships. Some examples of existing partnerships are listed below:

- Intergovernmental relations
- Non-governmental and community organizations
- Post-secondary institutions
- Private sector organizations

State-of-Readiness

The City should be proactive and prepared in anticipation of changes by being in a “state-of-readiness” for transportation projects and initiatives. This applies to all projects that already have allocated funding or are considered priority projects for which the City could expect partial or complete external funding.

Being prepared and leveraging our readiness to maximize benefits of available and potential funding sources is important. One of the key directions is to prioritize all projects that are candidates for receiving provincial or federal funding. This will help identify gaps and the critical-path to improve the readiness for future funding opportunities, including any required approvals that may be needed, such as allocation of matching funds.

Supporting Studies and Initiatives

A number of future studies and initiatives were identified as part of the TMP review and update to investigate issues in further detail. These are identified in Chapter 7.

A revenue tools study will help to understand the tools that may be more accessible and practical for funding transportation projects in Hamilton. This proposed study is intended to support future inter-governmental relations and discussions regarding financial sustainability.

PART A:
MUNICIPAL CLASS ENVIRONMENTAL
ASSESSMENT REPORT

City in Motion represents the review and update of Hamilton's Transportation Master Plan. It will act as the guiding document for all future transportation studies, projects and decisions.



Chapter 1

Introduction

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Chapter 1

Introduction

1.1 PURPOSE, SCOPE AND OBJECTIVES

City in Motion, the City's Transportation Master Plan (TMP review and update), is a strategic policy document developed to provide the framework which guides future transportation-related studies, projects, initiatives and decisions.

The purpose of reviewing the TMP is to provide an update of policies and associated actions, work plan and investment strategies needed to achieve the revised transportation vision and goals for Hamilton. It connects the transportation vision and transportation planning decisions to the City's Strategic Plan and provides connections to the City's Official Plan, other master plans and all transportation-related studies, projects and initiatives that combine to support the City's future growth to 2031 and beyond.

The scope of the TMP review and update was developed and presented to Council in February 2015. Minor adjustments to the scope were made based on feedback received during the extensive public engagement

process that was part of the TMP development. The scope includes:

- Review and update of the 2007 TMP Problem / Opportunity (Vision) statement
- Review and update of the 2007 TMP policy framework including policy initiatives that have been working, and those that have not been working as well as intended
- Development of new policies and strategies required to meet City transportation objectives
- Review of the regional link-based travel demand model analysis using EMME (forecast tool)
- Undertaking of an extensive public engagement program to address questions about the direction of the transportation system in Hamilton
- Implementation strategies and key actions to achieve the revised TMP Vision
- Consideration of some specific policy issues including street conversions, complete streets, and health and the built environment

**The
planning
horizon
of the
TMP
review
and
update is
2031**

The objectives of the TMP review and update are to:

- Guide the planning, design and implementation of the City's transportation system to make sure that investment decisions are aligned with the transportation vision and goals.
- Consider population and employment growth with current and projected transportation trends for the 2031 planning horizon and beyond.
- Consider the needs of changing population demographics.
- Integrate previously approved and ongoing transportation studies and initiatives.

1.2 USING THE TMP

The TMP review and update can be used by a number of different transportation stakeholders. For example, some stakeholders may use the TMP as a reference document, or guide for developing strategies and making investment decisions. Others may use it as a starting point for developing more detailed plans and analyses for transportation-related studies, projects and initiatives. Some stakeholders may want to use it simply to understand the City's transportation vision, goals, strategy and initiatives. More specific examples illustrating how the TMP may be used include:

- The public may have an interest in following the development of transportation initiatives in the City and in gaining a better understanding of how mobility choices will improve in the future. The TMP empowers the public to actively participate in the change.

- Elected Officials should use the TMP to assist in decision making. They can also use it to educate and engage their constituents about transportation-related changes that will impact their neighbourhoods and the City as whole.
- City staff should use the TMP as a guide to making clear, balanced and fiscally prudent decisions on transportation initiatives, infrastructure investments and program administration. In general TMPs can be used as the basis for implementing the City's Official Plan (an Official Plan amendment will not be required as part of this review and update).
- City engineers, designers and capital delivery programs staff should scope transportation capital programs and plans to implement the TMP.
- City transportation professionals, planners and health practitioners will be able to use transportation system performance targets to achieve modal-split aspirations and improve the reliability of travel by balancing the transportation network for all users, regardless of age, ability or income.
- The TMP can be used to position the City into a "state-of-readiness" for partner-funded transportation initiatives (e.g., Federal, Provincial, Public-Private-Partnerships) as funding becomes available and partners are engaged.
- Prospective investors in the City may use it to make development decisions based on transportation initiatives that result in new available transportation connections.

1.3 ENVIRONMENTAL ASSESSMENT (EA) PROCESS

The TMP review and update was undertaken according to the Municipal Class Environmental Assessment (EA) process (Municipal Engineers Association (MEA), October 2000, as amended in 2007, 2011, and 2015) for Master Plans (Approach 1).

The Master Plan approach recognizes that there are benefits to using the EA process when comprehensive plans are undertaken for projects that have a relatively minor impact according to their environmental significance and the effects on the surrounding environment. The output of this Master Plan includes road projects and transit projects.

The EA process includes the evaluation of possible solutions or design concepts and recommends the best approach based on an evaluation of impacts and mitigation measures for potential risks. A summary of the five phases of the EA process is:

- **Phase 1** – Identify the problem or opportunity.
- **Phase 2** – Identify and evaluate alternative solutions to address the problem and establish the preferred solution.
- **Phase 3** – Examine alternative methods of implementing the preferred solution and establish a preferred design concept. Identify measures to minimize adverse effects and maximize positive effects.
- **Phase 4** – Prepare an Environmental Study Report which summarizes the rationale, planning, design and consultation process for the Project.

- **Phase 5** – Implement the Project. Master Plans address Phases 1 and 2 of the EA process. Approach 1 for Master Plans involves the preparation of a Master Plan document at the conclusion of the first two phases of the Municipal Class EA. This document is made available for public comment prior to being approved by the municipality. Typically, the Master Plan is done at a broad level of assessment thereby requiring more detailed investigations at the project-specific level in order to fulfil the requirements for specific Schedule B and C projects identified within the Master Plan. Certain projects (Schedule A+ and A) can be implemented upon approval of the TMP. All Schedule C projects identified in this TMP have been previously approved as part of sub-area TMP's, through the development planning process or through other reports submitted to Council. Table 1.1 shows examples of the types of road projects in each EA Schedule. Municipal transit projects follow the Transit Project Assessment process (TPAP).

Master Plans should be reviewed every five years to determine the need for a detailed formal review and/or updating. Potential changes, which may trigger the need for a detailed review include:

- Major changes in the original assumptions.
- Major changes to components of the master plan.
- Significant new environmental effects.
- Major changes in proposed timing of projects within the master plan.

TABLE 1.1
Examples
of Road
Projects
Associated
with
Different EA
Schedules

EA Schedule	Types of Road Projects*
Schedule A	Normal and emergency operations and maintenance projects (e.g. re-paving, local road improvements, re-designation of an existing General Purpose Lane)
Schedule A+	Smaller capital projects with minimal environmental impact (e.g., construction of sidewalks or bicycle paths or lanes within the right-of-way)
Schedule B	Improvements and minor expansions to existing roads such as reconstruction or widening that may have some adverse environmental impact requiring environmental screening and notification of those affected (less than \$2.3M)
Schedule C	Construction of new facilities and major expansions requiring the full five-step EA process and public consultations

*Municipal transit projects follow the TPAP process.

In addition to the above, other changes including significant new health effects, funding opportunities, changes or updates to internal guiding documents (e.g., GRIDS, Strategic Plan, Official Plan, other City Master Plans) and changes to external guiding documents (e.g., Places to Grow, the Big Move, Regional Transportation Master Plan (RTP)) should also be a consideration to trigger a review.

Stakeholder engagement is an important component of the EA process and there are requirements for notification and consultation with the public, agencies, and other stakeholders at key phases of the process. This allows any plan or project to consider and incorporate stakeholder issues, ideas and priorities in a meaningful way. This is described in more detail in the following section.

⁴ International Association of Public Participation (IAP2) 'Public Participation Spectrum'

1.4 PUBLIC AND STAKEHOLDER ENGAGEMENT

Public and stakeholder engagement was an important component of the TMP review and update. Extensive public engagement activities were undertaken across Hamilton throughout the study. The activities are summarized below and described in more detail in the Public Consultation Report.

The engagement approach applied went above and beyond the requirements of the EA process and embodied the eight core principles of public engagement identified in the City's Public Engagement Charter. The engagement approach included three levels of participation⁴:

- **Inform** – providing the public with balanced and objective information to assist them in

understanding the problems, alternatives, opportunities and/or solutions (e.g., through a corporate website or information campaign).

- **Consult** – obtaining public feedback on analysis, alternatives and/or decisions (e.g. through surveys, public meetings or focus groups).
- **Involve** – working directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered (e.g., through workshops or deliberative polling).

Throughout the study process, both internal City staff and external stakeholders were engaged.

A number of consultations were held with staff in the various departments responsible for planning, implementing, operating and maintaining the transportation system. These sessions allowed the study team to understand the issues and constraints experienced by those managing or using Hamilton's transportation system and provided the opportunity for all stakeholders to offer feedback and/or comments on proposed improvements and/or recommendations. Please see Public Consultation Report for a complete list of the departments and divisions involved in the TMP review and update.

A number of methods were used to engage the public throughout the study process including newspaper advertisements, Public Information Centres (PICs), online surveys, a webpage, social media, an information booth/kiosk at numerous City-wide festivals and events, and

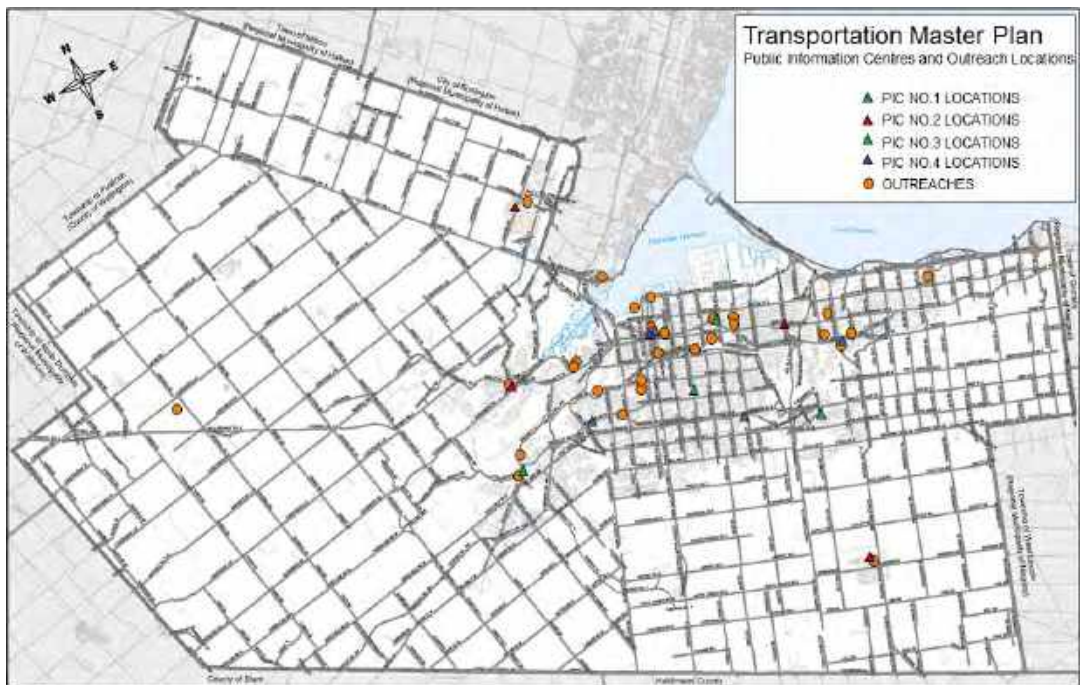
speaking engagements. In total, over 3,500 people were engaged in person and through online surveys. Many more were engaged through the project website, and participation in related studies such as Our Future Hamilton.

PICs were held at four key stages of the review and update:

- **PIC #1 (March 2015)** introduced the TMP review process and obtained input about the TMP Problem/Opportunity (Vision).
- **PIC #2 (June 2015)** presented TMP findings to date, including opportunities and gaps in the transportation network, and obtained input into additional transportation opportunities as well as the vision for Complete-Livable-Better (CLB) Streets.
- **PIC #3 (December 2015)** presented draft system alternatives, preliminary policy directions and recommendations to date, and obtained input on the TMP findings to date. Meeting attendees participated in Town Hall Polling on key questions related to the TMP.
- **PIC #4 (April 2016)** presented the study's preliminary findings and recommendations.

A total of 14 PIC events were held. Venue locations were chosen to ensure that there would be city-wide contribution to the TMP based on the needs of citizens in all 15 Wards as shown in Figure 1.1.

FIGURE 1.1
 TMP Public Information Centre (PIC) and Outreach Locations



At the PICs, members of the public were given the opportunity to:

- Speak to the study team.
- Listen to a presentation.
- Participate in a question and answer period.
- Provide feedback using electronic voting devices (i.e. town hall polling).
- Participate in small group discussion.
- Participate in a hands-on design of a complete street and mapping exercises.

Meeting attendees were also provided with a comment sheet which could be filled in at the meeting or provided to the Study Team at a later date.

Three online surveys were also administered through the City’s TMP project website:

- The **first survey** (September to October, 2015) focused on identifying the public’s key issues

and concerns with the existing transportation system (308 responses).

- The **second survey** (October to November, 2015) obtained feedback on CLB streets and identified the type of treatments that were considered to be “must-haves” and those that were “nice-to-haves” if the right-of-way (ROW) could accommodate it (245 responses).
- The **third survey** (December 2015 to January 2016) concentrated on preferred corridor improvement alternative solutions, preferred policies, emerging technology, and direction of CLB streets. The survey provided the public with the opportunity to choose more than one answer (454 responses).

In addition to these initiatives, a booth/kiosk was set up at 30 City-wide events between 2015 and 2017, which allowed participants to provide feedback on key transportation issues and concerns.

Tables 1.2 and 1.3 provide a summary of stakeholder engagement throughout the study process.

The City of Hamilton’s communications Twitter account (@cityofhamilton) was used to share PIC meeting notices. Table 1.3 summarizes public engagement on Twitter (including all TMP-related tweets up to December 2016). The project webpage (www.hamilton.ca/tmp) also received 10,000+ visits between April 2015 and February 2017.

A summary of the key priorities expressed during the public engagement process is provided in Table 1.4. Details about how public and stakeholder feedback was considered and included in the TMP review and update are provided throughout the remainder of this document, as described in detail in the Public Consultation Report of this report. This stakeholder feedback was incorporated into the restatement of the vision and in each of the key themes upon which the TMP is based.

TABLE 1.2
People Involved through Various Methods of Engagement

Type of Engagement	Events	People Engaged
Attendance at Festivals/Events	30	1,455
Public Information Centres (PICs)	14	326
Stakeholder Meetings	10	145
Surveys	5	1,084
Speaking Engagements	7	585
Total	66	3,595



Community Engagement & Participation

TABLE 1.3 Summary of Public Engagement on Twitter

Type of Engagement	Number
Tweets	37
Impressions	130,414
Retweets	243
Likes	106
URL clicks	588

The Community Engagement & Participation graphic from Hamilton’s 2016 - 2025 Strategic Plan is used throughout this document to highlight comments that were heard through public and stakeholder engagement, and how it was incorporated into the TMP review and update. This is described in more detail, particularly in the context of the Strategic Plan, in Chapter 2.

TABLE 1.4
Some Key
Priorities
Expressed
through
the Public
Engagement
Process



Community
Engagement
&
Participation

Public Information Centres	Surveys	Meetings & Workshops
<ul style="list-style-type: none"> • Focus on public transit, walking and cycling, complete streets and complete communities • Improve connectivity between Upper and Lower Hamilton • Consider alternate and emerging technologies • Require seamless connection between all travel modes • Provide for truck movements in rural areas and connectivity between inter-modal hubs and the highway system • Consider accessibility for all ages and abilities 	<ul style="list-style-type: none"> • Physical condition of roadways needs to be improved • Improve cycling, transit and road infrastructure • There is a reliance on the private car for longer distance travel • Highest priority for investment is CLB streets to foster complete communities • Consider alternate technology for mountain access 	<ul style="list-style-type: none"> • The need for better communication and integration between agencies and stakeholders • Data sharing between stakeholders will enable system reliability • Project opportunities are missed due to varying time frames • Need to integrate Public Health and Public Works initiatives • Public awareness is necessary for goods movement initiatives

1.5 COLLABORATION WITH OTHER STUDIES

There are a number of strategies, initiatives, projects and studies that are closely related to the TMP. The public comments from these other projects and the TMP were shared in order to increase the reach of public input and demonstrate the collaboration between these projects. Figure 1.2 highlights some of the ongoing or recently completed studies/projects that involved collaboration with the TMP review and update.

1.6 BACKGROUND REPORTS

The following background reports were prepared over the course of the TMP process. They do not comprise part of the TMP, but they are available for review as background content.

Public Consultation Report includes details of the extensive public and stakeholder engagement that was undertaken as part of the TMP review and update. This included but was not limited to Public Information Centres (PICs), surveys, speaking engagements, social media, project website, and more. This report also includes a comprehensive acknowledgements section.

FIGURE 1.2 Summary of Collaboration with Other Studies



Complete-Livable-Better Streets Policy and Framework provides Complete-Livable-Better (CLB) streets policies along with a supporting toolkit of roadway, boulevard and intersection streetscape elements to guide street design. The intent is that this document can be used to inform the decision-making process for incorporating CLB streets into all future street projects. This paper provides a “how-to” manual and an implementation strategy

building upon the concept of routine accommodation.

Emerging Technology Policy Background Report provides a high-level review of emerging technology in transportation. It demonstrates the importance of considering and planning for emerging technology in transportation, and also identifies specific policies to be incorporated into the TMP review and update.

Goods Movement Review highlights the current issues, conditions and opportunities to support and inform the TMP review and update and related policies. It also highlights areas for integrating private and public developments for effective and efficient goods movement strategies. A review of Hamilton's current goods movement system is included, as well as the potential for future network solutions incorporating new areas of goods movement, and the integration of goods movement and CLB streets.

The Role of Health in the Built Environment provides a high-level review of the relationship between health and transportation planning.

Road Safety Policy Background Report provides a high-level review of road safety, including what the City is currently doing regarding the Hamilton Strategic Road Safety Program and Vision Zero. This sets the stage for the development of new policies and actions related to road safety.

This study was developed in collaboration but relies on partners in implementation, including Metrolinx and the Ministry of Transportation (MTO)

Street (One-way to Two-Way) Conversions Paper provides a decision-making framework to consider future street conversion requests in Hamilton by establishing an evaluation and priority tool.

Future Travel Demand Modeling Report provides an overview of the regional link-based travel demand model analysis (for the AM peak hour) using EMME that was undertaken as part of the TMP review and

update. This analysis was completed to identify existing and future transportation system deficiencies and assess network needs and opportunities for the TMP. The model was also used to evaluate the impacts associated with potential future network improvements. This report also provides recommendations about future management of the model.

Sustainable Mobility Program Review outlines Hamilton's current and planned Sustainable Mobility Program (Transportation Demand Management implementation). This paper contains measures and policies related to implementing and promoting a sustainable transportation system, through policies and programs.

Cycling Master Plan Review and Update provides an update to the Cycling Master Plan prepared in 2009, *Shifting Gears*. It highlights additional improvements to the cycling network supported by the TMP. The future plan is a multi-modal shift in the way Hamiltonians move through the City. It diversifies neighbourhood networks and provides interconnectedness along major links. This update illustrates the current success and future expansion of the cycling network in new and existing areas of Hamilton.

The 2016-2025 Strategic Plan was a contributing factor that led to the establishment of the TMP review and update desired outcomes: Sustainable and Balanced Transportation System, Healthy and Safe Communities, and Economic Prosperity and Growth.



Chapter 2

Setting the Stage for New Directions

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2.1 Successes and Challenges Since 2007	35
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ART GALLERY

CONVENTION CENTRE

COPPS COLISEUM

FARMERS' MARKET

HAMILTON PLACE

FOOTBALL HALL OF FAME

TOURIST INFORMATION

INTERNATIONAL VILLAGE

THEATRE AQUARIUS

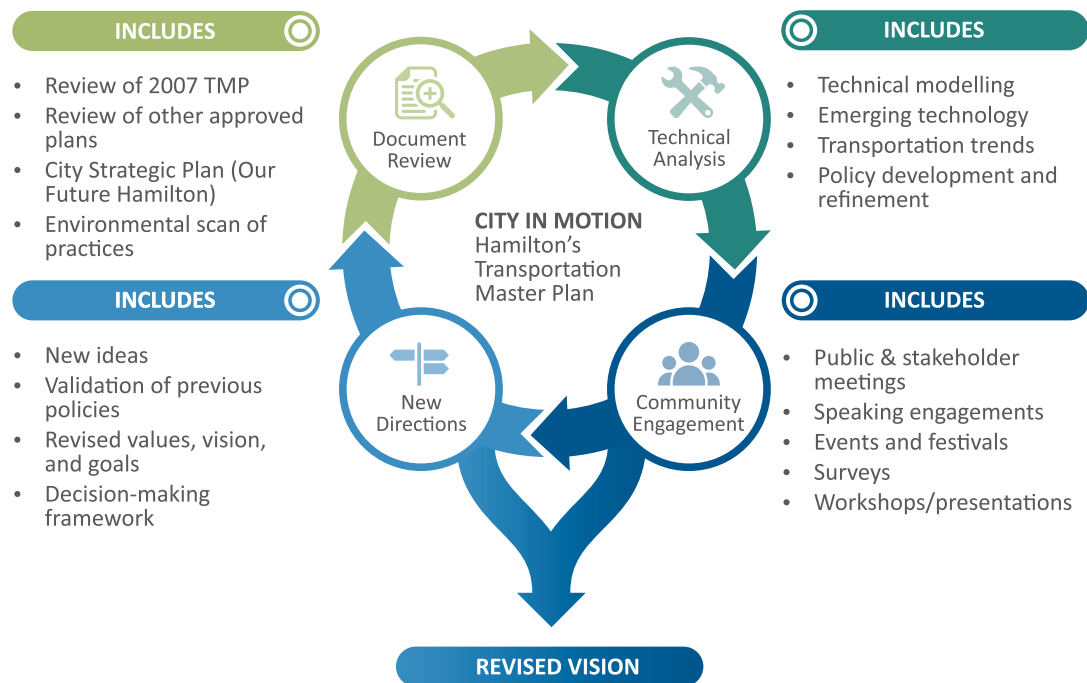
Chapter 2

Setting the Stage for New Directions

This chapter outlines the contributing factors that led to new strategic directions for desired outcomes: Sustainable and Balanced Transportation System; Healthy and Safe Communities; and Economic Prosperity and Growth. This also led to the development of a revised

vision for the TMP review and update. The process of the TMP review and update included document reviews, technical analyses, and extensive community engagement. This is illustrated in Figure 2.1.

FIGURE 2.1
Summary of
TMP Review
and Update
Process



2.1 SUCCESSES AND CHALLENGES SINCE 2007

A number of transportation milestones have been reached in the City since the 2007 TMP was approved, including:

- Smart Commute Program (e.g., 23 employers and 90,000+ commuters)
- Advanced higher-order transit planning resulting in funding for the B-Line LRT project
- Transit investment in new transit terminals and park and ride facilities (e.g. MacNab (2010) and Mohawk College (2016) transit terminals, and Mountain Transit Centre (2015) park and ride facility)
- Integrated planning with Metrolinx to open the West Harbour GO Station (opened in 2015) and anticipated opening of the Confederation GO Station in 2019
- Optimized traffic operations through new Advanced Traffic Management System (ATMS) (2015)
- Approved Pedestrian Mobility Plan (2013)
- Advanced road safety initiatives (Hamilton Strategic Road Safety Program, 2014)
- Approved Cycling Master Plan (2009) (added approximately 85 lane km of bicycle lanes to the existing network between 2010 and 2016)

However, Hamilton like many municipalities in the GTHA and across Ontario, continues to face a number of challenges, including:

- Lack of sustainable funding for transportation infrastructure and competing priorities for available funding
- Changing demographics and an aging population
- Alignment of the transportation system with desired public health outcomes (e.g. reduced chronic disease and injuries/fatalities, improved mental well-being and respiratory function).
- The moving of our economy beyond its traditional industrial base to a more services-based economy
- Slow adoption of and readiness for emerging technologies and the concept of individual user-based mobility and the unknown impacts associated with them
- Insufficient mobility options associated with increased development away from urban areas
- Continued slow pace of change in modal split away from the use of single occupant vehicles (SOV)

Since 2001, efforts to reduce SOV use in favour of transit and active transportation options have had only modest success inasmuch that the proportion of SOV use has been stable or experiencing a modest decrease in Hamilton. The aspirational mode share targets set in the 2007 TMP have not been achieved. The investment that has been provided has been beneficial because it has not worsened, despite urban expansion.

In Hamilton, SOVs were used for 67% of travel in 2011⁵, which is consistent with the trends in neighbouring municipalities. However, when

⁵TTS, Data Management Group, University of Toronto..

compared with other municipalities such as Toronto (62%), Ottawa (58%), and Edmonton (57%), there is much more to be accomplished. Hamilton's aspirational modal split target for SOV travel identified in the 2007 TMP is 52% by 2031. Achieving this target would place Hamilton amongst the leaders in Canada and should continue to be an aspiration for the City. Table 2.1 provides a comparison of observed mode share in other municipalities, as well as aspirational targets (if available).

Automobiles will continue to be the most popular travel mode within the transportation system for many years to come. However, the continued prevalence of SOV travel re-emphasizes the need to provide and promote convenient, affordable, and attractive transit and active transportation alternatives.

WHAT WE HEARD:

When asked about current and preferred travel modes based on travel distance, survey respondents indicated that there is a preference to increase cycling and transit use.



2.2 CATALYSTS FOR CHANGE (PROBLEM STATEMENT)

There are a number of factors influencing the changes identified in this TMP review and update. Societal and transportation needs are shifting and the concept of mobility is on the cusp of major transformation. This change is associated with emerging technologies, the sharing economy, autonomous vehicles and abundant communication tools.

How municipalities respond and adapt to change through reactive and/or proactive policies and supporting actions can have long lasting impacts on the quality of life of their citizens. Some of the key catalysts for change that influence travel patterns and behaviours are identified in this section.

2.2.1 Demographic Catalysts

Hamilton's population is anticipated to grow approximately 22.9% between 2016 and 2031, and employment is anticipated to grow approximately 23.4% between 2011 and 2031 (see Table 2.2).

Changing demographics have been, and will continue to be an important driver of change. If current mode share trends continue, an estimated increase in population of 123,000 by 2031 will result in more trips per day within, into and out of Hamilton. More vehicles trips will be added to the road network, thereby reducing the reliability of travel, increasing the potential for collisions, and potentially reducing the reliability and efficiency of goods movement. There will also be environmental impacts such as increased greenhouse gas (GHG) emissions as well as other social, economic and health-related impacts.

While Hamilton's population is growing, it is also aging. In 2016, 127, 000 (or 27%) of Hamilton residents were at least 60 years old. The number of older adults and seniors in Hamilton is expected to grow by 65% to 187,000 over the next two decades . As a result, mobility needs are changing as this affects the ways people will move through the City and necessitate a change in the design and accessibility of transportation system infrastructure and services such as accessible transit services (ATS).

TABLE 2.1
Mode share
comparisons

	City / Region	Existing Mode Share (based on most recent available data)			Aspirational Mode Share Targets		
		Walk- Cycle	Local Transit	SOV	Walk- Cycle	Local Transit	SOV
GTHA*	Hamilton	5%	7%	67%	15%	12%	52%
	Toronto	6%	13%	62%	n/a	n/a	n/a
	Halton Region	Based on Burlington, Oakville, Milton, and Halton Hills data			n/a	15-20%	n/a
	Halton Hills	6%	0%	73%			
	Burlington	4%	2%	73%			
	Oakville	4%	2%	70%			
	Milton	1%	3%	74%			
	Mississauga	5%	8%	65%	n/a	n/a	n/a
	Brampton	5%	6%	67%	10%	16%	46%
	Niagara Region	3%	2%	73%	n/a	n/a	n/a
Canada**	Ottawa	13%	16%	58%	15%	26%	50%
	Winnipeg	7%	13%	71%	n/a	n/a	n/a
	Quebec City	15%	9%	56%	17%	18%	45%
	Calgary	13%	9%	79%	23%	17%	60%
	Edmonton	12%	9%	57%	n/a	n/a	n/a

* GTHA data based on 2011 TTS data and individual municipal master plans/monitoring reports, if available

** Identified within individual municipal master plans/monitoring reports, if available

TABLE 2.2
Population and
Employment
Trends in
the City of
Hamilton*,
2001 to 2031

	2001	2006	2011	2016	2031 ⁸ (Projected)
Population ⁹	490,260	504,560	519,949	536,917	660,000
Employment	204,912	219,200 ¹⁰	243,075	259,070**	300,000

⁸GRIDS Growth Report, Section 1.4, Table 1 (2006). The City is currently undergoing a land budgeting process to accommodate the Province of Ontario's Places to Grow: Growth Plan for the Greater Golden Horseshoe (2017) (Growth Plan) forecast.

⁹Statistics Canada (2001, 2006, 2016) Census Data

¹⁰Table 3 Hamilton Employment Area Land Budget Update (2009)

* City of Hamilton only (not Hamilton Census Metropolitan Area)

** Statistics Canada 2016 census data for Place of Work

Shifting demographics and related behavioural preferences are also expected to be a driver of change. Millennials, for example, are choosing to drive less or not engage in obtaining driver's licences at all, as illustrated in Figure 2.2.

The distribution of growth is another important consideration. According to the Growth Plan (2017) 60% of future residential growth is targeted to be accommodated within the existing urban boundary (primarily through intensification) (Growth Plan 2017). This phased target includes a minimum of 200 residents and jobs combined per hectare in downtown Hamilton.

Major transit station areas on priority transit corridors or subway lines will be planned for a minimum density target of:

- 200 residents and jobs combined per hectare for those that are served by subways;
- 160 residents and jobs combined per hectare for those that are served by light rail transit or bus rapid transit; or

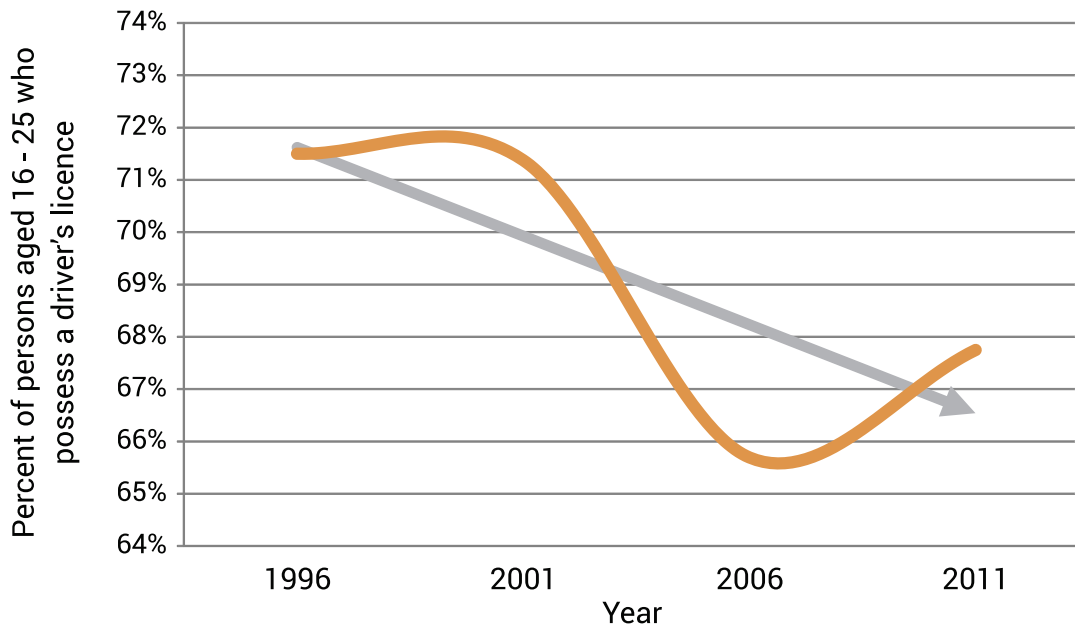
- 150 residents and jobs combined per hectare for those that are served by the GO Transit rail network.

2.2.2 Economic Catalysts

Hamilton is located in the most densely populated corridor of economic activity in Canada. Hamilton's location provides businesses with easy access to a network of highways, international rail lines, local air connections, and the port of Hamilton. It is within half a day's drive of key major urban markets in the United States (U.S.). For these reasons, Hamilton has long been cited as a key gateway for goods movement through southern Ontario.

Hamilton's economy has traditionally been dominated by production and manufacturing and has evolved to become the most diversified economy in Canada. Canada's economic landscape is also changing. According to the Statistics Canada Labour Force Survey, approximately 14% of manufacturing jobs disappeared between 2004 and 2008, while an 11% growth in

FIGURE 2.2
Persons
Aged 16-25
Who Possess
a Driver's
Licenses in
Hamilton
(1996 to
2011)⁶



industry sectors was experienced. Part of this trend is associated with increasing globalization of the labour force and technological advances in the manufacturing sectors. In general, Canada's economic landscape has seen a move to an increase in professional services (e.g. health care, education, technology)⁷. It is important to recognize the changing commuting patterns resulting from the evolution of the City's workforce from traditional industries to increasing employment in service industries located in the developing business parks in the GTHA. Employment area access to mobility options to attract employers and employees is recognized as an important part of the City's 2016-2020 Economic Development Action Plan (EDAP).

Home-based work (commuter) trends identify an increasing proportion of Hamilton's working population

working outside the City's boundaries. The percentage of Hamiltonians working within Hamilton city limits has decreased from 73.6% in 2006 to 71.6% in 2011⁸. The largest destination of these commuters is Halton Region, which accounts for approximately 45% of external commuting trips.

Figure 2.3 shows a summary of travel and commuting characteristics of Hamiltonians.

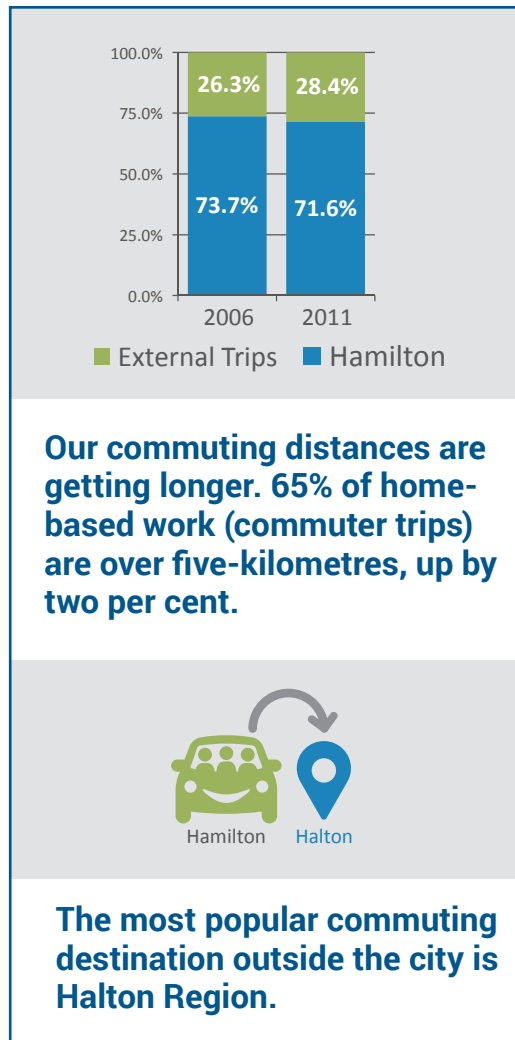
The potential for the City to increasingly become a commuter-based community in the next 5 to 10 years will partially be linked to the success of recent housing market measures and new home buyers priced out of other GTHA markets such as Toronto. As a result, these new Hamiltonians may have to travel further to work and the distance of travel required has a major impact

⁶Transportation Tomorrow Survey, 1996, 2001, 2006, 2011

⁷Statistics Canada

⁸ibid.

FIGURE 2.3
Travel and
Commuting
Characteristics
of
Hamiltonians



on the mode of transportation they typically use.

Providing alternatives for longer distance commuter travel will require providing regional transit options such as GO Transit. The anticipated all-day two-way GO service will become a necessity to keep down the number of automobiles in the already constrained 403 / Queen Elizabeth Way (QEW) corridor. The role of Hamilton’s transportation system will be to attract local jobs to minimize commuting distances and to provide multi-modal options to connect people to these jobs as well as connecting them to the GO Transit network. To this end, the role of the City’s Sustainable Mobility and

Metrolinx Smart Commute programs are vital in helping to facilitate the efficient movement of people.

Emerging economies are another influence on Hamilton’s economy. The advent of the sharing economy, an economic system in which assets or services are shared between private individuals, either for free or for a fee, has changed how we view ownership of assets, including transportation assets. Examples of the sharing economy include car share, bike share and personal transportation providers, all of which currently operate within Hamilton. The sharing economy has been a major influence on changing the traditional transportation paradigm. The concept of mobility-as-a-service (MaaS) has also been gaining popularity and is quickly shifting how we view transportation, including transit. These concepts are defined in more detail in Chapters 4 and 6.

2.2.3 Technology Catalysts

The evolution of technology also continues to be an important driver of change. There has been an explosion of technology development that will continue to transform how people move in the future. MaaS places less emphasis on personal ownership of transportation assets and introduces a seamless multi-modal solution that may include a single system, which monetarizes individual trips regardless of mode to inform trip-making decisions and dissolve transportation silos. Both traditional and emerging economies rely increasingly upon technology, discussed in more detail in the following section.

There are three emerging technology trends that are expected to have

a major impact on the future of transportation in Hamilton:

1. Vehicles and the fuel they use (e.g. autonomous and connected vehicles, electric vehicles)
2. People and the way they share vehicles (e.g. car share, bike share, personal transportation providers and systems)
3. Information and communication (e.g. sensors, the internet of things, data analytics, smart cities (intelligent communities)).

These technological trends need to be taken into account during long-term transportation planning and each can contribute to improving the transportation system. Chapter 4 and the Emerging Technology Paper provides further details about the trend of emerging technologies and how Hamilton needs to be prepared to respond to this change.

2.2.4 Integration of Plans

A summary of various provincial and municipal plans and initiatives that have been undertaken since the development of the last TMP is shown in Table 2.3. This is not a complete list, but is intended to provide some context about the breadth of transportation planning policy influences.

In addition to the plans and initiatives noted above, Provincial and Federal budgets also have an important influence on transportation planning and policy at the municipal level.

Hamilton's transportation system is an important part of the integrated regional transportation network around the Greater Toronto and Hamilton Area (GTHA). The three outcomes of our TMP align well with

the Metrolinx Regional Transportation Plan (a review and update of The Big Move, a 25-year multi-modal regional transportation plan for the GTHA, was recently completed). Table 2.4 shows that the ten strategies and proposed goals of The Big Move align well with the TMP review and update desired outcomes.

2.2.5 Scan of Municipal Practices

The practices and policies employed by Hamilton are consistent with the leading municipalities across the GTHA, Ontario, and Canada. Their practices, policies and mode share performance establish the benchmark in Canada. They each cover the areas of focus in Hamilton's TMP review and update, including:

- Complete streets
- Emerging technology
- Health
- Safety
- Direct link to the relevant strategic plan
- Unique and thorough engagement of public stakeholders

A scan of practices and policies included in the transportation master plans of UTI survey Group B municipalities and neighbouring municipalities was conducted. This is summarized in Table 2.5. Each municipality uses unique descriptors in their transportation plans. However, the overall messages and themes being described demonstrate a consistency of plans between peer municipalities.

TABLE 2.3 Summary of Plans and Initiatives Influencing the TMP Review and Update

Provincial Plans and Initiatives		
Plan Name	Influence	Responsible
CycleON Cycling Strategy	Provides a call to action and route map to support and encourage the growth in cycling over the next 20 years	Ministry of Transportation (MTO)
GGH Transportation Plan	Provides a long-term, comprehensive and multimodal transportation plan for the GGH Regional highway systems planning	MTO (in progress)
Growth Plan	Guides growth and development and informs the development of regional growth plans that guide investments and policies	Ministry of Municipal Affairs
Niagara-Greater Toronto Area Corridor Study	Specific regional highway corridor plan that includes highways within Hamilton	MTO
Regional Transportation Plan	Policy document for GTHA supporting the Growth Plan	Metrolinx
Southern Highways Program	An annually published five-year investment plan in highway construction for Southern Ontario.	MTO
Municipal Plans and Initiatives		
Plan Name	Influence	Responsible
Age-Friendly Plan	Helps to identify and address the needs and priorities of the growing number of older adults and seniors	Planning and Economic Development (PED), Public Works (PW), City Manager's Office (CMO), Healthy and Safe Communities (HSC)
Asset Management Plan	Sets out a strategic framework for managing the City's assets, aligning core infrastructure with service objectives, documenting core practices and activities, and guiding action and investment	PW

TABLE 2.3
Summary of
Plans and
Initiatives
Influencing the
TMP Review
and Update
(continued)

Municipal Plans and Initiatives (continued)		
Plan Name	Influence	Responsible
Community Climate Change Action Plan	Helps to address climate change and resilience to the impacts that are expected in and around Hamilton over the coming decade	HSC
Corporate Energy Policy	Facilitates the achievement of City-wide energy reduction targets, provides for ongoing energy monitoring and targeting of utility usage, and define policies regarding capital investment related to energy	PW
Cycling Master Plan	Provides cycling-specific policy direction and network planning	PW/PED
Economic Development Action Plan	Sets “overarching” goals, identifies areas of focus and key industry sectors to concentrate resources on to maximize economic benefits for the city, and identifies priority actions	PED
Goods Movement Study	Examines the City’s technical potential to become an efficient, integrated and sustainable regional intermodal transportation centre	PED/PW
GRIDS	Identifies a broad land use structure, associated infrastructure, economic development strategy and financial implications for the growth options to serve Hamilton for the next 30 years	PED/PW
Hamilton Strategic Road Safety Program	Provides programming, analysis and policy direction to improve the quality of life of the citizens of Hamilton through a reduction in property damage and injury and death resulting from traffic collisions	PW, HSC, Hamilton Police Service, MTO
Official Plans (Urban and Rural)	Guides and shapes development by identifying where and under what circumstances specific types of land uses can be located	PED

TABLE 2.3
Summary of
Plans and
Initiatives
Influencing
the TMP
Review and
Update
(continued)

Municipal Plans and Initiatives (continued)		
Plan Name	Influence	Responsible
Pedestrian Mobility Plan	Provides pedestrian-specific policy direction and identifies incremental implementation through routine accommodation and is consistent with and complementary to Complete Street principles	PW/PED
Rapid Ready	Provides direction on integration of mobility to support the rapid transit network including the BLAST network, supporting the Ten Year Local Transit Strategy, Sustainable Mobility Program, and marketing	PW
Recreational Trails Master Plan	Provides policy direction and network planning on multi-use trails for pedestrians, cyclists and trail users	PW
Strategic Plan	Provides overarching community vision and guidance to City activities	CMO
Sub-area Plans and Studies	These are community plans, often integrated with land use secondary plans, which identify localized transportation improvements to support economic and community development	PED/PW
Ten Year Local Transit Strategy	Provides short term actions to continue developing Hamilton's transit network	PW
Truck Route Master Plan	Provides truck route-specific policies, network planning and an implementation strategy	PW

TABLE 2.4
 Relationships between the proposed Big Move Goals and Strategies and TMP Review and Update Desired Outcomes

TMP Review and Update Desired Outcomes	Applicable 2041 Regional Transportation Plan Goals	Applicable 2041 Regional Transportation Plan Strategies
Sustainable and Balanced System (Chapter 4)	<ul style="list-style-type: none"> • Sustainable and Healthy Communities • Strong Connections 	<ul style="list-style-type: none"> • Complete Delivery of Current Projects • Connect the Region • Optimize the System • Prepare for an Uncertain Future
Healthy and Safe Communities (Chapter 5)	<ul style="list-style-type: none"> • Sustainable and Healthy Communities • Strong Connections • Complete Travel Experiences 	<ul style="list-style-type: none"> • Optimize the System • Integrate Transportation and Land Use
Economic Prosperity and Growth (Chapter 6)	<ul style="list-style-type: none"> • Sustainable and Healthy Communities 	<ul style="list-style-type: none"> • Optimize the System • Integrate Transportation and Land Use

2.2.6 Future Uncertainty

There is always uncertainty regarding future conditions. Unexpected changes to Hamilton's current housing market and economy, divestment in transportation technologies, or changes to provincial and regional growth targets and policies could all impact transportation in unpredictable ways. Any major unexpected future condition may trigger the need to review and perhaps update the assumptions of the TMP.

- supportive node and corridor development
- Objective 5: Protect the environment by minimizing impacts on air, water, land and natural resources
- Objective 6: Support local businesses and the community's economic development
- Objective 7: Operate efficiently and be affordable to the City and its citizens

2.3 STRATEGIC PLAN DIRECTION

Vision 2020, Hamilton's first community vision, was developed in 1992. This vision was the basis for Hamilton's 2006 growth strategy (GRIDS) and led to the development of a "Statement of Transportation Objectives and Guiding Principles" to ensure consistency between transportation policies and the direction that Hamilton was taking towards growth.

Statement of Transportation Objectives from the 2007 TMP

- Objective 1: Offer safe and convenient access for individuals to meet their daily needs
- Objective 2: Offer a choice of integrated travel modes, emphasizing active transportation, public transit and carpooling
- Objective 3: Enhance the liveability of neighbourhoods and rural areas
- Objective 4: Encourage a more compact urban form, land use intensification and transit-

TABLE 2.5
Summary of
Approach
and
Practices
in TMPs
and/or
Policy
Documents

TMP / Strategic Approach							
City/ Region	Complete Streets	Emerging Technology	Health	Road Safety	Link to Strategic Plan	Unique Public Engagement	Level of Service (LOS)* Approach
Hamilton	Yes	Yes	Yes	Yes	Yes	Yes	Multi-modal approach (proposed)
Toronto	Yes	Yes	Yes	Yes	No	No	Multi-modal: Further detail analysis if at LOS 'E' or greater
Halton Region	Yes	No	Yes	No	Yes	No	LOS 'E' or better at screenlines
Burlington	Yes	No	Yes	Yes	Yes	Yes	LOS 'D' or better
Oakville	Yes	Yes	Yes	Yes	Yes	No	LOS 'D' or better
Peel Region	Yes	Yes	Yes	Yes	Yes	No	LOS 'E' or better
Mississauga	Yes	Yes	Yes	Yes	Yes	Yes	LOS 'E' or better
Brampton	Yes	No	No	Yes	No	Yes	LOS 'D' or better
Niagara Region	Yes	Yes	Yes	No	Yes	No	LOS 'D' or better
Ottawa	Yes	Yes	Yes	Yes	Yes	No	Multi-modal: Varies by location/mode
Winnipeg	Yes	Yes	No	No	No	No	LOS 'D' or better
Quebec City	Yes	Yes	No	Yes	No	No	n/a
Calgary	Yes	Yes	Yes	Yes	Yes	Yes	Multi-modal/ Quality of Service: varies by mode
Edmonton	Yes	No	Yes	Yes	Yes	No	For greenfield sites: LOS 'D' (10–15 year) and LOS 'E' in 30+ year horizon

* LOS refers to vehicular traffic unless otherwise noted.

Vision 2020 was updated as part of the Our Future Hamilton initiative, which provided the foundation for Hamilton's 10-year (2016-2025) Strategic Plan and to guide future decisions. The plan identifies seven priorities:



Community Engagement & Participation: Hamilton has an open, transparent and accessible approach to City government that engages with and empowers all citizens to be involved in their community.



Economic Prosperity and Growth: Hamilton has a prosperous and diverse local economy where people have opportunities to grow and develop.



Healthy and Safe Communities: Hamilton is a safe and supportive city where people are active, healthy, and have a high quality of life.



Clean and Green: Hamilton is environmentally sustainable with a healthy balance of natural and urban spaces.



Built Environment and Infrastructure: Hamilton is supported by state of the art infrastructure, transportation options, buildings and public spaces that create a dynamic City.



Culture and Diversity: Hamilton is a thriving, vibrant place for arts, culture, and heritage where diversity and inclusivity are embraced and celebrated.



Our People & Performance: Hamiltonians have a high level of trust and confidence in their City government.

The icons above will be used throughout the TMP review and update document to indicate concepts in the TMP that relate to specific Strategic Plan priorities. Furthermore, the Community Engagement & Participation graphic is used to highlight comments that were heard through public and stakeholder engagement, and how they were incorporated into the TMP review and update.

The four priorities that most directly impact the transportation system are Economic Prosperity and Growth, Healthy and Safe Communities, Clean and Green, and Built Environment and Infrastructure. In addition to those identified above, Community Participation and Engagement was applied in the development of the TMP review and update and will be an important element as part of future implementation and communication.

2.4 REVISED TMP VISION

There is an increased expectation for transparency, accountability, communication, and public participation and engagement in government decision-making. An important first step in the TMP review and update was to engage the public

on whether the vision, transportation priorities and TMP goals identified in the 2007 plan were still valid.

The public was given the opportunity to provide feedback during the first PIC. The spirit of the 2007 plan remained valid. However, comments were received that reflected the changing values of the community (consistent with the Our Future Hamilton process), as well as comments on how to improve upon the 2007 plan. The outcome of this exercise was a revised vision that was presented at the second PIC and various pop-up engagement events. No negative comments were received regarding the revised vision statement, which is presented in Table 2.6.

WHAT WE HEARD:



The TMP Vision should: incorporate accessibility, be all encompassing, include a holistic approach, balance all modes of transportation, be comprehensive and attainable, provide specific, measurable, achievable, relevant and programmed results.

TABLE 2.6
Comparison of 2007 TMP and TMP Review and Update Vision (Opportunity Statement)

2007 TMP	
Vision (Opportunity Statement)	Key objectives of the Transportation Master Plan include reducing dependence on single-occupant vehicles and promoting improved options for walking, cycling and transit, while maintaining and improving the efficiency of trips related to the movement of goods and servicing of employment areas.
TMP Review and Update	
Revised Vision (Opportunity Statement)	The key objective of the Transportation Master Plan is to provide a comprehensive and attainable transportation blueprint for Hamilton as a whole that balances all modes of transportation to become a healthier city. The success of the plan will be based on specific, measurable, achievable, relevant and programmed results.

WHAT WE HEARD:



Key considerations for the TMP review and update: Road classification, pedestrian/bicycle opportunities, road system opportunities, complete streets, transit service opportunities and goods movement opportunities.

Four measurable goals were identified based on public feedback and the revised vision:

- Reduce dependence on SOVs
- Promote accessibility
- Improve options for walking, cycling and transit
- Maintain and improve the efficiency of goods movement

The measurement of these goals, as well as the TMP vision and policies, is described in more detail in Chapter 8, Monitoring.

2.5 DESIRED OUTCOMES

Four measurable goals were identified based on public feedback and the revised vision:

- Reduce dependence on SOVs
- Promote accessibility
- Improve options for walking, cycling and transit
- Maintain and improve the efficiency of goods movement

The measurement of these goals, as well as the TMP vision and policies, is described in more detail in Chapter 8, Monitoring.

Based on these goals, three desired outcomes for the transportation system were identified through the TMP review and update process and relate to four of the seven City Strategic Plan Priorities, as identified in Table 2.7.

Below is a summary of the desired outcomes, which form the foundation of the TMP review and update and provides the framework of the strategic transportation systems review and detailed policy review. Chapters 3, 4, and 5 describe the three desired outcomes in more detail.

1. Sustainable and Balanced Transportation System: enables the achievement of Hamilton’s economic, social and environmental goals. It is also a system that is planned and financed through its full asset life-cycle. A balanced system is characterized by elements such as connectivity, accessibility, choice and equitable accommodation for all modes of transportation and for users regardless of age, ability or income. This desired outcome is most closely associated with the following Strategic Plan Priorities:

- Clean and Green
- Built Environment and Infrastructure
- Healthy and Safe Communities

2. Healthy and Safe Communities: are enabled by a transportation system that encourages active lifestyles, provides safe movement of people, and reduces dependence on SOVs. The system helps Hamilton to be a safe and supported city where people are active, healthy and have a high quality of life.

TABLE 2.7
Relationship between the 2016–2025 Strategic Plan Priorities and the TMP Review and Update Desired Outcomes

Related 2016-2025 Strategic Plan Priorities	Corresponding TMP Review and Update Desired Outcomes
Built Environment and Infrastructure and Healthy and Safe Communities	Balanced and Sustainable System (Chapter 4)
Healthy and Safe Communities and Clean and Green	Healthy and Safe Communities (Chapter 5)
Economic Prosperity and Growth	Economic Prosperity and Growth (Chapter 6)

This desired outcome aligns directly with the following Strategic Plan Priorities:

- Healthy and Safe Communities
- Clean and Green

3. Economic Prosperity and Growth: are enabled by a transportation system that provides efficient access for industries and businesses to markets, employees, suppliers and customers. The system helps people successfully provide for themselves and their families, provides access to quality and well-paying job opportunities and results in a prosperous and diverse local and regional economy that benefits all residents. In addition, providing high quality multi-modal choices enables households to reduce overall transportation costs. This desired outcome aligns directly with the following Strategic Plan Priority:

- Economic Prosperity and Growth

Policy papers were prepared for each of the subject areas based on the 2007 TMP objectives and principles.

Recommendations from these policy papers were incorporated into the 2007 TMP.

Policies and recommended actions from the 2007 TMP were reviewed and updated as part of the TMP review and update. The review included consideration of current issues and constraints mentioned during public consultation events, the technical analysis related to issues and opportunities, transportation system planning, CLB streets, and Provincial and Regional Transportation Studies that influence and impact Hamilton. The three key outcomes identified above were also considered as part of this review process.

The policy review identified initiatives that had been undertaken since the 2007 TMP, reviewed best practices, highlighted fundamental changes to those policies prepared in 2007, introduced new policies resulting from changes in transportation trends and current transportation initiatives from a municipal, provincial or federal

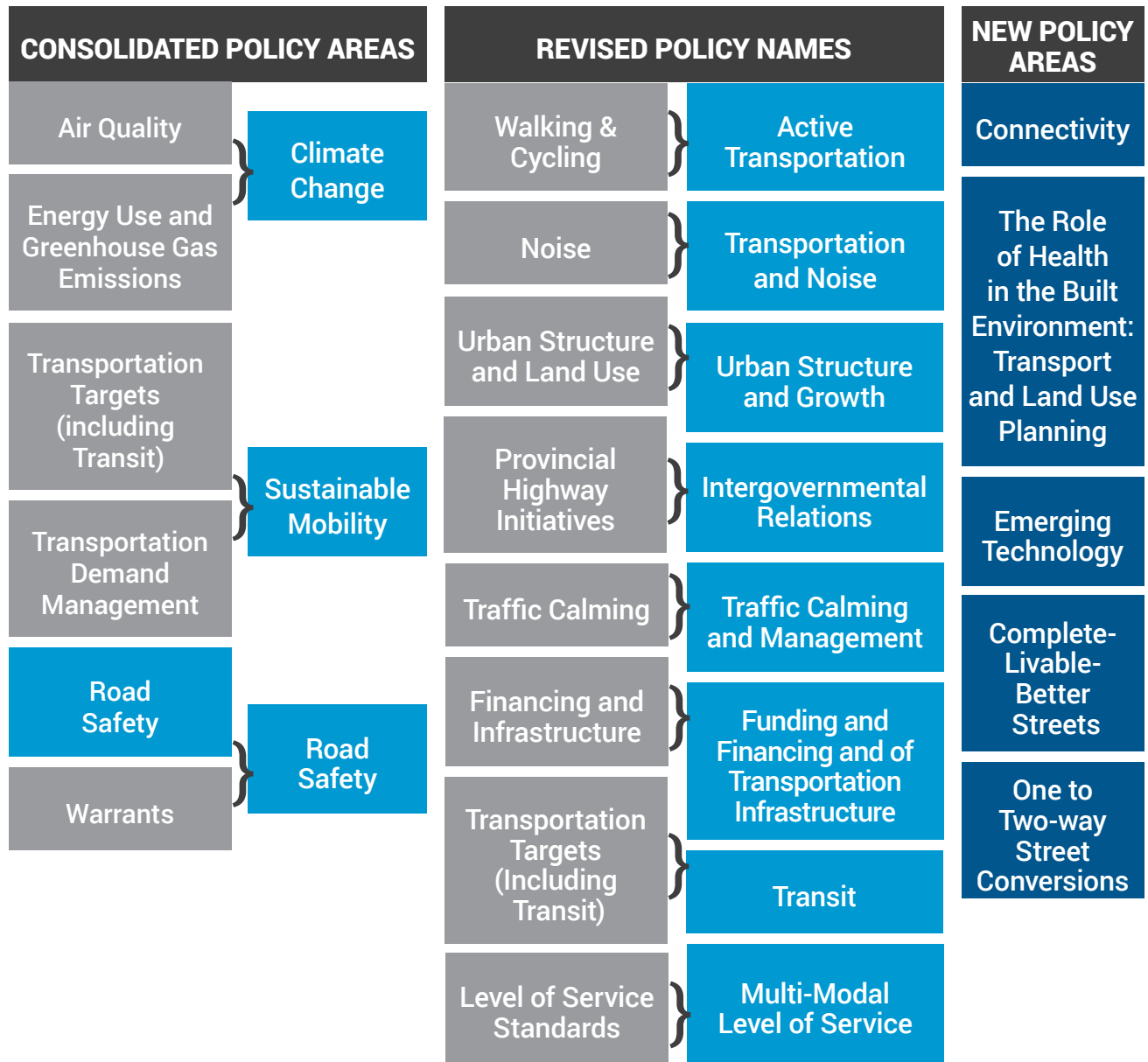
level and identified an updated action plan to implement the revised and new policies.

The results of the policy review and update are summarized in Figure 2.4. In general, six subject areas were condensed into four through the process of consolidation, seven were renamed, and six new subject areas were added, resulting in a total of 25 subject areas. The policy

subject areas in this TMP provide the principles to review the next iteration of GRIDS, looking at a planning horizon of 2041.

The relationship between the three desired outcomes of Hamilton's transportation system and the 25 policy papers is shown in Figure 2.5.

FIGURE 2.5 Revised Policy Framework



POLICY AREAS (MAINTAINED)				
Access Management	Land Use and Travel Patterns	Goods Movement	Road Classification	Urban Design
Accessibility	Economic Development	Parking	Rural Road Standards	

FIGURE 2.5 Desired Outcomes of Hamilton’s Transportation System



ECONOMIC PROSPERITY AND GROWTH

Policy Themes:

- Economic Development
- Goods Movement
- Land Use and Travel Patterns
- Parking

HEALTHY AND SAFE COMMUNITIES

Policy Themes:

- Accessibility
- The Role of Health in the Built Environment: Transportation and Land use Planning
- Road Safety
- Traffic Calming and Management
- Transportation and Noise

SUSTAINABLE AND BALANCED TRANSPORTATION SYSTEM

Policy Themes:

- Access Management
- Funding and Financing of Transportation Infrastructure
- Active Transportation
- Climate Change
- Complete-Liveable-Better Streets
- Connectivity
- Emerging Technology
- Intergovernmental Relations
- Multi-Modal Level of Service
- Road Classification
- Rural Road Standards
- One to Two-way Street Conversions
- Sustainable Mobility
- Transit
- Urban Design
- Urban Structure and Growth

Chapter 3

Strategic Transportation System Evaluation of Alternatives

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Chapter 3

Strategic Transportation System Evaluation of Alternatives

This chapter describes the identification and evaluation of strategic transportation system alternatives.

3.1 TRAVEL DEMAND FORECASTING (EMME MODEL)

Travel demand forecasting was undertaken for the TMP review and update to evaluate the existing conditions and forecast future (2031) transportation system performance including identification of deficiencies and assessment of network needs and opportunities.

The City's travel demand model is a link-based macro-level (regional-scaled) transportation simulation model using the EMME software package. The model is an AM peak model only.

The model was developed as a traditional four-stage approach, which includes:

1. Generating trips that use a transportation system
2. Distributing those trips to and from origin-destination traffic zones across the network

3. Dividing the trips by mode of travel (e.g. driver, passenger, transit)
4. Assigning the trips to a broad transportation system

Travel demand models are calibrated against observed traffic data crossing a series of imaginary "screenlines" in order to ensure the model adequately captures and simulates existing travel. This ensures that the model can be used to forecast future conditions based on growth projections across the Greater Golden Horseshoe (GGH). Thus, macro-level models are generally applied to inform policy direction and decision-making. They are not intended to be used to make specific infrastructure investments solely based on its outputs. They are also not used to assess localized traffic operation issues such as intersection performance, traffic queues, and turning movements. Further details about the modeling are provided in the EMME Technical Report.

The updated model reflects the 2011 Transportation Tomorrow Survey (TTS) data, and includes an updated road and transit network, revised GRIDS land use data, a disaggregated trip generation process, new base trip tables for trip distribution through the Fratar process and a validated transit mode split procedure.

Validation is the process of comparing modelled traffic volumes with observed traffic volumes to assess how well the demand forecasting model fits. Validation was completed for year 2011 for the screenline locations through linear goodness of fit model validation and through the non-linear single acceptance threshold GEH Statistic, which is a commonly used transportation forecasting technique to compare two sets of traffic volumes.

There was also a further validation procedure undertaken as part of collaboration with the B-Line LRT project and the modelling undertaken as part of that assignment. This

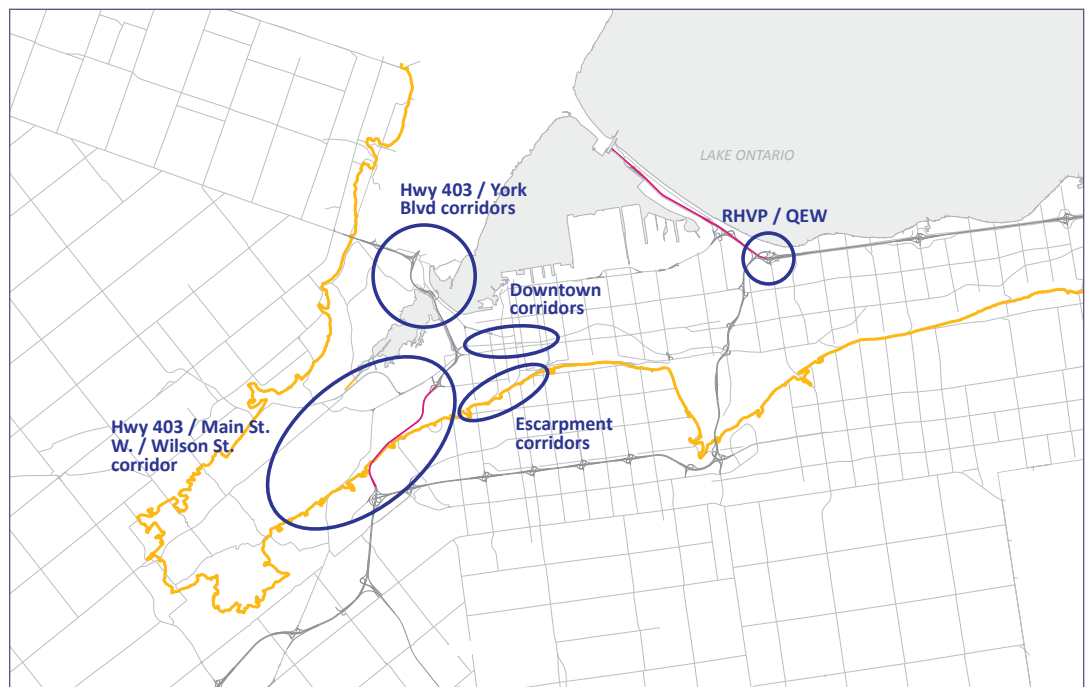
provided both projects the opportunity to validate each other's work. The information from the TMP modeling exercise was then utilized and updated in collaboration with the B-Line LRT project.

Based on these calibration and validation processes, the model was verified to be within acceptable thresholds. As identified in Chapters 7 (Recommendations) and 8 (Monitoring), when new information becomes available through TTS and Statistics Canada, and as changes to population and employment projections, the road network, or other changes occur, the proactive management and monitoring of the model should be undertaken.

3.2 EVALUATION OF EXISTING CONDITIONS

Once the calibration and validation of the model was completed, the model was run to evaluate existing conditions. Evaluation of existing conditions is necessary in order to

FIGURE 3.1
2011 Existing
Conditions
AM Peak
Hour Model
Results



provide a baseline to compare future performance against.

Figure 3.1 shows the existing conditions 2011 AM Peak Hour model results, which identifies five areas that present challenges to providing an efficient transportation system:

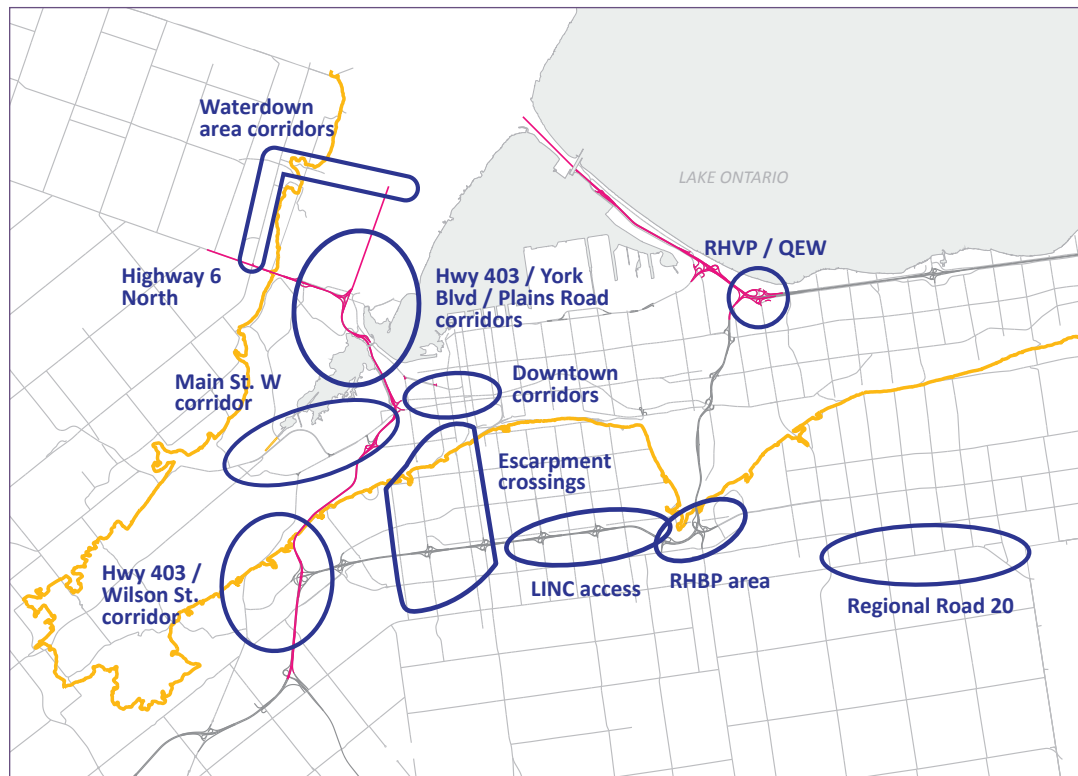
- Red Hill Valley Parkway (RHVP) / QEW
- Highway 403/York Boulevard corridors
- Highway 403/Main Street West/Wilson Street Corridors
- Downtown corridors
- Escarpment crossings

projected travel patterns in 2031 if no planned or further system infrastructure improvements are made must be understood. Accordingly, two “Do Nothing” scenarios were run. As Figure 3.2 demonstrates, under these scenarios, the areas of concern identified under the existing conditions remained or expanded to affect other areas of the system. Further, additional areas of concern developed in locations primarily driven by expanded residential growth areas without additional supporting road networks or transit service. The development of alternative scenarios to address these areas of concern is discussed in the next section.

3.2.1 Assessment of Future “Do Nothing” Conditions

In order to identify potential alternative scenarios for consideration, an understanding of the impacts associated with the

FIGURE 3.2
2031 “Do Nothing”
AM Peak
Hour Model
Results



3.3 IDENTIFICATION OF STRATEGIC TRANSPORTATION SYSTEM ALTERNATIVES

In order to minimize the identified potential system challenges associated with the “Do Nothing” scenario, several strategic transportation system alternatives were identified and analyzed as part of the TMP review and update. These are described within this section.

A “2031 Base Case” scenario established the framework from which future alternatives would be modelled and future recommendations built. The “2031 Base Case” included two models which consisted of a “2031 Base Case” scenario without any planned improvements or programs previously identified and a “2031 Base Case” scenario including current planned and approved upgrades. These improvements are derived from sub-area plans, Council approved initiatives, as well as the capital budget and the City’s Development Charges (DC) By-law (2014). No additional improvements above and beyond what has already been approved are included in this scenario. Each base case was analyzed to recognize the demand which would occur on Hamilton’s network by 2031, providing direction on planned improvements based on areas of concern.

A 12% transit mode share assumption was carried forward, consistent with the 2007 TMP, which is associated with development of the rapid transit network (BLAST) and GO Transit rail expansion to the West Harbour and Confederation Stations (all day service). No enhancement to GO bus service was assumed. Truck mode share is based on MTO roadside

commercial trucking survey data, while other travel modes are assumed to remain the same.

This information was used alongside the outputs of the EMME model to identify alternative solutions that could be evaluated against a number of criteria for future study and consideration. The Base Case validates the need for the previously approved improvements (as identified in Maps 3A and 3B and Appendix A). Notwithstanding these improvements, the analysis of the outputs from the EMME model illustrated in Figure 3.3 indicates there will still be capacity deficiencies and pinch points along strategic road links. Alternative solutions to address these deficiencies were therefore identified.

The consideration of different alternatives is an essential part of the EA process. Five alternatives were examined to determine how well they would meet the City’s transportation system to 2031. These include:

Alternative A: Widen Highway 403 /QEW

- Widening of Highway 403/QEW from King Street to the Highway 6 South Interchange to remove a bottleneck in the existing system.

Alternative B: Localized Improvements (identified through the TMP review and update Process)

- Double transit ridership between upper and lower Hamilton especially on Beckett and James Mountain Road
- Decrease auto trips originating and destined within the Downtown by 5% by changing mode to increased walking and cycling

FIGURE 3.3
2031 AM Peak
Hour Model
Results with
Planned Road
and Transit
Improvements



- Build new roadway from RHVP to airport
- Make interim improvements (optimization) to RR 20 east of Centennial Parkway

Alternative B also relies heavily on the implementation of BLAST, the 10 Year Transit Strategy, and the Cycling Master Plan to achieve transit ridership increases and mode shifts.

Alternative C: Includes Alternative B and widening of LINC and RHVP to six lanes

- Address two bottlenecks identified in the future planning horizon by providing additional capacity on the LINC and RHVP
- Localized improvements identified in Alternative B above

Alternative D: Includes Alternatives A, B and C

- Address two bottlenecks identified in the future planning horizon by providing additional capacity on the LINC and RHVP
- Requires MTO investment to widen Highway 403/QEW to effectively use the increased capacity on the LINC and RHVP
- Localized improvements identified in Alternative B above

3.4 EVALUATION OF STRATEGIC TRANSPORTATION SYSTEM ALTERNATIVES

The following sections summarize the evaluation of strategic transportation system alternatives identified in the previous section. This includes a technical analysis using the City’s travel demand model, as well as overall assessment following the EA process.

The Municipal Class EA document provides guidance on how to evaluate alternative solutions. General criteria include considerations regarding Transportation, Land-Use Planning Objectives, Natural Environment / Natural Heritage Features, Social Environment, Cultural Environment Heritage, First Nations/Aboriginal Peoples and Economic Environments. We have refined these criteria for the purpose of the TMP review and update. This refinement incorporated the lens of the EA process and the three desired outcomes of the transportation system: Sustainable and Balanced Transportation System, Healthy and Safe Communities, and Economic Prosperity and Growth.

Each of the strategic transportation system alternatives were evaluated based on five categories:

- Transportation (Sustainable and Balanced System)
- Environment (Sustainable and Balanced System)
- Social (Healthy and Safe Communities)
- Economic (Economic Prosperity and Growth)
- Implementation (Sustainable and Balanced System)

Table 3.1 provides a summary of the evaluation of strategic transportation system alternatives based on the criteria above.

3.5 PREFERRED SOLUTION

As Table 3.1 indicates, the preferred overall strategy is Alternative D. Since no single approach is likely to solve all transportation problems, this will provide a long-term solution that the

City should continue to work towards, which includes:

- Widen Highway 403 / QEW
- Localized improvements
- Expansion of the LINC and RHVP to six lanes

The immediate priority is localized improvements, with potential need for the others to be in the later years of the planning horizon of the TMP.

WHAT WE HEARD:





The public preferred the implementation of all improvements as the preferred solution, with a focus on localized improvements.

However, this long-term solution is not without challenges. For example, improvements to the transportation system such as the expansion of the LINC and RHVP would not be a prudent measure given the pinch points associated with the Provincial freeway network (QEW and Highway 403). Any capacity gained through the LINC and RHVP expansion until these pinch points are resolved would be negated. Further investigation into the sustainability of future expansion should be undertaken. This is described in more detail in Chapter 7 (Recommendations).

Other long-term and interim solutions to the transportation system that are within the City's control regarding localized improvements should be explored. As such, additional sensitivity testing was undertaken regarding localized network improvements and is discussed in the next section.



TABLE 3.1 Environmental Assessment Evaluation of Strategic Transportation System Alternatives

Evaluation Criteria	Alternative A Widen Highway 403/QEW	Alternative B Localized Improvements (identified through the TMP Process)
Transportation (Sustainable & Balanced)	<ul style="list-style-type: none"> Provides more efficient connections with regional networks Does not provide diverse transit options 	<ul style="list-style-type: none"> Incorporates multi-modal network enhancements
Environment (Sustainable & Balanced)	<ul style="list-style-type: none"> Increase in air emissions Requires expansion into surrounding lands 	<ul style="list-style-type: none"> Localized impacts due to road widening conflicts Increase in air emissions
Social (Healthy & Safe Communities)	<ul style="list-style-type: none"> Potential to reduce collisions and infiltration of traffic into community 	<ul style="list-style-type: none"> Current committed projects will not significantly improve the transportation choices
Economic (Economic Prosperity & Growth)	<ul style="list-style-type: none"> Widening will have major impacts on the Hamilton Economy during construction Requires funding from Senior Government 	<ul style="list-style-type: none"> Committed projects are planned within budget Committed works do not account for future investment
Implementation (Sustainable and Balanced)	<ul style="list-style-type: none"> Major impacts to Hamilton network during construction May require new revenue tools 	<ul style="list-style-type: none"> Minimal impacts Projects have been identified in the 2007 TMP May require new revenue tools
Overall assessment		



Least Preferred → Most Preferred

TABLE 3.1 Environmental Assessment Evaluation of Strategic Transportation System Alternatives

Evaluation Criteria	Alternative C Localized Improvements and widening of LINC and RHVP to six lanes	Alternative D Widen Highway 403/QEW, Localized Improvements, Widening of LINC and RHVP
Transportation (Sustainable & Balanced)	<ul style="list-style-type: none"> Promotes the continued use of SOV travel 	<ul style="list-style-type: none"> Provides diverse transportation options Provides long term solution
Environment (Sustainable & Balanced)	<ul style="list-style-type: none"> Requires expansion into surrounding lands Potential to increase SOVs on Hamilton roads Increase in air emissions 	<ul style="list-style-type: none"> Requires expansion into surrounding lands Improves quality of service Potential to increase SOVs on Hamilton roads
Social (Healthy & Safe Communities)	<ul style="list-style-type: none"> Potential to reduce collisions and infiltration of traffic into community. 	<ul style="list-style-type: none"> Potential to reduce collisions and infiltration of traffic into community.
Economic (Economic Prosperity & Growth)	<ul style="list-style-type: none"> Will require improved ramp facilities and connections to adjoining highways 	<ul style="list-style-type: none"> Will require Senior government funding and coordination Will have major impacts on the Hamilton economy during construction
Implementation (Sustainable and Balanced)	<ul style="list-style-type: none"> Connections to/from LINC must be seamless Requires EA and funding for expansions 	<ul style="list-style-type: none"> Requires EA and funding from senior government for widening and improvements May require new revenue tools Will have negative impacts and restrict social activities during construction
Overall assessment		



3.5.1 Sensitivity Testing for Localized Improvements

Additional sensitivity scenarios were developed to examine in more detail potential localized improvements and to be responsive to community comments received as part of the TMP review and update and related comments identified through the B-Line LRT project. These are described in more detail below:

Scenario 1 Escarpment crossings:

Network performance at escarpment crossings is a key issue for residents as these routes provide access across the natural barrier to and from the Downtown core. The escarpment crossing scenarios developed for this assessment were intended to provide insight into the impacts of certain targeted adjustments to the Escarpment crossings, including:

Scenario 1A: Claremont Access as two lanes up, two lanes down: to evaluate the impacts associated with the Claremont Access operating with two lanes up bound and two lanes down bound, thereby providing one southbound travel lane re-purposed to facilitate walking and cycling.

Scenario 1B: Removal of peak-hour lane control system on Sherman Cut: to assess the impacts of converting Sherman Cut from a two lane directionally controlled road to a typical two lane cross section (one lane northbound, one lane southbound). Currently, Sherman Cut operates with directional control during the AM and PM peaks, enabling one-way travel in the peak direction along both lanes.

Scenario 1C: combines Scenarios 1A and 1B.

Scenario 2: Transit needs and opportunities: The purpose of this assessment was to determine the system impacts associated with the potential exclusive use of James Mountain Road by transit, walking and cycling modes. This model assessment was also intended to assess the transportation system performance along transit route corridors, in order to determine which routes would experience reduced reliability in the AM peak hour and locations that would benefit from transit priority measures. This assessment assumes 10-minute headways along the BLAST network.

Scenario 3: Street conversions:

The purpose of this assessment was to identify the system impacts associated with street conversions (one-way to two-way street conversions). This scenario was executed according to three scenario subsets specific to the impacts associated with Main Street, including:

- a. Paradise Road North to the Delta⁹
- b. Queen Street North to the Delta
- c. Wellington Street to the Delta

The evaluation criteria used for the sensitivity testing through the EMME model included:

- Potential for traffic diversion
- Transportation system performance (e.g. corridor operations, ridership impacts)
- Impact on travel speed

- Environmental (air quality) impacts (e.g. estimated CO2 emissions)

Based on the outputs of the travel demand model, the following conclusions have been identified from a transportation systems perspective for the AM Peak hour only:

Scenario 1: Escarpment Crossings

Conclusion: Although the Sherman Access appears to operate well, the system would benefit from maintaining the peak hour control system on the Sherman Cut and modernizing the system. Therefore, some further feasibility regarding the interaction and impact on operations and safety between the Sherman Access and the Sherman Cut may be undertaken. The conversion of a southbound lane on the Claremont Access to facilitate walking and cycling trips is acceptable and would increase the connectivity between the central upper and lower city by providing multi-modal options.

Scenario 2: Transit Needs and Opportunities

Conclusion: There are opportunities for transit priority measures along the BLAST network, primarily at locations intersecting the LINC, Escarpment crossings and through dense urban corridors (i.e. Downtown). In terms of James Mountain Road, there would be no benefit to the system if this Escarpment crossing was used exclusively for transit, walking and cycling. Further investigation for transit priority measures to focus on up- and downstream efficiencies to permit transit access to James

Mountain Road could provide more benefits. This is already underway for the A Line.

Scenario 3: Street Conversions

Conclusion: The configuration of the Highway 403 interchange ramps at King Street and at Main Street and the detailed impact analysis relating to the up- and downstream operations along the mainline and associated costs rely on consultation and coordination with MTO and do not provide any benefit from a system operations perspective. Therefore in the immediate term, the barriers posed by the integration with Highway 403 make two-way conversion west of Wellington (scenarios 3A and 3B) problematic and would require further consultation with MTO. However, scenario 3C does identify potential opportunities to examine in more detail that could have transportation system benefits. Chapter 4 identifies applicable policy and decision-making frameworks that include livability and economic development criteria for future consideration. The Street Conversion (One- to Two-Way) Policy Paper discusses our approach to street conversions in general.

More details on the above evaluation are available in the EMME Technical Report. This analysis is one of many inputs into the decision-making process that identifies the future timing of improvements for implementation.

⁹The Delta is the location described as the intersection of Main Street East and King Street East at the easterly edge of Gage Park within the Delta Neighbourhood.

Part B:

Transportation Master Plan Review and Update

Transportation Vision

To provide a comprehensive and attainable transportation blueprint for Hamilton as a whole that balances all modes of transportation to become a healthier city. The success of the plan will be based on specific, measurable, achievable, relevant and programmed results

Chapter 4

Sustainable and Balanced Transportation System

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SOCIAL BICYCLES

SOCIAL BICYCLES

 Hamilton

Chapter 4

Sustainable and Balanced Transportation System



Clean and Green



Built Environment and Infrastructure

The direction of the transportation system in Hamilton is aligned with the City’s strategic priorities through the three desired outcomes that were identified during the TMP review and update process (see Figure 4.1). These outcomes are strongly interconnected. This chapter focuses on building and maintaining a sustainable and balanced transportation system.

A sustainable and balanced transportation system is associated with elements such as connectivity, accessibility and equitable accommodation for all modes of transportation and for users of all ages, abilities and income.

4.1 PLANNING FOR A SUSTAINABLE AND BALANCED TRANSPORTATION SYSTEM

Table 4.1 summarizes the TMP review and update performance indicators associated with a Sustainable and Balanced Transportation System.

To achieve these long-term targets and goals, the following sub-sections and associated policy themes identify some of the key actions and associated measures of success. A complete list of actions associated with a Sustainable and Balanced Transportation System are identified in Table 4.3.

FIGURE 4.1 Desired Outcomes of Hamilton’s Transportation System



The University of Winnipeg’s Centre for Sustainable Transportation (CST)¹⁰ defines a sustainable transportation system as one that is planned, designed, operated and maintained to:

- Allow individuals and societies to meet their access needs safely and in a manner consistent with human health and ecosystem health, and with equity within and between generations
Be affordable, operate efficiently, offer choice of transport mode, and support a vibrant economy
- Limit emissions and waste within the planet’s ability to absorb them, minimize consumption of non-renewable resources, limit consumption of renewable resources to the sustainable yield level, reuse and recycle its components, and minimize the use of land and the production of noise.

TABLE 4.1 Summary of key performance indicators

Policy Theme Area	Performance Indicator(s)	Future Signs of Success
Sustainable Mobility	SOV mode share (%)	↓
	Smart Commute Program participation	↑
Active Transportation	Walking/Cycling trips per capita	↑
	Hamilton public bike share system usage	↑
	Kilometers of protected cycling infrastructure	↑
Transit	Transit mode share (%) and trips per capita	↑
	Completion of rapid transit network, BLAST (%)	↑
Roads	Implementation of strategic road network (%)	↑
Climate Change	Corporate and total GHG emissions	↓

¹⁰Defining Sustainable Transportation (2005). The Centre for Sustainable Transportation

“How many do you identify with?”



Built Environment and Infrastructure

WHAT WE HEARD:



“Focus on public transit, walking and cycling, complete streets and complete communities.”

- Pricing tools
- Increases household financial ability by reducing costs associated with vehicle ownership

TDM is one implementation tool to facilitate Sustainable Mobility. Small expenditures can lead to important improvements in a citizen’s commute where the return on investment includes:

- Reduce the need for additional roads or expansions
- Reduce wear and tear on roads
- Contribute to sense of place and road safety helping to achieve the goals of Vision Zero
- Improve air quality and reduce climate change impacts
- Encourage physical activity and contribute to positive health outcomes.

Key recommended actions for TDM build on the achievements of the City’s Sustainable Mobility program since its launch in 2009. Actions are focused on expanding programs to more employees, more residents and expanding the geographic influence of programs. A new area of focus will include individualized marketing as part of, but not limited to, major construction and special events.

4.2 NEW DIRECTIONS AND/OR POLICY LINKS

The following sections summarize the key policy subject areas that support a Sustainable and Balanced Transportation System.

4.2.1 TDM and Sustainable Mobility

Transportation Demand Management (TDM) is “The use of policies, programs, services and products to influence whether, why, when, where and how people travel”¹¹. The implementation of TDM measures can result in travel behaviour change, including:

- Shifting travel modes (e.g. walking, cycling, taking transit or carpooling instead of driving alone)
- Driving reductions (e.g. drivers making fewer trips by car and to closer destinations)
- Reducing the numbers of trips people make (e.g. more people choosing to telework, shop online or combining trips)
- Time and route shifting (e.g. more drivers changing the time or route of their driving trip to avoid traffic congestion)

¹¹Transportation Demand Management for Canadian Communities: A Guide to Understanding, Planning and Delivering TDM Programs. Transport Canada. 2011.

FIGURE 4.2: Definition of TDM

Transportation Demand Management				
The reduction of SOV use through policies, programs, strategies and interventions that affect whether, why, when, where and how a person travels				
Whether	Why (Purpose)	When (Time)	Where	How (Mode)
Telework, flexible work hours, online shopping	Work, school, errands, recreation	Weekday, weekend, evening, peak times	Neighbourhood, community, City	Walk, cycle, transit, drive

4.2.2 Active Transportation

Active transportation includes all forms of human-powered transportation. It was identified as an important element in the 2007 TMP and will continue to be to 2031 and beyond.

Several major milestones have been achieved since 2007:

- Adoption and application of the updated Cycling Master Plan (CMP), Shifting Gears (2009)
- Adoption and application of the Pedestrian Mobility Plan (PMP), Step Forward (2013)
- Installation of approximately 85 lane km of bicycle lanes (2010-2016)
- Installation of over 300 bike racks within the right-of-way (2010-2016)
- Recreational Trails Master Plan (RTMP) (2016)
- Implementation of SoBi Hamilton, the City’s public bikeshare system, with 750 bikes and 115 stations (2015)

- Hamilton received recognition as being a Silver-rated Bicycle-Friendly City through Share the Road Cycling Coalition (2012 and 2016)

Planning for pedestrians continues to be guided by the Pedestrian Mobility Plan. The PMP is complementary to the concept of Complete-Livable-Better (CLB) Streets discussed in more detail in Section 3.2. Incremental change through routine accommodation was identified to facilitate the expansion of the sidewalk network and improve the overall quality of the pedestrian experience in the city both along streets and crossing streets.

A review and update of the CMP was undertaken as part of this TMP Review and Update. It primarily incorporates housekeeping changes and includes the following elements:

- Preferred network
- Cycling facility types and selection considerations
- Assessment and monitoring
- Maintenance
- Supporting programs (e.g. bike parking, bike share, education, promotion, etc.)
- Implementation



Healthy and Safe Communities



Built Environment and Infrastructure



Clean and Green

Maps 1a and 1b show the ultimate cycling network as planned in this update.

A preferred cycling network (maximum 2 km spacing in urban areas), for example, was identified through cycling network planning and initially captured in Hamilton's Cycling Master Plan *Shifting Gears* 2009. Any newly developed areas also need to identify a cycling network that links to the existing network, requiring an update to the plan. The TMP review and update is designed to be the blueprint and the context used when those updates are made to ensure they reflect the latest policy guidelines, technologies and incorporates the latest understanding of the full integrated transportation system and local community priorities.

Key recommended active transportation actions that support a sustainable and balanced transportation system are summarized in Table 4.3. Additional details are included in the *Cycling Master Plan Review and Update*.

4.2.3 Transit

In the 2007 TMP, transit was identified as a major cornerstone of the transportation system in order to contribute to the system efficiency by reducing the need for expensive road expansion. It identified the need to develop higher-order (rapid) transit within the city to support the urban growth structure of nodes and corridors as part of GRIDS. The higher-order network identified in the 2007 plan was updated according to the *Rapid Ready Report*, which identified the BLAST network. In addition, Hamilton has made a number of investments and achieved

numerous successes, including but not limited to:

- Identification of proposed high-frequency corridors as part of Hamilton Street Railway (HSR) Operational Review (2010)
- Adoption of Transit-Oriented Development (TOD) Guidelines (2010)
- Development and approval of the *Rapid Ready* report to support the BLAST network (2013)
- Integration of real-time transit data (2014)
- Approval of the *Ten Year Local Transit Strategy* to support the BLAST network (2015)
- Successful implementation of a public bike share (bicycle transit; SoBi Hamilton) system to support first- and last-mile transit trips (2015)
- Implementation of the Mountain Climber Program, currently a pilot, allowing cyclists to access Escarpment crossings using HSR for free (2017)
- Implementation of the Mountain Transit Terminal park and ride facility (2013), and the Eastgate Transit Terminal (renovated in 2008), Downtown (MacNab Street) Terminal (2011) and Mohawk College Terminal (2016)

Hamilton's BLAST network is part of the Greater Toronto and Hamilton Area (GTHA) regional transit system, as identified in *The Big Move* (2008). The City's continued partnership with Metrolinx is helping Hamilton implement rapid transit.

Examples of some of the recent successes and ongoing activities include:

- Planning and funding of the B-Line
- LRT
- West Harbour GO Station
- Planning of Confederation GO Station
- Working toward two-way all-day (TWAD) GO rail service

Metrolinx has made a significant funding commitment to build Hamilton's B-Line LRT corridor. This is the largest capital project in the City's history at an estimated investment of \$1 billion, anticipated to commence construction in 2019 and operating by 2024. This funding includes the capital costs of building the approximately 13 km in length LRT, which will extend from McMaster University through downtown Hamilton to the Eastgate Square (B-Line). This transit investment has the potential to transform the way Hamilton moves in a more sustainable manner, diversify and intensify development in the City, and integrates with an overall efficient multi-modal transportation system, including integration with conventional HSR service.

Despite these investments, transit ridership in Hamilton decreased slightly between 2006 and 2015 in terms of transit trips per capita per year, as shown in Table 4.2. Continuing the commitment to fund transit initiatives, including the BLAST network, is essential in order to continue working towards the aspirational transit ridership targets of the TMP, described in more detail below. Related to transit ridership, a balance must be found

between adding or increasing transit service in areas of new or increasing development and maintaining a sustainable operating cost recovery ratio.

Canadian Urban Transit Association (CUTA) identifies 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 environment.

Similar to other transportation modes, transit faces pressures arising from the accelerating pace of change. Fast-approaching opportunities and challenges will drive major shifts in how transit can meet the needs of residents.

Changing demographics and emerging technologies have been, and will continue to be drivers of change. Millennials are choosing to drive less or not obtaining driver's licences. At the same time, our population is aging. This has an impact on traditional transit service as well as accessible transit services (ATS). Both of these drivers for change present unique challenges and opportunities for which we can find solutions such as rapid transit and micro-transit. Rapid transit could run along higher density corridors to connect nodes (e.g. employment centres) and better connect people to their destinations.

The sharing economy has been a major influence on changing the traditional transportation paradigm. The concept of mobility-as-a-service (MaaS) has been becoming more popular and is quickly shifting how we view transportation, including transit.

TABLE 4.2
Transit
trips per
capita in
Hamilton¹²

2006	2013	2015	% Change 2013–2015
47.99	45.13	44.71	-0.93%

¹²2017 Transit Operating Budget Ten Year
Local Transit Strategy

MaaS places less emphasis on personal ownership of transportation assets and introduces a seamless multi-modal solution that may include a single system, which monetarizes individual trips regardless of mode type to inform trip-making decisions and dissolve transportation silos. Emerging technology is an essential element of the sharing economy and MaaS.

Transit in Hamilton has already been laying the foundation for MaaS. One example of this is fare integration between transit providers (i.e. Presto, TransCab). MaaS has the potential to provide a similar service but would provide mobility packages (including fare integration) for multiple modes of transportation through a single platform.

Concepts such as privately operated on-demand, one-way micro-transit may have a negative effect on public transit ridership, while having a positive effect on overall transit participation and the efficiency of the overall transportation system. There are opportunities for the HSR to explore the provision of a micro-transit service in low density areas that do not meet performance standards for fixed-route service.

Continued investigation on how to integrate other transportation modes into transit is needed. This will also

help to identify potential impacts and benefits to the transportation system in the future and guide decision making.

Key recommended actions that support Hamilton’s transit system and ultimately a sustainable and balanced transportation system are summarized in Table 4.3.

4.2.4 Roads

Future growth and increasing travel demands will place increasing pressures on the existing road system. Strategies and initiatives to enhance Hamilton’s transportation network include rapid transit, application of intelligent transportation systems (ITS) and other emerging technologies, and TDM tools and strategies, all of which help maximize the efficiency of the road network. However, there is also a need to supplement these strategies with other road system improvements, including selective road expansion.

Provincial Network

An efficient Provincial highway network can support Hamilton’s employment growth and connect people and goods to other parts of the provincial highway system. As identified in Chapter 3 of this report, forecasts show that Highway 403 and the QEW under existing conditions and under a “do-nothing” future scenario will operate under congested conditions without any additional widening. As a result, this has a negative impact on the RHVP and LINC, which also increases the potential for infiltration of traffic through Hamilton’s neighbourhoods and escarpment crossings.

Addressing growing congestion on Highway 403 and the QEW is critical from a number of perspectives. In addition to addressing the issue of traffic infiltration, keeping these provincial facilities moving is important for both the local and regional economies.

As part of the the Niagara-to-Greater Toronto Area (NGTA) study completed by MTO, several alternatives to increase system capacity for people and goods were evaluated. These included both transit and highway infrastructure options. Phase 1 of the NGTA study recommended the addition of a lane in each direction along Highway 403 between King Street/ Main Street and Jerseyville Road, as well as an additional lane in each direction along the QEW between the RHVP and Highway 406 in Niagara Region. These recommendations are subject to EAs and approvals prior to implementation. These are also subject to prioritization relative to other needs across the province.

MTO has also initiated EAs and preliminary design studies to improve the Highway 403/ Highway 6 and Highway 403/ QEW interchanges. A design has been completed for the Highway 6/ Highway 5 (Dundas Street) interchange. However, it is not currently planned for construction in the Southern Highways Program 2017-2021. In addition, this TMP recognizes the need to review the current Highway 403 connections through the lower Hamilton.

At the time of this TMP, MTO was leading the Greater Golden Horseshoe (GGH) Transportation Study with a planning horizon of 2051. This on-going multi-modal study has identified concept of

utilizing managed lanes such as high occupancy vehicle or toll (HOV/ HOT) lanes to help manage future transportation demand. This concept could be applied to Highway 403 and the QEW, and also extended to include the LINC, RHVP and other major corridors in the City.

As part of a longer term strategy to ensure a well connected highway network for the movement of goods and multi-modal travel, the City will continue to work with MTO and adjacent municipalities on the planning for the Niagara-to-Greater Toronto Area (NGTA) corridor. While it is expected that this corridor may not be implemented by 2031, it is important to continue planning to ensure that Right-of-Way is protected.

Local Network

Hamilton's local road network includes parkways (RHVP and LINC), arterial, collector, and local roads.

The planned new roads and road network improvements identified in Maps 3a and 3b and listed in Appendix A have been previously identified and approved as part of Secondary Plans and supporting transportation plans and EAs. This future network formed the future base scenario evaluated in Chapter 3.

As identified in previous sections of this chapter, providing modal choice and shifting the mode share is an important part of providing a sustainable and balanced transportation system. In some instances, this may require system optimization through the addition of infrastructure, such as queue jump lanes for transit or centre two-way left turn lanes to facilitate active transportation and balance

road safety and operations. Road urbanization projects also provide opportunities to integrate sidewalks and cycling facilities through routine accommodation.

Additional system optimization approaches such as right and left turn lanes may be required as part of development to enhance safety and operations. Real-time signal timing optimization and integration of transit signal priority and emergency response pre-emptions through the City's Advanced Traffic Management System (ATMS) provide opportunities to achieve system efficiencies.

Capacity improvements to the RHVP/LINC will also be required within the horizon of this TMP. The most critical priorities are to address the connections at the LINC/Highway 403 and at the RHVP/QEW. The RHVP/LINC are also suitable for a managed lane approach which would seek to maximize capacity through the designation of HOV lanes, queue jump lanes for express buses and approaches such as ramp metering prior to full expansion.

Rail crossings are also part of Hamilton's local road network. Although providing grade separation at rail crossings has safety and operational benefits, the cost associated with providing grade separation is substantial. With projected increased rail traffic associated with all-day two-way GO Transit service to Niagara coupled with intensification pressures, a strategic assessment of future grade separation candidate locations and cost-sharing and/or recovery will need to be undertaken.

Key recommended road network actions that support a sustainable and balanced transportation system are summarized in Table 4.3.

4.2.5 Complete-Livable-Better Streets

Complete-Livable-Better (CLB) Streets is an approach to right-of-way design (inclusive of streets) that balances the needs of all uses and users regardless of age, ability or mode of transportation in an equitable manner. A CLB streets approach represents a shift from traditional street design approaches with their primary focus on moving vehicular traffic and is rapidly gaining popularity across North America. Advantages of CLB streets include:

- A more convenient transportation network through a focus on maximizing the movement of people and goods rather than just private vehicles
- Appropriately allocating space for all users of the street
- Improved network resilience including a provision of choice and flexibility associated with multiple ways to get to destinations
- Boulevard space for enhanced public realm features
- Boulevard space for additional street trees, landscaping and environmentally sustainable infrastructure
- Improved public health through the provision of comfortable and safe opportunities for active transportation for people of all ages, abilities and income.

A made in Hamilton version of Complete Streets that adopts a CLB streets approach was developed through the TMP review and update. This approach recognizes that no one-size fits all solution is appropriate for street design as different streets can have different priorities. CLB Streets calls for a range of design solutions depending on location, context and future role of the street.

The following seven street typologies respond to these contexts and are based on a review of the City's transportation corridors, existing policies and best practices to characterize the variety of conditions found in Hamilton:

- Urban Avenues
- Transitioning Avenues
- Main Streets
- Connectors
- Neighbourhood Streets
- Rural Roads
- Rural Settlement Areas

The CLB Streets Typologies do not supplant the City's functional road classification; however, it does provide additional design guidance, in line with Section 4 of the Official Plan. Further details about the typologies are provided in the CLB Streets Policy and Framework in.

The City's interest and investment in developing streets that are safe, accessible, accommodating of multiple modes and provide an attractive public realm are consistent with best practices. CLB streets are consistent with the ultimate goals of the Hamilton TMP and Hamilton's Strategic Plan priorities.

WHAT WE HEARD:



Complete-Livable-Better Streets was identified by 70% of public respondents as being the right policy direction for the City and was consistently mentioned as one of the top 5 priority areas.

Key recommended actions that support the implementation of CLB streets and ultimately a sustainable and balanced transportation system are summarized in Table 4.3. Additional details are included in the CLB Streets and Framework.

4.2.5.1 Street (One-to Two-way) Conversions

Hamilton's transportation system includes a network of one-way streets. There has been an ongoing public conversation and debate regarding the impacts of maintaining this network versus converting those streets to two-way streets since the introduction of the major system change in 1956. A number of streets have been converted back to their original two-way operation over the past 15 years, with more streets awaiting conversion based on previously approved sub-area transportation plans and Council direction. As directed by Council, the TMP Review and Update identifies a two-stage decision-making framework to address future requests for street conversions.

The first stage of the framework aims to evaluate individual conceptual road design alternatives against the following elements to determine whether a street conversion is preferred:

- Level of comfort
- Directness of routing
- Road safety (risk of collision)
- Travel time
- Emergency response impacts
- Capital cost impact
- Operating cost impact

The second stage of the framework identifies how to prioritize street conversions. This evaluation is based upon the City's Strategic Plan vision, mission and priorities and the TMP's vision and goals. This more detailed framework requires further refinement in collaboration with City staff and through public engagement.

Key recommended one- to two-way street conversion actions that support a sustainable and balanced transportation system are summarized in Table 4.3. Further details about the proposed street conversion framework are provided in the Street Conversion Paper.

4.2.6 Connectivity

Connectivity refers to the degree of connectedness within a transportation network to facilitate inter- and intra-city travel. In general, high connectivity is associated with lower isolation and higher access to routing options and travel modes, while low connectivity is associated with increased isolation and lower access to routing options and travel modes.

The planned urban structure in Hamilton coupled with direction from the Province to increase intensification targets will drive the need for the identified nodes and corridors to be served by improved seamless modal choices and an increased number of connections. Increased connectivity will also be driven by the need of people to better connect between modes and between parts of the community underserved by the transportation system.

Route continuity and integrity are very valuable in providing key connections to other modes, destinations, and supporting modal choice strategies. Discontinuous active transportation networks (e.g., sidewalks and cycling facilities) create barriers to expanding modal choice in the city. Despite the challenges relating to the staging of infrastructure implementation, continuous improvement to coordinate key linkages should be applied.

Inter-regional transit connections are provided through GO bus and rail service to adjacent municipalities, while the HSR and Burlington Transit operate routes connecting Hamilton and Burlington. Connections outside the urban transit boundary within the city are an on-going challenge. For example, the feasibility of introducing transit service in newly developed areas to create a culture of transit prior to establishing car dependent neighbourhoods. Once this culture is established, it is difficult to retroactively introduce transit in these areas. It is also difficult to sustain cost-recovery in these areas until they are fully built-out. This is also reflective in perpetual challenges in attaining aspirational modal splits.



Healthy and Safe Communities



Built Environment and Infrastructure

The concept of micro-transit could be an opportunity to address such challenges. Also related to transit, connectivity between origins and destinations and transit routes and hubs is referred to as first/last mile. Bike share is one example of a solution to first/last mile transportation.

The City of Hamilton continues to actively pursue opportunities to optimize the use of the existing transportation infrastructure to provide an active transportation network that contributes to a balanced transportation system. The future of transportation connectivity will rely on seamless connections between all modes of travel, all areas within Hamilton and all neighbouring municipalities. Also as part of the future, emerging technologies will facilitate improved connectivity and is identified in a latter section of this chapter.

Connectivity was not identified as a subject area in the 2007 TMP, but was identified as a priority as part of the TMP review and update process based on public engagement feedback. Connections between transit routes were identified as a specific challenge encountered in daily commutes while improving connectivity between Upper and Lower Hamilton was also identified as a priority for the review and update (PIC 1).

WHAT WE HEARD:



Improve connectivity between Upper and Lower Hamilton (including the consideration of alternative technology), and provide seamless connections between all travel modes.

Key recommended actions that support a sustainable and balanced transportation system through connectivity are summarized in Table 4.3.

4.2.7 Climate Change

Transportation is an essential participant in the climate change problem as well as its solution. More than 30 percent of GHG emissions are generated by the transportation sector. Cars and trucks generate approximately 70 percent of the transportation emissions. Annual transportation GHG emissions are forecast to continue to rise and become the leading source of GHG emissions by 2020, ahead of the industrial, buildings and electricity sectors.

The Province of Ontario's commitment and contribution to the global effort to combat climate change are described in the Climate Change Action Plan (2016-2020). The five-year plan provides a framework to help enable the people, businesses and municipalities in Ontario align efforts to fight climate change, reduce GHG pollution and transition to a low-carbon economy. The plan also sets out bold, measurable short- to long-term targets for reducing greenhouse gas emissions in Ontario: down 15

percent in 2020 from 1990 levels, down 37 percent in 2030 and down 80 percent in 2050.

In 2015, the Hamilton Community Climate Change Action Plan (CCAP) was developed to help the City address climate change and become more resilient to the impacts that are expected in and around Hamilton over the coming decades. Transportation was identified as one of the nine key focus areas for the CCAP.

The City's Corporate Energy Policy (2007, updated in 2014) also addresses climate change through energy conservation and renewable energy. The 2007 Energy Policy called for targeted energy reductions in energy intensity of City-owned facilities and operations of 20% by 2020. When the targets were met in 2013, the policy was updated to include new targets for energy intensity in City-owned facilities and fuel efficiency in City fleet vehicles. For example HSR's transit fleet is approximately 34% compressed natural gas.

Climate change was identified as one of the policy subject areas in the 2007 TMP, and continues to be an important consideration. Key recommended climate change actions that support a sustainable and balanced transportation system are summarized in Table 4.3, building upon the 2007 policy paper. It is recognized that climate change impacts on Hamilton's transportation system may need to be examined in more detail in the future (e.g., resilient infrastructure, emergency preparedness).

4.2.8 Emerging Technology

The transportation landscape is changing at a rapid pace. There has been an explosion of technology development that will continue to

transform how people move in the future. Emerging technology was identified as a new policy subject area as part of the TMP review and update.

There are three emerging technology trends that are expected to have a major impact on the future of transportation in Hamilton:

- Vehicles and the fuel they use (e.g. autonomous and connected vehicles, electric vehicles)
- People and the way they share vehicles (e.g. car share, bike share, personal transportation systems such as Uber)
- Information and communication (e.g. sensors, the internet of things, data analytics, smart cities)

More and more vehicles are being designed to be powered by alternative power sources including a combination of gas and electricity (hybrid), electricity and hydrogen. The City currently operates several charging stations for electric vehicles.

Car share, bike share and personal transportation systems are expected to continue to gain popularity in the future. The sharing of vehicles results in increased vehicle utilization rates, and reduced costs per vehicle kilometer traveled (VKT). Currently, two car share operators operate within Hamilton (Community Carshare and Zipcar). SoBi Hamilton is a bike share system that operates within the City. Information and communication are important components of emerging technology.

Examples of emerging information and communication technologies in transportation include:

- Vehicle features such as lane departure warning systems, autonomous emergency braking and pedestrian detection systems, GPS, Wi-Fi
- Autonomous vehicle control
- Connectivity of physical infrastructure (e.g., roads, traffic signals, parking spaces, lights)
- Information technology systems that support transportation planning, operations and maintenance (e.g., transportation system modelling, traffic management, work management, ongoing road works, geographic information systems (GIS), linear referencing)
- Applications that provide real-time information to the public (e.g. transit schedules, snow plow locations, etc.)
- Parking management and payment systems

Hamilton is currently engaged in the application of some emerging technologies. For example, Hamilton has been applying Intelligent Transportation System (ITS) technology to implement the ATMS. The system is operated from the Traffic Management Centre (TMC) and has the capability to provide up to date, real time traffic data aimed at responding to potential and evolving traffic issues on Hamilton roads. The system allows city staff to adapt and respond to changing traffic patterns relating to situations such as road closures, collisions, and other incidents in order to maintain safe and efficient use on the roads.

The integration of HSR's automated vehicle location (AVL) software within ATMS will enable the opportunity for transit signal priority (TSP) and improved transit efficiencies across the City.

WHAT WE HEARD:



The City should consider alternate and emerging technologies. Alternative and emerging technologies were researched for application in the Hamilton TMP for future consideration in policies and methods of transportation.

Incorporating and leveraging new technologies will enable Hamilton to anticipate the changes in the way Hamiltonians travel, incentivize preferred travel options, optimize traffic flows, support the elimination of traffic fatalities and serious injuries and track progress toward the transportation vision.

Key recommended actions related to emerging technology that support a sustainable and balanced transportation system are summarized in Table 4.3.

4.2.9 Intergovernmental Relations

Having strong intergovernmental relationships is vital in the planning, building and maintenance of a sustainable and balanced transportation system. The development of this policy theme incorporates two policy subject areas in the 2007 TMP, but also includes specific policies and actions relating to collaboration and partnerships to share information, improve efficiencies

and funding. The two policy subject areas identified in the 2007 TMP that were combined to form the new Intergovernmental Relations subject area as part of this TMP review and update are:

- Road Transfers
- Provincial Highway Initiatives.

Much of the transportation infrastructure connecting municipalities within the GTHA is governed and maintained through provincial bodies and agencies such as the Ministry of Transportation and Metrolinx. How these agencies relate, interact and reconcile with one another is important to economics, the environment, and the overall transportation system. As a result, it has become imperative that each municipality become open and aware of other regional players and agencies in order to deliver optimal service by providing a near seamless regional landscape. Interaction and collaboration with regional partners, provincial agencies and federal bodies requires continued commitment.

Hamilton is unique in its position from neighboring municipalities in that the City houses a variety of major goods movement hubs, including the Hamilton International Airport and the Port. These are discussed further in Section 6.2.3 (Goods Movement), and in the Goods Movement Paper. Hamilton is also unique in that it has municipal expressways (Red Hill Valley Parkway and Lincoln Alexander Parkway) which further connect residents of Hamilton with Provincial highways and other regional links. Through these connections, the City has the ability to promote and encourage intergovernmental transportation solutions.

Hamilton is currently involved in a number of intergovernmental transportation initiatives, partnerships and studies, including:

- Smart Commute
- GO Transit Service (train and bus)
- CycleON (Ontario's Cycling Strategy)
- BLAST rapid transit network
- Provincial designated goods movement strategy
- Provincial highway system planning
- Presto fare system
- MTO Greater Golden Horseshoe Transportation 3-Year Study
- Metrolinx Regional Transportation Plan (RTP)
- Niagara to GTHA Corridor Study (NGTA)

The City of Hamilton should be in a state of readiness for all projects that have allocated funding or are considered to be priority projects that the City could expect partial or complete funding from other governmental agencies. An example of this is the rapid transit network (BLAST). The identification and prioritization of such projects are discussed in more detail in Chapter 7, Recommendations and Implementation Tools, along with possible funding tools.

Key recommended actions related to intergovernmental relations and a sustainable and balanced transportation system are summarized in Table 4.3.

4.2.10 Summary of Other Applicable Policies

There are several other policy subject areas related to a Sustainable and Balanced Transportation System, including:

- Land Use and Travel Patterns
- Funding and Financing of Transportation Infrastructure
- Multi-Modal Level of Service
- Road Classification
- Urban Design
- Urban Structure and Growth

4.3 MODAL SPLIT ASPIRATIONS

Most cities in Canada have developed targets or goals to address various aspects of transportation system performance. These are generally aspirational targets that cities work towards. These may address specific transportation demand (e.g. a percentage of all trips to be accommodated by transit) or transportation supply (e.g. a percentage of residents to be within a certain walking distance of transit service).

Hamilton has recognized that existing travel patterns pose challenges in the context of a growing City that will need to accommodate more people and jobs by 2031. A significant majority of all daily trips are made by single-occupant vehicles, putting strain on the existing transportation network, and resulting in challenges with reliability of travel. As part of the 2007 TMP, the City set a range of targets to be monitored over time to understand how travel patterns are shifting. In general, the City has set targets for reduced single-occupant

vehicle trips, increased transit trips and increased walking and cycling trips. These aspirational targets assume intensification, growth, and funding of infrastructure and programs in support of alternative transportation, including transit, walking, cycling, and carpooling.

The near-term (2011) modal split targets from the 2007 TMP were not achieved as illustrated in Figure 4.3 and described in more detail in Section 2.2 (Catalysts for Change). Some likely reasons for this include lack of transit service in new growth areas, difficulty of changing habits (e.g. from driving to walking or cycling short distances or to taking public transit for longer distances), and lack of convenient transit or cycling connections between where people live and where they are employed. Land use factors including residential development in the periphery of the urban area is another possible reason. It could also be influenced by other factors such as the continued affordability of driving versus taking public transit. In spite of this, the City should continue to strive toward these aspirational targets set in the 2007 TMP.

It is recommended that the City continue to work towards achieving the long-term (2031) targets by incentivizing and enabling people to shift their travel to modes away from single occupant vehicles.

4.4 SUMMARY OF KEY RECOMMENDED ACTIONS

Numerous policy subject areas support a Sustainable and Balanced Transportation System. These subject areas, as well as the associated key recommended actions, are presented in Table 4.3.

FIGURE 4.3
Share of daily trips made by different modes of travel

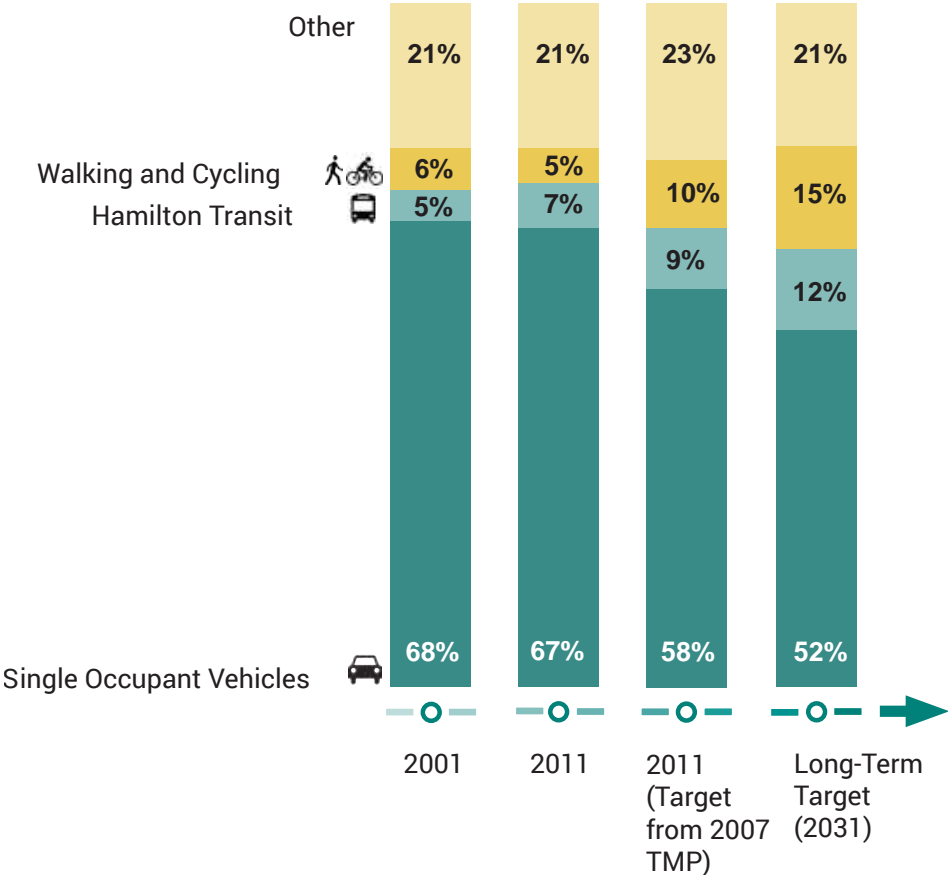


TABLE 4.3 Summary Actions

Policy Theme	No	Actions	Timing	Lead (Partners)
Sustainable Mobility (TDM)	1	Expand the reach and effectiveness of current Sustainability Mobility programs (Transportation Demand Management, TDM) to help achieve mode shift targets. This includes continued application of the TDM and Land Development Guidelines as part of development approvals.	Ongoing	PED (HSC)
	2	As part of future Official Plan and zoning by-law amendments, integrate TDM requirements such as end-of-trip facilities, car share, and public bike share.	Ongoing	PED
	3	Expand Smart Commute services to include a wider range of businesses and geographic coverage.	Short	PED (Metrolinx, NGOs)
	4	Apply individualized marketing (IM) and community-based social marketing (CBSM) as part of Sustainable Mobility programs.	Short	PED
	5	Coordinate School Travel Plans for every elementary school in the Hamilton-Wentworth District School Board (HWDSB) and Hamilton-Wentworth Catholic District School Board (HWDCSB) by 2022 in partnership with Healthy and Safe Communities (HSC), the Hamilton Strategic Road Safety Program, other City departments and local schools to identify safety and TDM opportunities.	Medium	PED (HSC, PW, local school boards)
Active Transportation	6	Update the prioritization framework for the Sidewalk Extension Program and establish an annual capital budget to address outstanding gaps based on community input.	Medium	PW (PED)

TABLE 4.3 Summary Actions

Policy Theme	No	Actions	Timing	Lead (Partners)
Active Transportation	7	Integrate walking infrastructure needs into the City's 10 Year Capital Budget so that opportunities for seamless, lower-cost development of pedestrian infrastructure is captured.	Ongoing	PW/PED
	8	Work across departments and in conjunction with developers and other stakeholders to enhance the walking environment through streetscaping measures and addition of amenities such as benches, street trees, public art, wayfinding.	Ongoing	PED/PW
	9	Work with the Hamilton Burlington Trails Council and neighbouring municipalities to advance the development of a greenway network within the natural, rural and urban areas of the City.	Long	PED (HSC)
	10	Create a business plan for the phased expansion of the public bike share and continue to enhance the system to connect with transit.	Short	PED
	11	Monitor, and where appropriate, enhance the maintenance program for pedestrian and cycling facilities (on- and off-road).	Ongoing	PW (on-road); Parks (off-road)
	12	Expand the existing City-wide wayfinding system to include the upper City and the former municipalities.	Medium	PED (PW)
Cycling Master Plan Review and Update	13	Maintain an annual capital budget for the implementation of the updated Cycling Master Plan and associated facilities.	Ongoing	PED

TABLE 4.3 Summary Actions

Policy Theme	No	Actions	Timing	Lead (Partners)
Cycling Master Plan Review and Update	14	Integrate cycling infrastructure needs into the 10 Year Capital Budget for all road reconstruction, rehabilitation and new roads as guided by the updated Cycling Master Plan, with an emphasis on achieving physical separation.	Ongoing	PW (PED)
	15	As part of the implementation of the cycling network, undertake an evaluation of alternatives in order to select routes which maximize safety for cyclists and promote continuity of the network across the City.	Ongoing	PED
Transit	16	Continue to advance planning for the implementation of the rapid transit network, as identified in Map 2.	Ongoing	PED (PW, Metrolinx)
	17	Ensure seamless connections between the City's rapid transit network and the regional transit network.	Ongoing	PED (PW, Metrolinx)
	18	Work with Metrolinx to advance designs and supporting business cases for remaining rapid transit corridors and extensions.	Long	PED (PW, Metrolinx)
	19	Advocate Metrolinx to accelerate the plans to provide two-way all day service on Lakeshore West to Hamilton, with extensions to Niagara Region, by 2020.	Short	PED (PW)
	20	Work with Metrolinx, neighbouring municipalities, post-secondary institutions and major employment destinations on regional transit connectivity.	Medium	PW

TABLE 4.3 Summary Actions

Policy Theme	No	Actions	Timing	Lead (Partners)
Transit	21	Review the cost, benefits and implementation feasibility for a demand-responsive service model that could provide transit service for lower-density areas which complement the existing HSR and regional transit networks. Demand-responsive service could also serve as a replacement for lower performing routes which do not meet service performance standards.	Long	PW
	22	Investigate the feasibility of early service agreements for new developments that would facilitate the implementation of transit in conjunction with new development. This could be extended to include transit service enhancements where service already exists.	Long	PED
	23	As part of ongoing traffic operation enhancements, road reconstruction and implementation of the rapid transit network, deliver a program of transit priority measures including reserved bus lanes, transit priority signals, queue jump lanes and other measures to improve the efficiency of transit. Priority will be given to the BLAST network.	Medium	PW
	24	Undertake comprehensive reviews of the HSR route network and service strategies at regular intervals (every five years) to ensure that the transit system adapts and growth with changing growth patterns.	Short	PW

TABLE 4.3 Summary Actions

Policy Theme	No	Actions	Timing	Lead (Partners)
Transit	25	Advance initiatives to continue to enhance the customer experience for transit including en route Wi-Fi, enhanced stops and shelters and enhanced real-time information.	Ongoing	PW
	26	Continue to work with neighbouring municipal transit agencies on fare integration, and advocate for Metrolinx to advance the development of an equitable regional fare integration strategy that does not adversely affect HSR ridership and revenues.	Medium	PW
Roads	27	Over time, move to a managed lane approach for Hamilton's parkway roads, including High Occupancy Vehicle (HOV) lanes, access control measures and other approaches that maximize existing capacity. Thresholds will be developed to assign capacity by mode to maximize throughput.	Long	PW
	28	Continue to advocate for provincial highway network improvements. The first priority for Hamilton is addressing congestion on Highway 403 through a Highway 403 Connections Study.	Medium	PED
	29	Continue to invest in and expand on the existing Advanced Traffic Management System (ATMS) within the City.	Ongoing	PW
	30	Proactively anticipate the impacts and opportunities related to connected and autonomous vehicles (AVs) on the operation of the road network.	Ongoing	PW

TABLE 4.3 Summary Actions

Policy Theme	No	Actions	Timing	Lead (Partners)
Roads	31	Implement the road network improvements as illustrated on Map 3 and in conjunction with applicable Secondary Plans, EA studies and area-specific transportation management plans. Timing of road improvements has been identified in Appendix A and will be subject to ongoing capital plan updates.	Ongoing	PW (PED)
	32	Continue to implement intersection modifications on an ongoing basis to address road network bottlenecks and improve safety for all users.	Ongoing	PW
	33	Adopt best practices for roadway and bridge design to respond to changing climate and frequency of extreme weather events.	Short	PW
	34	Work with Metrolinx and railway companies to plan and implement required railway grade separations based on applicable warrants. Pursue external funding sources, including the Transport Canada Rail Safety Improvement Program, for the construction of such crossings.	Medium	PED (Metrolinx, railway companies, Transport Canada)
Complete-Livable-Better (CLB) Streets	35	Adopt a CLB streets policy for road design, operation and maintenance. The CLB streets approach emphasizes routine accommodation in order to ensure designs consider the needs of users of all ages and abilities.	Short	PED
	36	Develop a CLB streets design manual for each typology, harmonizing existing applicable guidelines. A Vision Zero lens will be applied to the design of streets in new neighbourhoods and redesign of streets in existing neighborhoods.	Short	PED

TABLE 4.3 Summary Actions

Policy Theme	No	Actions	Timing	Lead (Partners)
Complete-Livable-Better (CLB) Streets	37	Harmonize the road classification and descriptions in the Official Plan with the CLB streets approach and undertake an Official Plan Amendment.	Medium	PED
	38	Use the multi-modal level of service (MMLOS) approach to evaluate road designs and facilitate the implementation of CLB streets. The MMLOS approach will also be integrated into Transportation Impact Study Guidelines as part of a major update to these guidelines (see Action 57).	Short	PED
	39	Integrate stormwater management Low Impact Development (LID) opportunities as part of CLB Streets designs where feasible.	Ongoing	PW (PED)
	40	Provide paved shoulders on rural roads where cycling is prevalent and/or where paved shoulders could benefit farm vehicles.	Ongoing	PW (PED)
	41	Evaluate options for providing sidewalks or multi-use trails in rural areas where the road leads to a school or community facility.	Ongoing	PW (PED)
One to Two-Way Street Conversions	42	Operationalize the one-way to two-way decision making framework identified in this TMP. Consider street conversions as a potential alternative within CLB streets evaluation.	Short	PW
Connectivity	43	Initiate a study to identify improvements to existing Niagara Escarpment crossings and methods and alternatives to move people and goods in a cost effective manner.	Long	PW (PED, Niagara Escarpment Commission)

TABLE 4.3 Summary Actions

Policy Theme	No	Actions	Timing	Lead (Partners)
Connectivity	44	Maximize the coordination and connectivity of bicycle, pedestrian and transit networks (including public bike share) to improve first and last mile connections to transit.	Ongoing	PED/PW
Climate Change	45	Promote the importance of reducing GHG emissions from transportation, managing fleet operating costs and achieving the City's Corporate Average Fuel Economy (CAFÉ) targets energy conservation in transportation and ensure Hamilton plays a role in achieving Federal, Provincial and its own commitments to reduce GHG emission reductions.	Ongoing	PW
Emerging Technology	46	Identify opportunities for and run pilot projects to assess the applicability and/or feasibility of implementing new technological opportunities, such as mobility as a service.	Ongoing	PW/PED
	47	Work across departments to use "Big Data" to inform transportation planning decisions, provide better services for the travelling public and reduce net costs.	Short	Corporate Services
	48	Support the transformation of the transportation system to create a "smart city" (intelligent community).	Medium	Corporate Services
Intergovernmental Relations	49	Proactively work with the Ministry of Transportation (MTO), Metrolinx, other provincial/federal agencies and neighbouring municipalities to advance regional transportation initiatives within and beyond the City.	Ongoing	Multiple leads

Health and sustainability has become a key value of the TMP review and update. The sustainability of Hamilton and the health of its residents must be reflected in all decisions related to transportation.



Chapter 5

Healthy and Safe Communities

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Chapter 5

Healthy and Safe Communities

As introduced previously, the TMP review and update process identifies three key outcomes for the transportation system (Figure 5.1). This chapter focuses on Healthy and Safe Communities.

Health was not identified as a specific policy theme in the 2007 TMP review and update although health concepts were embedded within a number of policy papers including Land Use and Travel Patterns, Urban Design, Urban Structure and Land Use.

As part of the development of the scope of the TMP review and update, City Council provided direction regarding the importance of including health, which has evolved to become a central theme in the TMP. This direction was in response to a document prepared by the Medical Officers of Health in the GTHA titled “Improving Health by Design in the Greater Toronto-Hamilton Area” (May 2014, 2nd Edition). Through the public engagement process as part of this TMP, the message of health was reaffirmed by the public through the desire to include it as part of the revised plan vision.

Road safety was also not specifically identified as a policy theme in the 2007 TMP. Similar to health, a number of road safety recommendations were made such as traffic calming and management. Road safety will continue to be an important priority for Hamilton’s transportation system. More recently, this priority has been elevated to a higher level, through Council’s direction to staff to provide a comprehensive plan to further improve road safety in Hamilton.



Healthy and Safe Communities

FIGURE 5.1 Desired Outcomes of Hamilton’s Transportation System



Part of this direction was to examine the internationally renowned Vision Zero approach to road safety.

In addition to being aligned with Hamilton’s Strategic Plan, this is also aligned with part of Metrolinx 2041 Regional Transportation Plan (RTP).

Table 5.1 summarizes the TMP review and update performance indicators associated with Healthy and Safe Communities. To achieve these long-term targets and goals, the following sub-sections and associated policy themes identify some of the key actions and associated measures of success. A complete list of actions associated with Healthy and Safe Communities are identified in Table 5.2.



Clean and Green



Built Environment and Infrastructure

5.1 NEW DIRECTIONS AND/OR POLICY LINKS

The following sections summarize the key policy subject areas that support Healthy and Safe Communities.

5.1.1 Health and the Built Environment

Many factors contribute to the health of individuals and communities. Determinants of health at both the individual and community level align with the sustainability pillars and can be categorized into social, economic, and environmental factors, including¹³:

- Income and social status
- Social support networks
- Education and literacy
- Employment and working conditions
- Social and physical environments
- Personal health practices and coping skills
- Healthy child development
- Biology and genetic endowment
- Health services
- Gender
- Culture
- Language

TABLE 5.1 Summary of key performance indicators

Policy Theme Area	Performance Indicator(s)	Future Signs of Success
The Role of Health and the Built Environment	Physical activity rates	↑
Road Safety	Road fatalities and serious injuries (number and rate)	↓
Accessibility	Transportation infrastructure compliance with AODA	↑

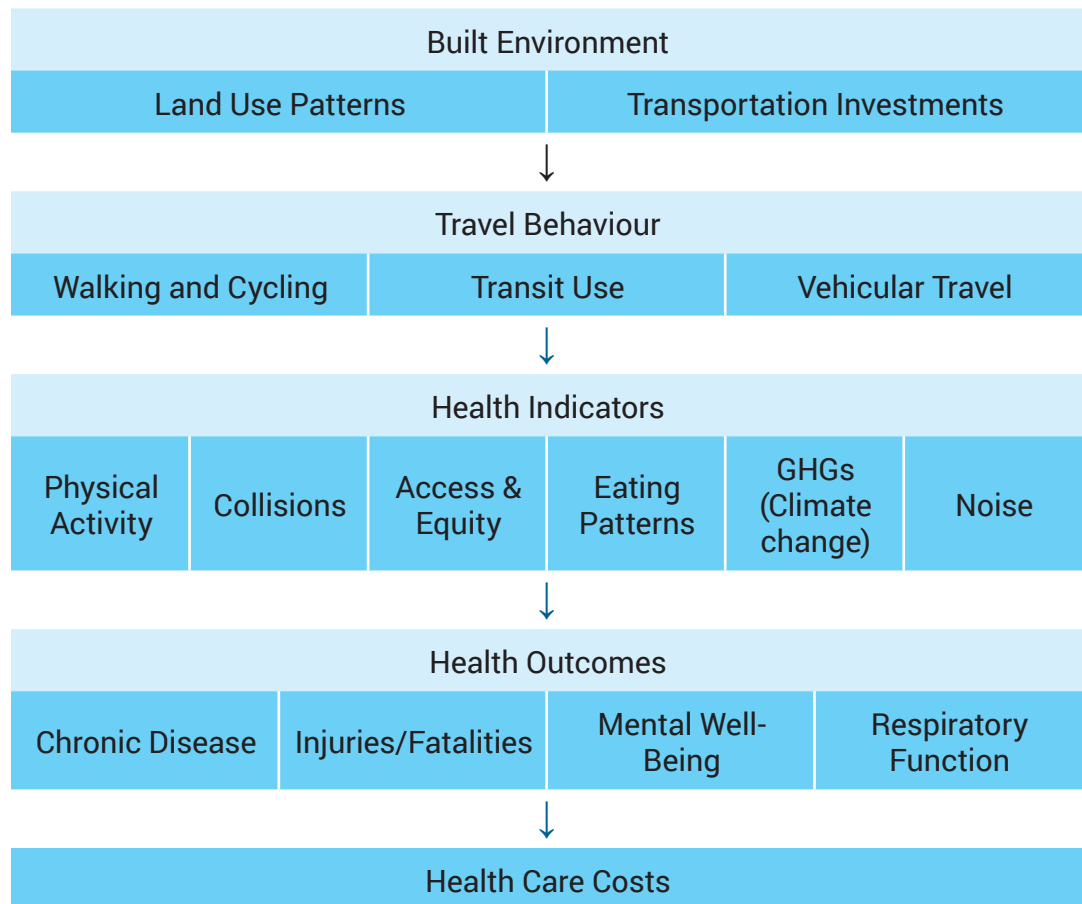
¹³Public Health Agency of Canada: What Determines Health?

One of the primary connections between the determinants of health and transportation is the physical environment, which includes the built environment. In the built environment, factors related to the design of communities and transportation systems can significantly influence our physical and psychological well-being¹⁴. Figure 5.2 illustrates the relationship between health outcomes and the built environment in more detail.

investments can establish the framework for land use decisions¹⁵. The built environment ultimately influences our activity levels and therefore health outcomes through the transportation choices that are available¹⁶. If convenient and accessible alternative transportation choices are not available it is difficult for travel behaviour change to occur. Land use and transportation planning processes in Hamilton need to be better integrated in order to achieve a healthier city.

Land use patterns determine the type of transportation infrastructure and service, while new transportation

FIGURE 5.2
Relationship between the Built Environment and Health Outcomes



¹⁴ Public Health Agency of Canada: What Determines Health?

¹⁵ Transportation and Health: Context Report (2013)

¹⁶ Improving Health by Design in the Greater Toronto-Hamilton Area (2014)



Built Environment and Infrastructure

The provision of a sustainable and balanced transportation system that focuses on public transit, active transportation and accessibility will enable healthier transportation choices and improve the health of individuals and the overall health of the City.



Healthy and Safe Communities

Key health outcomes related to the built environment include chronic disease, injuries/fatalities, mental well-being, and respiratory function. Regular physical activity through active transportation, for example, provides health benefits and helps prevent chronic diseases such as obesity, hypertension, diabetes, and cardiovascular disease, which can generally be prevented or mitigated¹⁷. In addition to physical activity, other important health indicators related to transportation planning include collisions (i.e. road safety), access and equity, eating patterns, GHG emissions and air quality. Road safety, access and equity are described in more detail in the following sections. Transportation and GHG emissions and air quality were previously discussed as part of climate change.

5.1.2 Road Safety

Safety in transportation is an important element in reaching the City’s vision and in creating healthy and safe communities.

Over the 5-year period from 2013-2017, there was on average 14 fatal collisions each year and over 1,800 non-fatal injury collisions. These fatal and injury collisions together represented 50% of all reported collisions in Hamilton over that time period, but resulted in approximately 96% of the total collision cost to society (Figure 5.3). Not only are

fatalities and severe injuries on the road unacceptable from an ethical perspective, they are also unacceptable from a societal cost perspective.

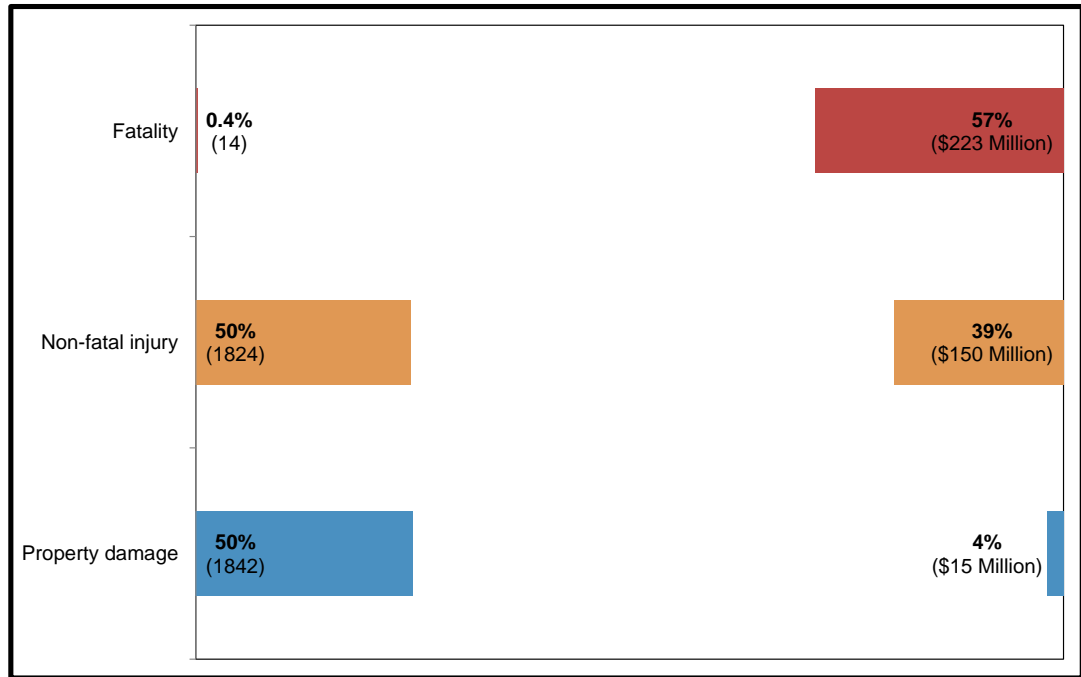
There are opportunities to make safety an integral part of roadway planning and design, transportation decision-making, as well as everyday behaviours of those who use the transportation system. The City is committed to improving road safety, and has achieved several major milestones. In 2000, the Red Light Camera Program (RLC) was established with the intention of improving road safety by reducing incidents of angle collision at traffic signals. Revenue from this program is used to fund safety initiatives. In 2007, the Hamilton Strategic Road Safety Program (HSRSP) was initiated and released a Road Safety Action Plan in 2009. The Hamilton Strategic Road Safety Program delivers a number of initiatives (e.g., neighbourhood and local roadway speed limit reductions).

Vision Zero is a proactive approach to road safety, with the simple and clear goal of zero fatalities or serious injuries on roadways. An important element of Vision Zero is that road safety takes precedence over operations and convenience. Vision Zero focuses on:

- Fatalities and serious injuries
- Flaws in the transportation system as cause of collisions
- Perfecting road systems for imperfect human behaviour
- Safety initiatives to reduce societal costs

¹⁷ Improving Health by Design in the Greater Toronto-Hamilton Area (2014)

FIGURE 5.3 Average Annual Social Cost of Collisions by Type (2013-2017)*



*Average social costs of fatal, non-fatal and property damage only collisions in Ontario from Analysis & Estimation of the Social Cost of Motor Vehicle Collisions in Ontario, Final Report, 2007, Transport Canada. Collision data average over 5 year period (2013-2017) in Hamilton. Includes reported collisions.

Vision Zero is an engaging and open program, which embraces the community and supports local prosperity by striving towards a safe, reliable road network. It encourages active modes of transportation by addressing road safety for vulnerable road users, reducing contributions to climate change and encouraging a healthy lifestyle.

Many cities around the world have adopted or are considering the Vision Zero approach. This approach is part of Canada’s Road Safety Strategy 2025 and the Ministry of Transportation of Ontario Vision. Currently Hamilton is exploring the cost associated with operationalizing Vision Zero.

Vision Zero aims for safer streets by addressing traffic safety holistically through five main elements: education, enforcement, engineering, evaluation and engagement (see Figure 5.4)¹⁸. To achieve improvements to road safety, all of the elements need to be implemented in a coordinated and strategic manner. This is complimentary to the CLB streets approach.

The relationship between these elements and current recommended practices at the City of Hamilton are described in the following sections. It should be emphasized that no single element on its own will result in success. Rather a combination of several elements, if not all of them at once, greatly improves the potential

¹⁸ From general engineering best practices. Often 3 Es are used, however this has evolved and expanded over time.

for successful results. Further details are provided in the Road Safety Paper.

Hamilton Strategic Road Safety Program Mission and Vision:

“To make roadways throughout the City of Hamilton the safest throughout North America and to address safety for ALL road users, including vulnerable road users such as seniors and children and to reinvest Red Light Camera (RLC) revenue into safety initiatives in the Community.”

Engineering

Engineering refers to the design, construction and operation of roadway assets including roads (including pedestrian and cycling facilities), bridges, culverts and tunnels.

Traffic calming and management, for example, is an approach to designing, constructing and operating neighborhood roadways and features to promote all travel modes. Techniques to reduce the impacts of traffic on neighbourhoods and other public facilities such as parks, school areas, and community centres can include speed humps and curb extensions, roundabouts, partial

or full road closures, and various streetscaping elements.

Although traffic calming and management is primarily addressed through engineering practices, it can also be addressed through enforcement and education. Traffic calming was one of the policy subject areas from the 2007 TMP. The City developed a Traffic Calming Management Policy in 2007 which was updated in 2013 and most recently in 2015. The City’s traffic calming and management program supports the PMP, is consistent with the Complete-Livable-Better (CLB) streets approach, and aligns with the Hamilton Strategic Road Safety Program. Traffic calming and management continues to be an important component of healthy and safe communities. This, along with a holistic approach to road design as part of the CLB Streets Design Manual, will facilitate improved design within new developments as well as within the existing built form.

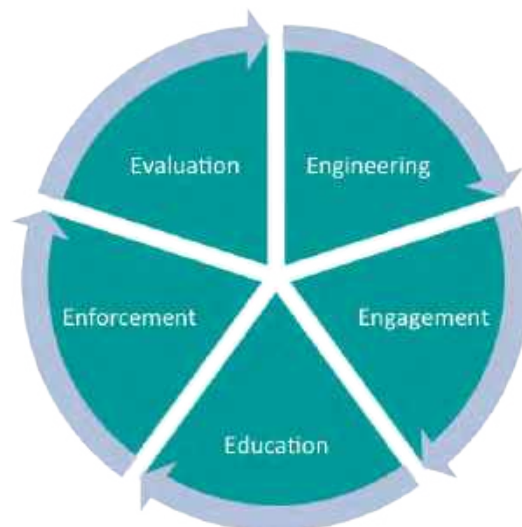
A summary of actions that support traffic calming and management and healthy and safe communities are provided in Table 5.2. Additional details are included in the Road Safety background report.

Engagement

Enhanced community engagement to create a safe roads culture is another important component of community safety. Promotional campaigns, community-based engagement and workshops are just a few methods to be considered on an on-going basis. Many of the engagement tools being utilized today are consistent with the City’s public engagement charter.



FIGURE 5.4
Elements of Vision Zero



Education

Education includes targeted and collaborative campaigns to address safety for all road users. Education and awareness is one of the ways that the program works to facilitate a measureable shift in travel behaviour. The City and community partners work together to help provide curriculum materials related to active and sustainable travel, including the delivery of hands-on cycling training and school travel planning for participating schools. Other examples include the provision of cycling and transit training for seniors, as well as training for residents when new infrastructure or services are introduced within their area.

A current example of education is the “Slow Down Safety Zone” initiative led by the Hamilton Strategic Road Safety Program (Figure 5.5). These lawn signs, available to all residents of Hamilton, promote safer streets and remind drivers to reduce their speed in residential areas. Other examples of education initiatives include the PXO program and the Distracted Driving program.

Enforcement

Enforcement includes the strategic use of enforcement resources in key areas for maximized effectiveness. The City’s RLC program is an example of enforcement. It is designed to modify aggressive driving behaviour and increase awareness of the dangers of running red lights. Specific intersections within the City have red light cameras that are set so that vehicles that enter an intersection after the light turns red are photographed. Vehicles are then fined for their violation and revenue from those fines is re-invested into

other safety initiatives. Another example of enforcement is targeted safety blitzes within school zones and other areas identified by the community, sometimes referred to as project-oriented policing. Recently, Bill 65, Safer School Zones Act, 2017, was approved by the Provincial Legislature. Once the regulations are finalized, it will permit municipalities to utilize Automated Speed Enforcement to address specified areas as permitted under the new regulations. Finally safety measures integrated within the built environment provide natural “engineered” enforcement.

Evaluation

Evaluation includes the identification of key challenges on Hamilton’s road network using a data-driven approach. The City is actively involved in collecting and monitoring data related to transportation and safety, including traffic volume and collision data (including collision data from police reports and self-reports). The City’s new Advanced Traffic Management System (ATMS), other emerging technologies and the sharing of data with neighbouring



Healthy
and Safe
Communities

FIGURE 5.5 “Slow Down Safety Zone”
Lawn Sign



municipalities and the MTO all have the potential to further support the evaluation of road initiatives.

Key recommended safety actions that support healthy and safe communities are summarized in Table 5.2. Additional details are included in the Road Safety Paper.

5.1.3 Accessibility

The Accessibility for Ontarians with Disabilities Act (AODA) defines accessibility as the design of products, devices, services, or environments for people who experience disabilities. Access is more broadly defined as the degree to which individuals have the ability to reach desired goods, services, activities and destinations, and includes the accommodation of users of all ages, ability and income. Both accessibility and access are very important considerations for the transportation system.

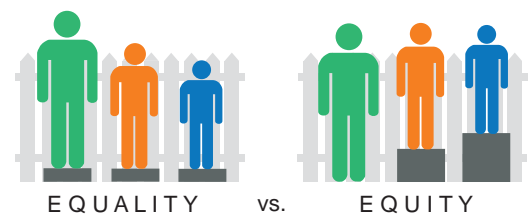
According to the Ontario Human Rights Commission (OHRC), equity is, “A distinct process of recognizing differences within groups of individuals, and using this understanding to achieve substantive equality in all aspects of a person’s life.” The outcome of this is providing an equitable transportation system, which may or may not be the same as equality. For example, kneeling busses as part of the conventional transit system and ATS are two different forms of transit that can lead to equitable outcomes. In a similar regard, the City should be sensitive to providing an inclusive transportation system that takes into account diversity. These concepts are illustrated in Figure 5.6.

The Integrated Accessibility Standards was enacted in 2011 under the AODA Act. This new regulation addresses barriers being faced by persons with disabilities in areas of transportation, employment and information and communications

- **Transportation Standard** focuses on making transportation services accessible including buses, trains, subways, streetcars, taxis and ferries.
- **Design of Public Spaces Standard** provides regulations for new construction and extensive renovations.

The TMP review and update recognizes the continued importance of AODA compliance in the future. The City’s Multi-Year Accessibility Plan (2013–2017) provides details about accessibility initiatives that the City has or is undertaking. It includes a report on steps taken to identify, remove and prevent barriers to people with visible and invisible disabilities, and sets out how the City assesses its proposals for by-laws, policies, programs, practices and services.

FIGURE 5.6
Difference between Equality and Equity



Examples of equity elements in Hamilton's transportation system include:

- Urban Braille
- Accessible Transit Service (ATS)
- Subsidized transit and bike share passes

Examples of initiatives that have been undertaken to increase transportation accessibility include:

- Transit initiatives
 - Accessible Low Floors (ramps) on all busses
 - Audio and visual stop announcements for all transit stops (bus speakers will announce the approaching bus stop and the LED sign displays the stop name)
 - Request Stop Program (after 8 p.m., drivers will let passengers off between regular bus stops on a request basis)
 - Senior, children and student fares
 - Affordable Transit Pass Program
 - Provision of Accessible Transportation Services (Disabled and Aged Regional Transportation System (DARTS) and Taxi Scrip Program).
- Other initiatives
 - Everyone Rides Initiative Pilot (2017) (bike share equity program that provides subsidized passes)

- Approval of the Pedestrian Mobility Plan (2013)
- Optimization of pedestrian signal timing for longer walk times
- Accessible Pedestrian Signal (APS) operation at numerous locations
- Installation of Urban Braille (accessible sidewalk system) within strategic areas
- City-wide customer service policies (e.g., Assistive devices policy, communication policy, service animals policy, support persons for person with disabilities policy)

Another important consideration related to accessibility is that Hamilton's demographics are changing (refer to Section 2.2). Perhaps the most significant expected change is the aging population. The City's Age-friendly Plan is aligned with the City's Strategic Plan vision and priorities. The TMP review and update is also aligned with the Age-Friendly Plan, especially one of the Age-Friendly Plan's strategic goals.

Meeting the needs of an aging population will be increasingly important in the provision of built environments, services and programs. Transportation planning and decision-making to support the successful aging of citizens in the future will be an essential part of developing safe and healthier communities. As emerging technologies are considered for adoption, a test for age-friendliness, accessibility and equity should be a requirement.

WHAT WE HEARD:



Consider accessibility for people of all ages, abilities and income.

Accessibility was one of the policy subject areas from the 2007 TMP, and will continue to be an important consideration to 2031 and beyond. A summary of key recommended accessibility actions that support healthy and safe communities are summarized in Table 5.2.

5.1.4 Other Applicable Policies

There are several other policy subject areas related to Healthy and Safe Communities, including:

- Complete-Livable-Better streets
- Sustainable Mobility
- Active Transportation
- Emerging Technology

5.2 SUMMARY OF KEY ACTIONS

A number of policy areas support a healthy and safe transportation system. These areas, as well as the associated key recommended actions, are presented in Table 5.2.

TABLE 5.2 Summary of Actions

Policy Theme	No	Actions	Timing	Lead (Partners)
Health and the Built Environment	50	Include health outcomes (chronic disease, respiratory function, injuries, mental health, and health care costs), where possible, in the evaluation of transportation designs, projects and policies, in collaboration with Public Health staff and professionals.	Ongoing	HSC
Road Safety	51	Integrate the goals and principles of Vision Zero into the CLB streets design manual and Engineering Guidelines.	Short	PED
	52	Establish a Vision Zero Task Force that includes multiple partners, leaders, public and private businesses, school boards and public health as a sub-committee to the Hamilton Strategic Road Safety Committee.	Short	PW
	53	Implement a comprehensive collision data collection system integrating multiple modes of transportation and overlaying built environment data.	Ongoing	PW
	54	Apply speed reduction techniques through the implementation of CLB streets as well as through other opportunities such as the introduction of protected cycling facilities.	Ongoing	PW (PED)
Accessibility	55	Support the delivery of age-friendly and accessible transit training and training for other modes run by non-governmental organizations.	Short	PED (HSC, PW, NGOs)
	56	Develop education around sidewalk etiquette and the role of mobility devices.	Short	PED (HSC)

Chapter 6

Economic Prosperity and Growth

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Chapter 6

Economic Prosperity and Growth



Economic Prosperity and Growth

Economic prosperity and growth is a desired outcome (Figure 6.1) of the TMP review and update and important for the City of Hamilton. It is embodied in the City’s Strategic Plan vision, mission and priorities. It is also identified within the City’s Economic Development Action Plan (2016–2020). Integrated transportation planning and supporting infrastructure helps to enable this Council priority.

The TMP review and update identifies a number of related policy theme areas that contribute to economic prosperity and growth including Land Use and Travel Patterns, Parking,

Economic Development, and Goods Movement. Each is described in this chapter. Another important element is the relationship between the TMP and the Growth Plan, the Province of Ontario’s growth and development plan (2017), and in the RTP (The Big Move).

Table 6.1 summarizes the TMP review and update performance indicators associated with Economic Prosperity and Growth. To achieve these targets and goals, the following sub-sections and associated policy themes identify some of the key actions and associated measures of success.

TABLE 6.1 Summary of key performance indicators

Policy Theme Area	Performance Indicator(s)	Future Signs of Success
Land Use and Travel Patterns	Average journey to work trip distance (km)	↓
Economic Development	Transit service to Employment Lands	↑
Goods Movement	Cargo movements	↑

6.1 PLANNING FOR ECONOMIC PROSPERITY AND GROWTH

The Strategic Plan's community vision for economic prosperity and growth identifies Hamilton as an ambitious place where people successfully provide for themselves and their families and have quality and well-paying local job opportunities. It further identifies that Hamilton has a prosperous and diverse local and regional economy that benefits all residents. Signs of economic prosperity and growth related to transportation include local job opportunities, thriving local businesses, efficient goods movement, and less reliance on the residential tax base to fund municipal services.

FIGURE 6.1 Desired Outcomes of Hamilton's Transportation System



Efficient access for industries and businesses to markets, employees and customers through transit corridors, goods movement routes (road, rail, shipping and air) and the road network is an important enabler of a strong local economy.

It also means linking the businesses that provide local employment opportunities to employees so that travel distances are shorter and more options for travel are made viable. Connections to educational opportunities help to ensure children, young people, and others have access to various education programs. This will enable them the opportunity to learn, develop and utilize the skills they need to be successful in work and in life in Hamilton.

The update of the Big Move RTP recognizes the contributions of goods movements to the GTHA's economic prosperity. It identifies that goods movement is fundamental to the functioning of our economy. Every good and many services require transportation to get to market. Goods movement can be said to be cost effective when it achieves desired levels of reliability, environmental protection, and safety at the lowest possible cost.

Part of the proposed RTP vision update aligns with the work undertaken as part of the TMP review and update as identified in Chapter 2 of this report.

6.2 NEW DIRECTIONS AND/OR POLICY LINKS

The relationship between transportation planning and land use, economic development and goods movement is important to achieving the vision identified in both the City's Strategic Plan and TMP review and update. Where people choose to live and work has a direct impact on transportation demand patterns and their associated infrastructure needs. This also applies to the development of employment lands, freight-

supportive land uses and strategies, and their associated supply-chain and transportation logistics requirements and proximity to infrastructure and intermodal hubs.

Similarly, the type of infrastructure provided to facilitate the movement of people and goods also influences land use patterns and how well the infrastructure itself is utilized. The sections that follow summarize the key policy subject areas that support Economic Prosperity and Growth.

6.2.1 Land Use and Travel Patterns

The Land Use and Travel Patterns policy theme area includes past, present and future land use and transportation trends, focusing on macro-level travel patterns, including place of residence and place of work trends.

This was one of the 2007 TMP policy subject areas and will continue to be an important subject area to 2031 and beyond. Since the 2007 TMP a number of studies, plans and initiatives related to land use and economic prosperity and growth have been undertaken and/or initiated, including, but not limited to:

- Rural Hamilton Official Plan (adopted 2006, effective 2012)
- Urban Hamilton Official Plan (adopted 2009, effective 2013)
- Ancaster Wilson Street Secondary Plan and Official Plan Amendment (2012) and Ancaster Transportation Master Plan (2011)
- West Harbour Secondary Plan and Transportation Master Plan (Setting Sail; 2012)

- B-Line Nodes and Corridors Land Use Planning Study and Mid-Rise Development (2011)
- Zoning along the B Line (e.g., Transit Oriented Corridor Zones; 2016)
- Downtown Hamilton Secondary Plan and Transportation Master Plan (Secondary Plan review adopted by Council in April 2018)
- Centennial Neighbourhoods Secondary Plan and Transportation Management Plan (adopted by Council in 2018)
- Commercial and Mixed Use Zones zoning by-law (adopted by Council in 2017)

The City also influences land use and travel patterns through its GRIDS growth management strategy, which identified a nodes and corridors preferred growth option as the basis for growth and change in the City.

As defined in the Urban Hamilton Official Plan, Hamilton's urban structure includes the following structural elements (illustrated in Figure 6.2):

- **Urban Nodes** – discrete areas that contain compact, mixed-use (residential, commercial and institutional) development and service the surrounding areas. They are accessible by higher order transit, active transportation, a good road network, and exhibit high quality urban design. The OP identifies three types of Urban Nodes:
 - Downtown Urban Growth Centre (e.g. Downtown Hamilton)
 - Sub-Regional Service Nodes (e.g. Limeridge)

- o Community Nodes (e.g. Downtowns of the former municipalities)
- **Urban Corridors** – areas of street-oriented uses which incorporate a mix of retail, employment and residential uses, developed at medium densities, located along arterial or collector roads serving as major transit routes. Such corridors may form the boundaries of residential subdivisions or neighbourhoods, but should act as a linear focus for activities and uses within the community. The OP identifies two types of Urban Corridors:
 - o Primary Corridors (e.g. segments of Main-King-Queenston)
 - o Secondary Corridors (e.g. segments of Rymal Road)
- **Major Activity Centres**
- **Neighbourhoods**
- **Employment Areas**
- **Major Open Space**

The current Urban Official Plan also provides direction related to land use and travel policies. It includes the principles that provide guidance for the development of:

- The City's nodes and corridors and their focus on re-urbanization
- Connections within and between nodes and corridors through the use of transportation solutions including higher-order transit (e.g. BLAST, with connections to regional transit networks such as GO Transit)
- Vibrant pedestrian environments

- The facilitation of active transportation
- Higher residential density
- Mixed use development

These principles highlight the need to invest in pedestrian, cycling and transit infrastructure that support shorter trip distances. This will create wider access for active modes of transportation and enable the first/last mile connections to transit (e.g. bike share).

Key recommended actions related to land use and travel patterns that support economic prosperity and growth are summarized in Table 6.2.

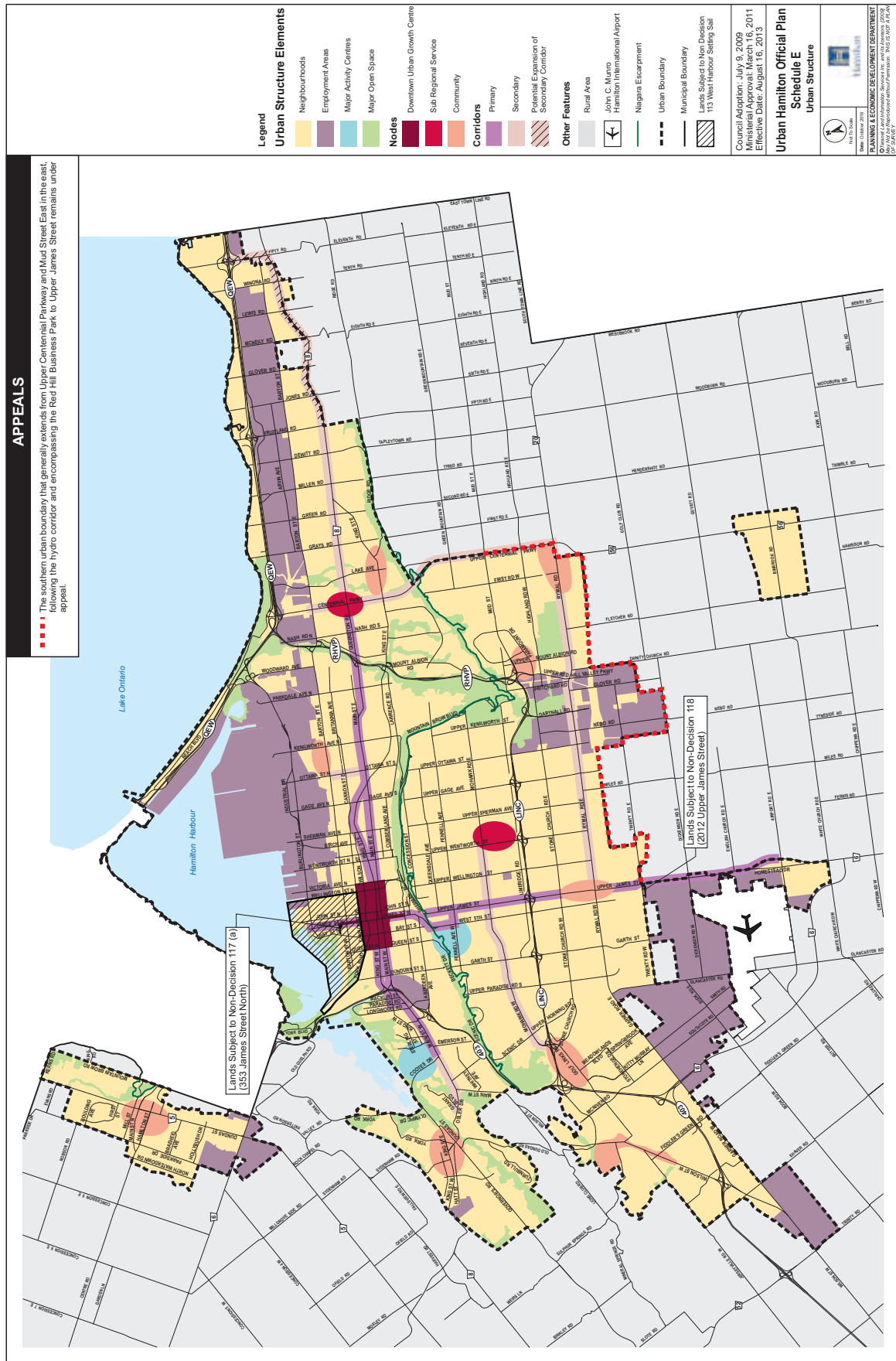
6.2.2 Parking Strategy

Parking influences both transportation and land use patterns. Having effective parking management strategies can support modal choice and active modes of travel, transit-oriented development, and ultimately economic growth. Pricing strategies, Zoning By-Law requirements, and the application of emerging technologies can improve the efficiency of the municipal parking system and improve customer experience. As Hamilton shifts towards a balanced approach to transportation, there is a need to integrate parking through the development of a city-wide parking master plan.

Best practices now focus on setting maximum parking standards as opposed to minimum parking standards to ensure parking supply is balanced with mode share targets and urban design objectives.

On-street parking management will be a consideration within the operationalization of CLB streets in Hamilton. Creating opportunities

FIGURE 6.2 Hamilton Urban Official Plan – Urban Structure (as of February 2017)



to embed carpool, park and ride and electric vehicle parking within off-street municipal parking lots and other municipal facilities will provide a network of facility types that will encourage sustainable travel. Leveraging technology to provide diverse payment methods, pricing strategies such as dynamic pricing, and improve parking demand monitoring and enforcement practices will help to improve system efficiencies and integrate shared mobility options.

In addition, the new intensification targets for the City will put additional pressure on redevelopment of surface parking lots, especially within downtown. A key objective of the Parking Master Plan will be to project future parking needs and establish the right amount of public parking to support economic development and business needs, while also contributing to TDM goals. As such, appropriate financial planning is important, especially recognizing the cost to construct a structured parking space is typically \$35,000 - \$50,000 per space. Increasingly, structured parking will serve to support multi-modal and emerging transportation alternatives including car-share, bike-share, electric vehicle parking and potentially peer-to-peer car-sharing models. Key recommended parking actions that support economic prosperity and growth are summarized in Table 6.2.

6.2.3 Economic Development

Hamilton's economic development mandate is to create and retain living wage jobs, increase the non-residential tax base, and increase the City's attractiveness as "the best place to raise a child and age

successfully." This is supported by several goals and stretch targets, which is supported by the TMP review and update.

Economic Development was identified as a key priority in the 2007 TMP and will continue to be so to 2031 as the City continues to grow and the economic landscape continues to evolve. Since 2007, several studies, plans and initiatives related to economic development have been completed or initiated, including:

- Hamilton Economic Development Action Plan (EDAP) (2010–2015 and 2016–2020)
- Airport Employment Growth District (AEGD) Secondary Plan and Transportation Master Plan (2011)
- Bayfront Industrial Area Strategy (initiated in 2016, currently in progress)
- Tourism Strategy (2015-2020)
- Cultural Plan (2013)

Hamilton's economy has traditionally been dominated by production and manufacturing. However, recent changes in Canada's economic landscape have seen the professional services (e.g. health care, education) flourish with a higher emphasis on tertiary industry supporting these professional services. The creation of business parks and the diversification of knowledge bases, coupled with the drastic increase in post-secondary educated workforce, have led to the demand and growth of these services. Hamilton's current key industry sectors include:

- Advanced manufacturing
- Agriculture/food processing
- Creative/cultural industries

- Finance/Insurance/Real Estate
- Goods Movement
- Information and Communication Technology/Digital Media
- Life Sciences
- Tourism

Emerging economies are another important influence on Hamilton’s economy. The advent of concepts such as the sharing economy and mobility-as-a-service are changing the way we view asset ownership, including transportation assets, and are expected to have a major influence on both the economy and the transportation system.

Hamilton’s EDAP was updated in 2016 in conjunction with the review and update of other city-wide strategic documents. The action plan aims to ensure that Hamilton remains Canada’s most diversified economy. It also identifies six goals, three of which relate directly to the transportation system:

- **Grow non-residential tax assessment and increase the number of living-wage jobs:** this relates to attracting and retaining new employers, employees and residents.
- **Vibrant commercial and cultural districts and places:** this can be achieved through urban renewal initiatives and creating places for people through building Complete Communities, and Complete-Livable-Better (CLB) streets
- **Strategic infrastructure investment for economic growth:** the link between emerging technologies and integrating smart city (intelligent communities) concepts to improve the efficiency of moving people and goods

The action plan recognizes that transit is a major opportunity by identifying it within the transportation infrastructure area of focus, including:

- Implementation of the LRT project (ongoing)
- Providing regular, reliable and frequent transit access to all business parks (short-term)
- Completing the rapid transit network (BLAST) to link workers to employment areas across all parts of the city (long-term)
- Expanded regional GO service (Two Way-All Day Rail service, GO bus service to Confederation station)

It also states an ambitious stretch target, that by 2020, we will: extend regular HSR service (connected to the BLAST network) to the interior of the Red Hill, Flamborough and Stoney Creek Business Parks, and 24/7 service to John C. Munro Hamilton International Airport.

In summary, provision and promotion of employment transit options, goods movement strategies, increased intermodal connections and the use of emerging technologies are all important to the prosperity and growth of Hamilton’s economy. Key recommended economic development actions that support economic prosperity and growth are summarized in Table 6.2.

6.2.4 Goods Movement

Effective goods movement and freight-supportive land uses support local, regional and international markets, which contributes to Hamilton’s economic prosperity and growth. Hamilton is located at the centre of the most densely populated corridor of economic activity in Canada. Hamilton’s location provides

businesses with easy access to a network of highways, international rail lines, local air connections and marine connections, including:

- The provincial 400-series highway system (Queen Elizabeth Way (QEW) and Highways 401 and 403), connecting the GTHA with the U.S. Eastern Seaboard and the Midwestern states
- The Port of Hamilton (Hamilton Port Authority, HPA) and John C. Munro Hamilton International Airport (HIA), connecting Hamilton and the surrounding region with other domestic and international markets. The lands surrounding both the port and airport will attract employment growth in transportation logistics and distribution, and the non-traditional manufacturing and processing sectors
- Hamilton's proximity to the Canada-U.S. border crossings at Fort Erie-Buffalo, Queenston-Lewiston, Sarnia-Port Huron and Windsor-Detroit, which combined handle 60 percent of Canada-U.S. trade and represent the busiest trade gateway in the world
- Canada's two national railways, Canadian Pacific (CP) and Canadian National Railway (CN) operate within Hamilton, providing complete rail freight services across North America.

Goods movement was identified as a policy subject area in the 2007 TMP and is also identified as a key industry sector in the EDAP.

The revised goods movement policy developed for the TMP review and update includes a state of the practice review, a review and update

of supporting actions, a high-level review of the goods movement network, and consideration for the integration of goods movement and Complete-Livable-Better (CLB) streets. In general, the review recommended that the 2007 policies be maintained and that several additional policies be added.

During the TMP review and update development, the dichotomy between small businesses and large employers were noted. Each represents important contributions to Hamilton's economy and each have their issues related to the movement of goods. To gain a better understanding of these issues, goods movement stakeholders and representatives from Hamilton's 13 Business Improvement Areas (BIAs) were engaged. These stakeholders were given the opportunity to provide feedback about key priorities, challenges and opportunities through stakeholder meetings and online surveys. Further details are provided in the Public Consultation Report and the Goods Movement Paper.

Responses from the Goods Movement stakeholder survey, conducted as part of TMP engagement, include:

- 54% of respondents participate in off-peak delivery times
- When deciding the choice of route, 37% of respondents identified safe and efficient travel time as the most important factor (highest response).
- The current truck route network accommodates 90% of respondents well or good with some issues/gaps.

Responses from the Business Improvement Area (BIA) stakeholder survey:

- 61% of respondents use courier services (e.g., UPS, FedEx, Canada Post, etc) as their primary method to ship/receive goods for the service provided within their BIA. Only 4% of respondents use heavy trucks as their primary method.
- 67% of respondents would support improving/increasing enforcement of truck routes.
- Other solutions that were offered requiring more engagement include off-peak deliveries and restricting the size of vehicles making deliveries

The Goods Movement Study (2005) focuses on ensuring a high quality of service on the highway and corridors that connect intermodal hubs and gateways. Opportunities for improved goods movement and increased intermodal transport must be considered to develop and maintain a healthy relationship between land use, economic prosperity, job creation and quality of life in Hamilton. The TMP review and update supports this direction but is also cognizant that the demands for goods movement are dynamic and change according to market forces. Changes in the volume and nature (origin/destination and mode) of goods movement are driven by four key factors as illustrated in Figure 6.3.

In recognition of these key drivers of change, a review of the 2005 Goods Movement Study is necessary. This is identified in both the EDAP and the TMP review and update. In support of this, a review of the 2010 Truck Route Master Plan is also identified as one

method of goods movement that supports economic development.

WHAT WE HEARD



Provide for truck movements in rural areas and connectivity between inter-modal hubs and the highway system. This concern will be considered as part of the Truck Route Master Plan review and update.

The sustainability of all modes of travel, including goods movement, is identified as a key direction for the TMP review and update (as discussed in Chapter 3). Examples of sustainability in goods movement include increasing the efficiency of deliveries through improvements to logistics, supply chain processes and routing, more fuel efficient vehicles, and deliveries made by alternative modes of travel.

Emerging technologies also present potential challenges and opportunities for goods movement. For example, new local delivery systems present an opportunity to improve the efficiency and perhaps speed of goods movement to offset the impacts of delivery vehicles on local streets. One example of this has been established by *InPost* as illustrated in Figure 6.4.

The future of small parcel delivery systems using alternative modes is also being tested worldwide, including in some rural area of Canada. The use of drone and autonomous delivery systems present policy, regulatory, and infrastructure challenges and opportunities. As technology evolves, it is important to be at the forefront

FIGURE 6.3
Key Drivers
of Change
in Goods
Movement¹⁹

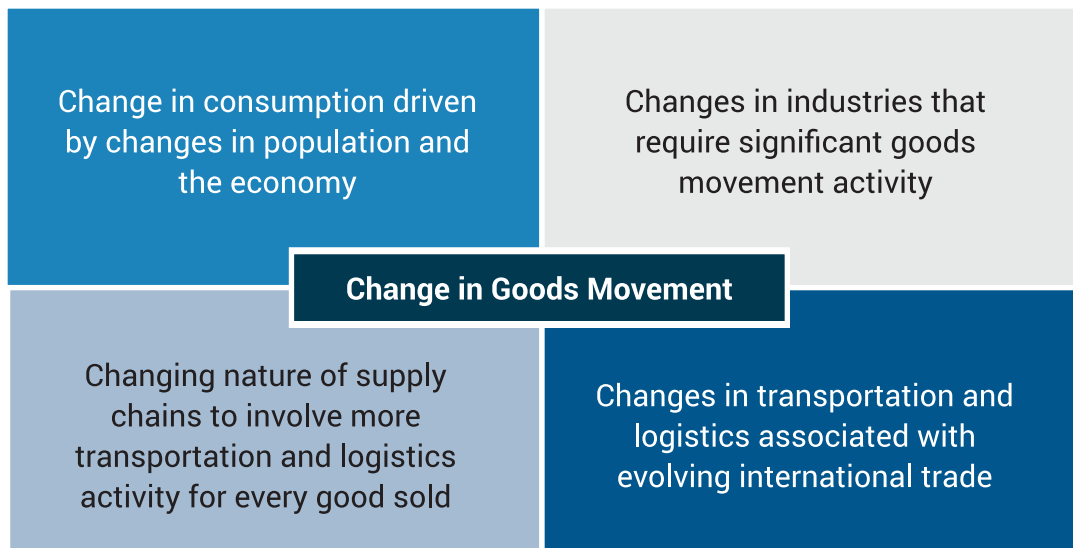


FIGURE 6.4
New Local
Delivery
Systems
(Main Street
East and
Ottawa Street
South)



and lead in these changes and potential disruptions to maximize the benefits of technology, while minimizing any potential negative impacts to the community.

Facilitating continuous improvement through the use of big data, which will help to improve the understanding of origin and destinations of trips and the routes taken and improve the City's ability to identify opportunities and address concerns in the future. The use of GPS traces presents an opportunity for goods movement planning, especially truck route planning. Data collected by commercial fleet management

systems that use in-vehicle GPS units to trace truck itineraries can show the most used routes as well as the use of non-compliant routes. For example, this concept was used in the Region of Peel.

WHAT WE HEARD



Difficulty in balancing the goods movement needs of business stakeholders. It is recognized that this will be an ongoing challenge to work on various appropriate solutions

Key recommended goods movement actions that support economic growth and prosperity are summarized in Table 6.2.

¹⁹Adapted from the Metrolinx Urban Goods Movement Report (2016)

6.2.5 Other Applicable Policies

There are several other policy subject areas related to Economic Growth and Prosperity, including:

- Complete-Livable-Better Streets
- Transit
- Sustainable Mobility
- Emerging Technology
- Access Management
- Parking

6.3 SUMMARY OF KEY ACTIONS

Several policy areas support economic prosperity and growth. These areas as well as the associated key recommended actions are presented in Table 6.2.

TABLE 6.2 Summary of Actions

Policy Theme	No	Actions	Timing	Lead (Partners)
Land Use and Travel Patterns	57	Update the Transportation Impact Study Guidelines to include the concept of multi-modal level of service (MMLoS) which allows for the evaluation of LOS for pedestrian, cycling, transit and goods movement LOS, in addition to traditional auto LOS. MMLoS is one tool to inform trade-offs between modes.	Short	PED
	58	Update Road Right-of-Way policies within the Official Plan to ensure that future development protects for future multi-modal capacity needs, municipal services and utilities, while adhering to the principles of CLB streets and Vision Zero.	Short	PED (PW)
Parking	59	Undertake a city-wide Parking Master Plan, which will develop short-, medium- and long-term plans for the parking system, including both off-street and on-street parking. The Parking Master Plan will inform future updates of the zoning by-law governing the provision of parking for new development.	Short	PED
	60	Integrate the requirement to provide electric vehicle (EV) charging stations as part of future zoning by-law amendments.	Short	PED
	61	Expand existing EV charging and parking stations to create a network within all municipally-owned facilities, including public parking lots.	Ongoing	PED (PW)

TABLE 6.2 Summary of Actions

Policy Theme	No	Actions	Timing	Lead (Partners)
Parking	62	Adopt off-street and on-street parking policies and designs that ensure an adequate parking supply to support growth and economic development, contribute to the achievement of the mode share targets of the TMP, and implement the CLB streets and Vision Zero objectives of the TMP.	Ongoing	PED
	63	Evolve the Hamilton Municipal Parking System to support the increasing use of shared mobility such as carshare and other shared mobility options and, where applicable, park and ride.	Long	PED
Economic Development	64	Provide multi-modal access to/from and within employment lands.	Ongoing	PW/PED
Goods Movement	65	Undertake an integrated review and update of the 2010 Truck Route Master Plan and 2005 Goods Movement Study.	Short	PED (PW)

To ensure that the TMP update is successful, the implementation strategies will establish priorities and target areas of improvement for the highest impact.



Chapter 7

Implementation Strategies and Recommendations

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Chapter 7

Implementation Strategies and Recommendations

As a strategic policy document, the TMP review and update provides the framework (or lens) through which future projects should be viewed under. Therefore, it influences the following:

- Scope of projects
- Priority setting
- Implementation strategies
- Transparency and accountability
- Continuous improvement (performance measurement)

This chapter focuses on approaches to priority setting and implementation. More specifically, strategies to facilitate the implementation of the actions identified in the TMP review and update are described. Recommendations

regarding policies, programs, studies, initiatives and infrastructure projects are also included in this chapter.

The recommendations identified throughout the TMP review and update align with the City's Strategic Plan and enable the achievement of the desired outcomes of a sustainable and balanced transportation system, healthy and safe communities, and economic prosperity and growth.

7.1 IMPLEMENTATION STRATEGIES

Several strategies for implementing the actions from the TMP review and update are provided in the following sections. In some instances a single approach is best, while in other instances an approach that combines more than one implementation strategy may be most effective.

Council has the challenge of balancing many competing capital and operating budget requests annually in striving to reach the City's strategic vision. It is important to

provide Council and City staff with a framework to assist in decision-making relating to the transportation system.

7.1.1 Establishing Priorities

Before a project or program is implemented, the process of prioritization must take place. The TMP review and update should direct future capital budget submissions (which could also affect operating budget submissions) and scoping of individual projects. Recommendations of the TMP review and update are categorized into short- (by 2022) medium- (by 2031), and long-term (2032 and beyond) timeframes. This is based on alignment with the three desired outcomes of the TMP review and update.

The infrastructure projects described in Appendix A were identified as part of previously approved sub-area transportation master plans, secondary plans, studies, Asset Management Program, and other related documents and programs. As part of these studies, a recommended project timeframe was already identified. Some of these projects are already in progress or have been identified as part of the capital budget, in which case a “short” timeframe is indicated. For projects with a timeframe of 2020 or later the categorization based on the three desired outcomes of the TMP review and update should be used to confirm or update prioritization.

These prioritization criteria are based on information available at the time of this study. If there are any significant changes to the key assumptions (e.g., changes to strategic directions,

population and job growth projections, availability of funding) the recommended prioritization criteria may need to be reviewed and updated.

At a more detailed level of the implementation process, inclusion of meaningful public engagement that elicits and reflects the priorities of citizens and other stakeholder groups should be undertaken. This strategic priority will always be part of the implementation process and may change the scope or direction on a project-by-project basis.

7.1.2 Partnerships

Implementation requires partnerships. They are an integral part of delivering transportation services. Opportunities to work with partners can be a valuable part of the transportation service delivery model. Implementation can involve a combination of one or more partnerships. Some examples of existing partnerships are listed below:

- **Intergovernmental relations:** Planning and building the B-Line LRT in partnership with Metrolinx and Infrastructure Ontario.
- **Non-governmental and community organizations:** Sustainable Mobility Programs delivers several programs using non-profit partners (e.g., Cycle Hamilton supports the delivery of Bike Month).
- **Post-secondary institutions:** Students and staff from McMaster University and Mohawk College have contributed to transportation research projects.



Community
Engagement
&
Participation

- **Elementary and secondary schools:** City's ASST Program is a partnership between the City of Hamilton and the two local school boards, as well as staff, parents and students at participating schools.
- **Private sector organizations:** Over 20+ local employers are part of the Smart Commute Hamilton program. Public-private partnerships can also be considered in the delivery of transportation infrastructure and services, such as the public bike share system in Hamilton. Other examples include advertising and sponsorships for transportation-related programs and infrastructure (e.g. plantings within traffic islands and traffic calming treatments).
- **Inter-departmental/divisional:** Through the process of continuous improvement, streamlining internal processes will help to ensure high quality public works are delivered in an efficient and effective manner.

Initiatives such as the Sustainable Mobility Program rely on strong community partnerships to implement travel demand management strategies. The strength and success of these partnerships and programs is seen through the shifting of travel modes to more sustainable forms (i.e., demand), therefore reducing the need for more costly capital expenditures (i.e., supply).

Annually the Transportation Forum brings together many of the partners who deliver transportation programs in the City to develop a community action plan.

Hamilton's Smart Commute Program includes (2016 data):

- **23 workplaces**
- **92,000+ Commuters**

Intergovernmental relations are also important for transportation projects. For example, improving mobility options for citizens by advocating for improvements to the QEW and Highway 403 will help to facilitate longer distance travel and efficient goods movement. This also applies to advocating for all-day two-way GO train service connecting to the Harbour West, Hamilton GO Centre (Hunter Street) and Confederation mobility hubs. Without these provincial network improvements, any system efficiencies gained in association with the LINC and RHVP improvements and the development of the BLAST higher-order transit network is at risk.

7.1.3 State-of-Readiness

Hamilton should be proactive and prepared by being in a "state-of-readiness" for transportation projects and initiatives. This applies to all projects that already have allocated funding or are considered to be priority projects that the City could expect partial or complete external funding. Leveraging our readiness to maximize the benefits of available funding sources from the Province (e.g., Metrolinx, MTO), the Federal Government (e.g., Infrastructure Canada Infrastructure Bank), and other sources, Association of Municipalities of

Ontario, and Federation of Canadian Municipalities) is also part of this approach.

One of the key directions identified in the TMP review and update is to prioritize all projects that are candidates for receiving provincial or federal funding. This will help to identify the current “state-of-readiness” of the City and will identify gaps and the critical-path to improve the readiness for future funding opportunities.

Potential funding sources should also be identified as part of this process in order to better understand the potential application and implementation requirements (e.g., if the identified funding source is a grant, there may be a specific application deadline, a planning deadline or an implementation deadline to be considered) as well as to identify any prior approvals that may be needed, such as source allocation of matching funds (if applicable).

7.1.4 Revenue Tools

Like most municipalities, Hamilton relies on traditional municipal revenue tools that are regulated by the Municipal Act (2001) including property taxes, fees and charges, investment income, special services/area ratings, cash-in-lieu, sponsorship programs, local improvement charges and development charges. With the exception of the City of Toronto, Ontario municipalities do not have other revenue tools available to them. In order to become a fiscally sustainable municipality, it is essential to have a diverse array of revenue tools to ensure that funding remains stable in the long-term. As

green technology becomes more popular and affordable the risk of losing fuel revenue becomes more imminent. Therefore the need for sustainable revenue sources becomes even more critical.

The TMP review and update identifies how this strategic policy document can align with the municipal budget and asset management plan. Part of this alignment is to identify other available revenue tools for further investigation to lobby the Provincial government to permit Hamilton for its use. These tools, in addition to the strategic priority to shift the tax burden away from the residential tax base will help the City to become more financially sustainable.

The range of available revenue tools to pay for local transportation is already well-defined from decades of GTHA, provincial, national and international practices. The 2013 Metrolinx Investment Strategy, detailed in the report entitled *Investing in Our Region, Investing in Our Future*, for example, conducted a global review of potential dedicated revenue tools for transit and transportation projects across the GTHA. Revenue tools identified in the Metrolinx study that can be used as a starting point for discussion include:

- Car Rental Fee
- Carbon Tax
- Cordon Charge
- Corporate Income Tax
- Development Charges
- Employer Payroll Tax
- Fare Increases
- Fuel Tax
- High Occupancy Tolls

- Highway Tolls
- Hotel and Accommodation Levy
- Land Transfer Tax
- Land Value Capture
- New Vehicle Sales Tax
- Parking Sales Tax
- Parking Space Levy
- Sales Tax
- Utility Levy
- Vehicle-KM Travelled Fee
- Vehicle Registration Fee
- Tax Increment Finance (Special Assessment District)

A revenue tools study will help to understand the tools that may be more accessible and practical than others to fund transportation projects in Hamilton. This proposed study is intended to support future inter-governmental relations and discussions regarding financial sustainability. Revenue tool evaluation criteria could include but is not limited to:

- Total estimated revenue intake over the life of the tool
- Robustness and resiliency of the estimated revenues: to grow with economic, population and travel demand growth – and withstand potential changes such as economic downturns, the advent of disruptive transportation technologies and rise of shared personal mobility options
- Ability of the tool to motivate rational modal choice and time of day travel decisions
- Equity and fairness impacts on, and mitigation strategies for, the economically vulnerable segments of our population and community

- The capital operating and administrative costs of implementing and maintaining the revenue collection scheme (net of total gross revenues)
- Seamlessness or inconvenience of the revenue collection scheme from the standpoint of the customer or user
- Enforcement risks and measures to minimize potential revenue loss
- Requirement for, and likelihood, of provincial legislative approval
- Successful track record of implementing a similar tool, and lessons learned, from other comparable jurisdictions
- Identification of any powers or other considerations that would need to be in place in order to apply the tool

7.2 RECOMMENDATIONS

Recommendations regarding policies, programs, studies, initiatives and infrastructure improvements are identified within this section.

7.2.1 Policy Recommendations

As part of the TMP review and update, the transportation policies and supporting actions identified in the 2007 TMP were reviewed in detail, and updated as necessary. Twenty-five policy theme areas were identified, containing over 100 policies and supporting actions. Some of these policies and approaches have been identified and discussed within this document. These policies form the lens that future transportation initiatives should be viewed through (e.g., CLB streets, emerging technology and road safety).

7.2.2 Program Recommendations

7.2.2.1 Asset Management Program

The transportation system covers a broad spectrum of asset categories, as shown in Table 7.1. Accountability for the planning, design, construction, operation, maintenance, rehabilitation and replacement for each asset needs to be clear to ensure that proper stewardship of the whole system is provided.

The City has more than \$6 billion in roads and bridges assets in its care²⁰ and the state of those assets was rated at a C and trending down in 2016. The annual capital block funding provided for roadway asset investment of \$43M (2017) is unlikely to reverse the downward trend in the state of roads and bridges assets. Hamilton is not the only municipality faced with this challenge.

Aging infrastructure and underinvestment presents a risk to public infrastructure in the future. The City provides stewardship of transportation assets based on a framework that uses 10 service goals that have been aligned with the three desired outcomes of the transportation system. Table 7.2 shows the asset management framework in relation to the TMP review and update.

Every time there is a major event or shift in transportation direction, there should be a review to identify any impacts to the assignment of responsibilities and accountabilities and the proper re-assignment or restructuring of resources.

Many of the policies identified with the TMP review and update will impact the scope of work relating to how public works are delivered. For example, the policies relating to CLB streets, call for a collaborative and comprehensive approach to project scoping and creating budgets for projects, rather than limiting scopes due to budget constraints. This is a difficult task, and the decision-making process needs to be transparent and communicated relating to balancing the system and any trade-offs that are required to achieve this balance.

A clear and comprehensive methodology describes asset delivery processes from the definition of the asset need to the time the asset is retired. This type of methodology helps to stabilize and manage business processes and simplify the assignment of responsibilities across the organization as changes occur. There are a number of existing methods and standards in place in Hamilton that could be combined to provide a comprehensive life-cycle guide to asset planning, delivery and management as part of the continuous improvement process. Figure 7.1 shows an example of a comprehensive asset planning and delivery framework.



Our People & Performance

²⁰City of Hamilton 2016 State of the Infrastructure Report and Assets Report Card - Public Works

TABLE 7.1
Transportation
Related Assets

Transportation Asset Category	Example Types
Linear roadway	Gravel roads, alleyways, laneways, paved roads, boulevards, maintenance strips, curbs, paved shoulders, medians, ditches, retaining walls, pavement markings, on/off ramps
Roadway safety	Roundabouts, mini-roundabouts, right-turn channels, narrowings, raised intersections, speed humps, bollards, cats eyes, rumble strips, high-friction asphalt, guide rails, railway crossings
Pedestrian	Pathways, sidewalks, fences, stairs/ramps, railings, cross-walks, multi-use recreational trails, pedestrian crossings and supporting amenities
Cycling	Cycle tracks, cycling lanes, bike paths, bike wheel ramp, stairs with bike troughs
Community and environmental	Bio-swales, stormwater ponds, street furniture, parking and loading bays, trees and grates
Traffic control	Traffic signals, street lights, Traffic Management Centre, signs, and various parking meter types
Transit	Bus bays, transit stops including signs, landing pads, benches and shelters, transit terminals, park and ride facilities and buses
Structural	Bridges, tunnels, retaining walls and culverts
Facility	Building facilities such as offices, and maintenance and storage facilities/yards

TABLE 7.2
Asset
Management
Service
Framework

Desired Transportation System Outcomes	Asset Service Goal	Asset Service Level Definition
Sustainable and Balanced Transportation System	Sufficient Quality/Quantity	Services are delivered to acceptable quality and quantity
	Uninterrupted Service	Service is reliable and subject to infrequent interruption
	Accurate	Customer response is accurate and based on correct information
	Responsive	Customer issues are captured and acted upon in an efficient and timely manner
	Environment	Services meet environmental requirements, as regulated by legislation and/or operating licenses or agreements
Healthy and Safe Communities	Safety	Services meet safety requirements, as regulated by legislation and/or operating licenses or agreements
	Protect the Public	Services delivered and/or supporting infrastructure, do not pose undue risk to public safety
	Keep Employees Safe	Employees are safe in doing their jobs
Economic Prosperity and Growth	Affordable	Costs are minimized and distributed such that access to service does not cause undue hardship to customers, businesses or the public.
	Accommodate Growth	Growth and development is not hampered by the availability of service capacity (within current plan)

FIGURE 7.1
Example
Asset
Planning
and Delivery
Framework



7.2.2.2 Strategic Road Safety Program

With the intent to improve road safety for all roadway users over the short, medium and long term, several initiatives such as the HSRSP, PMP and Cycling Master Plan implementation are designed as long-term strategies for improved safety and mobility in the city. Other strategies that support road safety and mobility in Hamilton includes the Traffic Calming measures, CLB streets and Vision Zero. The intent of these strategies is to embed these principles and approaches into planning communities and designing roadways. Over the long-

term these will decrease the need to “retrofit” neighbourhoods and arterial roadways.

Funding for roadway safety projects is financed in part by the RLC Reserve fund. The program is an example of a sustainable transportation program with financial sustainability. Excess RLC Program fine revenue not required to build, operate or maintain existing or future RLC sites are allocated to road safety initiatives, as supported by the Hamilton Strategic Road Safety Program, subject to maintaining a minimum balance of \$100,000 in the RLC Reserve.

7.2.2.3 Sustainable Mobility Program

Since its inception in 2009, the implementation of the Sustainable Mobility Program has successfully delivered many projects and programs. It has contributed to reducing or delaying the need for additional roads, and has contributed to healthier outcomes through successful increased physical activity.

The staffing resources and funding for this program was set out in 2007 when Sustainable Mobility was in its infancy. Since that time, the program has grown significantly and is currently at full capacity. In order to make progress on achieving the aspirational modal split targets, the program needs to be further developed. Accordingly, additional resources are recommended for future consideration. A portion of this program (Smart Commute Hamilton) is currently cost-shared between the City and Metrolinx.

7.2.2.4 Traffic Operations Program

Finding efficiencies within the existing transportation system through various localized improvements will eliminate or defer the timing of costly road expansion projects. For example, the ATMS system has the capability to provide real-time traffic data aimed at responding to potential and evolving traffic issues on Hamilton roads. This allows staff to adapt and respond to changing traffic patterns relating to situations such as road closures, collisions, and other incidents in order to maintain safe and efficient use of the roads.

The expansion of this system is expected to require an investment of \$8.6 million between 2018 and 2026. Further investigation into the efficiencies offered by employing other ITS strategies should be undertaken.

7.2.2.5 Transit Program (BLAST Network and Ten Year Local Transit Strategy)

The \$1.0 billion investment made by Metrolinx along the B-line is a first step towards a higher-order network that feeds the broader regional transit system. Continued refinement and investment of the supporting Ten Year Local Transit Strategy to build ridership is an important part of this success. The Federal government and the City have committed to cost-share (50/50) \$72 million over the next two years for a bus maintenance and storage facility. Additional investments in transit terminals, transit reliability through transit priority measures, and stop amenities require continued investment.

7.2.3 Recommended Studies and Initiatives

A number of future studies and initiatives were identified as part of the TMP review and update to investigate issues in further detail. These are identified in Table 7.3

7.2.4 Infrastructure Recommendations

The transportation system infrastructure improvements identified in the TMP review and update have previously been approved as part of sub-area transportation master plans,

TABLE 7.3
Summary of
Recommended
Studies and
Initiatives

Project	Timing	Relevant TMP Outcome
CLB Streets Design Manual (see Action #36)	2019-2022	● ■
Cycling Master Plan Review (see Action #11, 13, 14 and 15)	2023-2031	● ■
EMME model management* (see Action #66)	Ongoing	●
Escarpment Crossing People Mover Study (see Action #43)	Beyond 2031	▲
Goods Movement Study Review/ Update (see Action #65)	2019-2022	▲
Intelligent Transportation System (ITS) Strategy (see Action #48)	2023-2031	● ■ ▲
403 Connections Study (see Action #49)	2019-2022	●
Multi-Modal Level of Service (see Action #38)	2019-2022	●
Pedestrian Mobility Plan Review (see Action #6, 7, 8 and 11)	2023-2031	● ■
Revenue Tools Study (see Action #49, 67-71)	2019-2022	●
TMP Review (see Action #69)	2023-2031	● ■ ▲
Truck Route Master Plan Review* (see Action #65)	2019-2022	● ▲

* Identified within current capital budget

Legend

- Sustainable and Balanced Transportation System
- Healthy and Safe Communities
- ▲ Economic Prosperity and Growth

secondary plans, studies and other related documents. These have been validated as part of the strategic evaluation of system alternatives (Chapter 3). The list of infrastructure recommendations is provided in Appendix A, Identified Projects.

The 2014 Development Charge Background Study identified over \$1 billion of growth-related transportation investment cost estimates to 2031, as identified below. In addition, over \$1 billion in Provincial investments and Federal cost-sharing funding have also been identified.

City Growth-Related Transportation Cost Estimates (to 2031)³⁰:

- Road Investment (\$728M)
- Transit Investment (\$335M)
- Ten Year Local Transit Strategy improvements (unfunded)
- Recreational Trails (\$4.8M)

Provincially Funded Initiatives:

- Transit: B-Line LRT Project (\$1.0B)
- Highway improvements: future investment in Highway 403 improvements. According to the letter received by the City from the Minister of Transportation, improvements (one lane per direction between Main Street West and Jerseyville Road) identified within Phase 1 of the NGTA Corridor Study are within MTO 5-year Southern Highways Program, subject to the undertaking of the necessary EA and approvals. No other specific time frames, project requirements or other details were provided.

Federal (Cost-share) Funding Initiatives:

- Transit: \$72M (50/50 cost share over two years) Bus Maintenance and Storage Facility

7.3 SUMMARY OF KEY ACTIONS

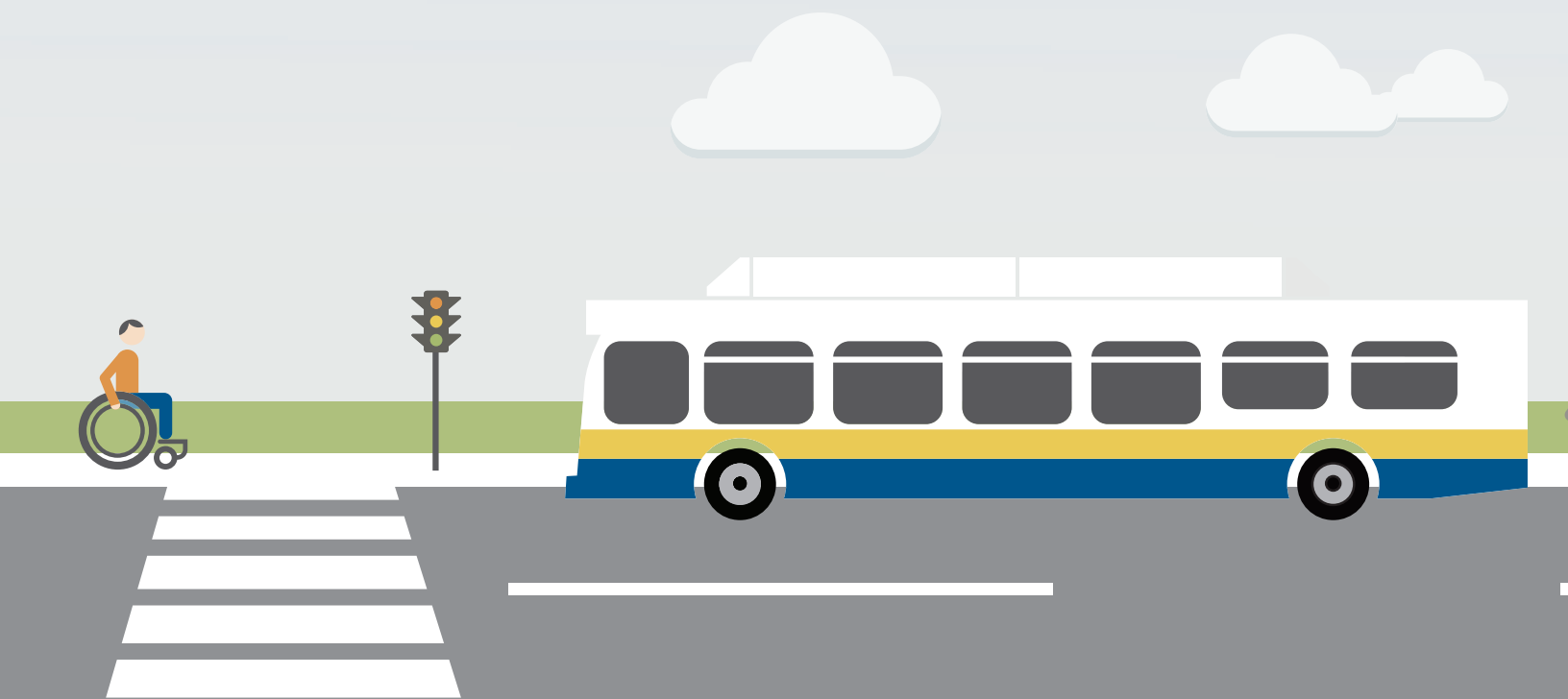
Key recommended actions related to implementation are presented in Table 7.4.

³⁰ 2014 Development Charge Background Study

TABLE 7.4 Summary of Actions

Policy Theme	No	Actions	Timing	Lead (Partners)
Implementation	66	Create in-house transportation modelling and data analysis capacity to support transportation decision and planning needs, and the monitoring of TMP outcomes.	Short	PED
	67	Update the City's travel demand forecast to reflect the updates from the revised Growth Related Integrated Development Strategy (GRIDS).	Short	PED
	68	Implement the proposed monitoring program for the TMP and report to Council on a regular basis.	Ongoing	PED
	69	Conduct regular reviews of the Transportation Master Plan.	Medium	PED
	70	Create project budgets based on designs as opposed to designs based on available budget to provide higher quality infrastructure.	Ongoing	PED/PW
	71	Apply asset management best practices which include consideration of operating and maintenance costs (lifecycle) in the prioritization of infrastructure investments.	Ongoing	Corporate-wide

City in Motion requires regular monitoring in order to meet its targets of success. The following chapter proposes a monitoring framework with clear goals and methods of evaluating Hamilton's progress.



Chapter 8

Monitoring

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Chapter 8

Monitoring

This chapter identifies the process for monitoring and updating the TMP review and update. It also provides a summary of recommendations for continuous improvement of the performance of the overall transportation system, the condition and performance of its assets and the delivery of transportation-related services. Finally, it describes a performance monitoring framework designed to monitor and evaluate the effectiveness of TMP policies and actions and provide the level of transparency required to be accountable to the public.

8.1 TRANSPORTATION MASTER PLAN MONITORING

Generally, master plans should be reviewed every five years to determine the need for a detailed formal review and update. The MEA document identifies the following circumstances may trigger a detailed review:

- Major changes in the original assumptions made in the master plan
- Major changes to components of the master plan
- Significant new regulations (e.g. environmental)
- Major changes in proposed timing of projects within the master plan.

Other major changes that may trigger the need for a detailed review include new health effects, funding opportunities, changes or updates to internal and external guiding documents such as GRIDS, Strategic Plan, Official Plan, the Provincial Growth Plan, and the RTP (Big Move).

8.2 POLICY MONITORING FRAMEWORK

Performance measurement is necessary to gauge the effectiveness of the policies, programs and infrastructure improvements in achieving the TMP vision, goals, targets and recommendations.

A revised performance monitoring framework is provided in Table 8.1, where a brief description about each performance indicator is provided. The table also identifies a proposed target (if applicable), the primary data source, and the Department accountable for collecting and analyzing the data. This framework also identifies the relationship between the transportation performance indicators and the three desired outcomes identified within the TMP review and update.

Collaboration amongst City departments and divisions is required to provide inputs into monitoring. Through collective ownership, this information will help with the continuous improvement process.

TABLE 8.1 Summary of Key Performance Indicators

Sustainable and Balanced Transportation System		
Policy Theme Area	Performance Indicator(s)	Future Signs of Success
Sustainable Mobility	SOV mode share (%)	↓
	Smart Commute Program participation	↑
Active Transportation	Walking/Cycling trips per capita	↑
	Hamilton public bike share system usage	↑
	Kilometers of protected cycling infrastructure	↑
Transit	Transit mode share (%) and trips per capita	↑
	Completion of rapid transit network, BLAST (%)	↑
Roads	Implementation of strategic road network (%)	↑
Climate Change	Corporate and total GHG emissions	↓
Healthy and Safe Communities		
The Role of Health and the Built Environment	Physical activity rates	↑
Road Safety	Road fatalities and serious injuries (number and rate)	↓
Accessibility	Transportation infrastructure compliance with AODA	↑

TABLE 8.1 Summary of Key Performance Indicators

Economic Prosperity & Growth		
Land Use and Travel Patterns	Average journey to work trip distance (km)	↑
Economic Development	Transit service to Employment Lands	↑
Goods Movement	Cargo movements	↑

8.3 ADDITIONAL MONITORING PROGRAMS

Additional monitoring should be done using surveys, before-and-after monitoring studies and forecasting of travel demands using the City's travel demand model (EMME) and other transportation modelling tools. There may also be opportunities to link monitoring programs to other partner agencies such as the MTO.

Supplementary travel surveys and monitoring studies should be developed to assist in measuring infrastructure and program performance. Some of these initiatives should be undertaken to complement TTS during publication years to provide updated commuter patterns throughout Hamilton.

Before-and-after studies, including project pilots, provide an effective means of evaluating the merits of various policies, projects and programs to assist in the continuous improvement of the transportation system and processes. The specific metrics collected and methods used to collect data depend on the nature of the project and program. The City has undertaken a number of these, including the monitoring of the Cannon Street Cycle Track, King Street Transit-only lane, and the 30 km/h speed limit in the North End Neighbourhood. These have helped to inform City staff and Council on what works, what does not work, and how to learn and improve in the future.

Another important component of monitoring is maintaining the City's travel demand model (EMME) that is used to forecast travel demand. This will help to identify existing and future transportation system deficiencies and assess network needs and opportunities. Reallocation of resources

will be required to establish in-house ownership of the model and proactively maintain, manage and update the model more efficiently. This will ensure that the transportation network is accurately updated for continued use without requiring the additional acquisition of external consulting resources. Consideration should also be given to adopting a scenario-based planning and forecasting process that leads to the identification of alternative transportation futures and related probable outcomes for the transportation system.

8.4 SOURCES OF DATA

There are a number of potential sources of data identified to support policy monitoring. The opportunity to use new data sets through big data, as well as collaboration with educational institutions, non-governmental agencies and other community partners provides new avenues to improve the quantity and quality of information. The public is also becoming an important direct source of information. Whether through contribution of data through crowdsourcing (e.g. WAZE) or through feedback received from 905-546-(CITY) or third party "see-click-fix" mobile applications, the experiences and contributions of citizens are valued. Also, the availability of information to the public through the City's open data policy provides opportunities for new insights into data interpretation and use.

Existing City programs and external data sources that provide information are summarized below. This list is not exhaustive and it is anticipated that additional sources will become available in the future.

WHAT WE HEARD FROM STAKEHOLDERS:



Data sharing between stakeholders will enable system reliability (e.g. Compass Freeway Traffic Management System, Waze community based navigation app).

Active Transportation (AT)

Benchmarking Program: The AT Benchmarking program collects pedestrian and cycling (active transportation) activity throughout the City along sidewalks, trails, and on-road bicycle routes. Automatic counters monitor active transportation 24 hours a day at various locations for one-week durations. There are also permanent count locations along on- and off-road routes, with future plans to integrate into the City's Advanced Traffic Management System (ATMS).

Advanced Traffic Management System (ATMS): Hamilton's ATMS system, which is operated from the Traffic Management Centre, has the capability to provide up to date, real time traffic data aimed at responding to potential and evolving traffic issues on Hamilton roads. The system allows city staff to adapt and respond to changing traffic patterns relating to situations such as road closures, collisions, and other incidents in order to maintain safe and efficient use on the roads.

Alternative Transportation Program: The Alternative Transportation Program includes the planning and implementation of alternative transportation infrastructure. In particular, this is related to cycling

infrastructure. As part of this, the program includes planning and implementation of the City's Cycling Master Plan, which is described in more detail in the Cycling Master Plan Review and Update.

Asset Management Program: The City of Hamilton owns, operates and maintains over \$14.4 billion (replacement value) in core capital infrastructure. The City's Asset Management Program monitors current levels of service, life cycle trends and deterioration models. An infrastructure "report card" on Public Works assets is also produced as part of the Ontario Municipal Benchmarking Initiative which is part of a continuous improvement process for the management of the City's infrastructure.

Canadian Community Health Survey (CCHS): The CCHS provides and collects health-related data at the sub-provincial levels of geography (health region or combined health regions). The primary use of the CCHS data is for health surveillance and population health research. It is designed to provide reliable estimates at the health region level every 2 years.

Hamilton Air Monitoring Network (HAMN): For many years the Ministry of the Environment and Climate Change (MOECC) and Environment Canada (EC) carried out ambient and point source air quality monitoring in the Hamilton area. Since 2003, the point source air quality monitoring network in Hamilton has been operated, serviced and maintained by the HAMN. Real-time data is available on the HAMN website.

Hamilton Strategic Road Safety Program (HSRSP): The vision and mission of the HSRSP is to make roadways throughout the City of Hamilton the safest throughout North America and to address safety for ALL road users, including vulnerable road users such as seniors and children and to reinvest RLC revenue into safety initiatives in the Community. As part of this program, a significant amount of data is collected and analyzed including collision data.

Participation and Activity Limitation Survey: A national survey designed to collect information on adults and children who have a disability, that is, whose everyday activities are limited because of a condition or health problem.

SoBi Hamilton Data: Hamilton's bike share program presents a unique opportunity for more diverse data collection. The system's GPS technology continually tracks the location of each bike geographically, providing information about system usage, routes selected, and more.

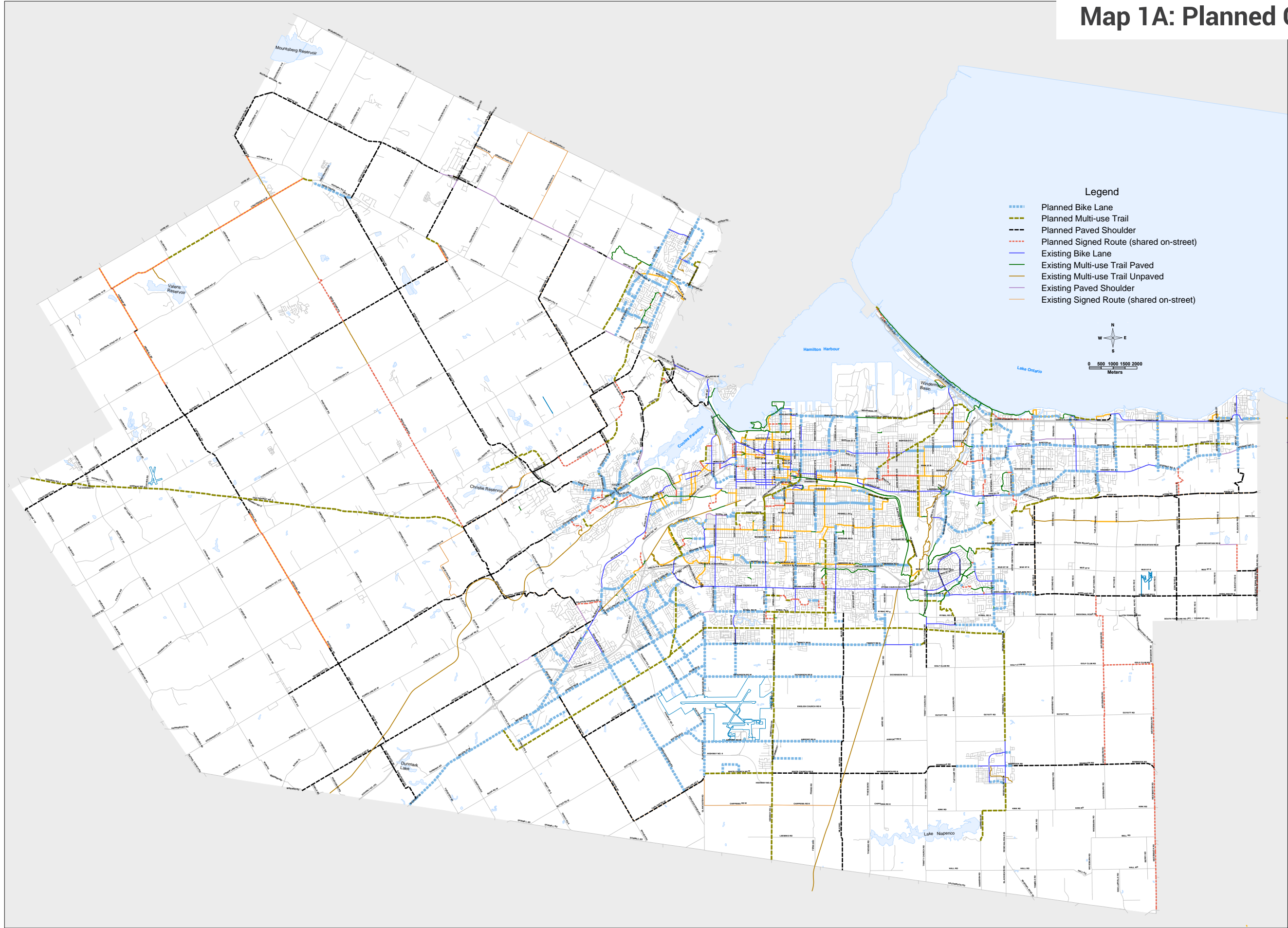
Statistics Canada Census Data: The Statistics Canada Census Program provides a statistical portrait of the country every five years. A wide array of data is collected, including population and dwelling counts, age and sex data, families and households data, income information, education, journey-to-work, mobility and

migration, and much more. Data are available at the country, province, and local census tract levels.

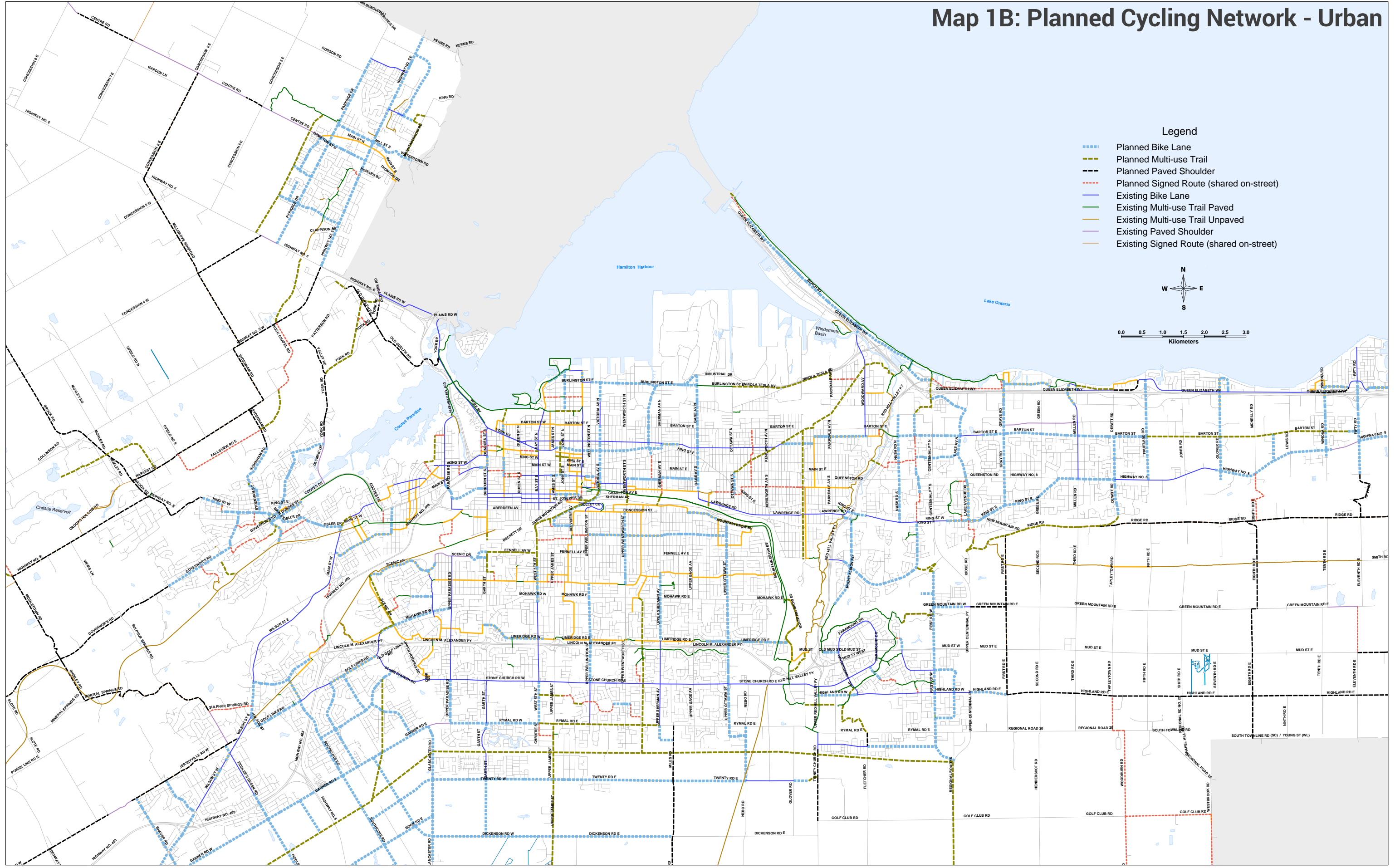
Sustainable Mobility Program: The City's Sustainable Mobility Program mandate is to reduce SOV travel in Hamilton, through behaviour change towards more sustainable modes of travel. This program includes many programs and projects, many of which involve the collection of metrics and information. This is especially true for the Smart Commute Hamilton Workplace Program, the ASST Program, and the bike share (SoBi) program. Further details are provided in the Sustainable Mobility Program Review Background Report.

Transportation Tomorrow Survey (TTS): TTS is a regional data sharing effort with the intent of mapping and monitoring the movement of people through Southern Ontario. It includes monitoring and cataloguing the origin/destination, mode of travel and various other characteristics of movement Ontarians undertake as they move through the region. Municipalities use data from the TTS to gain a better understanding of travel patterns. It also allows them to monitor these patterns temporally. Using TTS allows municipalities to monitor their modal split providing goals for multimodal diversification and identify route flow in support of target improvement.

Map 1A: Planned Cycling Network

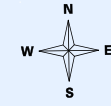


Map 1B: Planned Cycling Network - Urban



Legend

- Planned Bike Lane
- Planned Multi-use Trail
- Planned Paved Shoulder
- Planned Signed Route (shared on-street)
- Existing Bike Lane
- Existing Multi-use Trail Paved
- Existing Multi-use Trail Unpaved
- Existing Paved Shoulder
- Existing Signed Route (shared on-street)

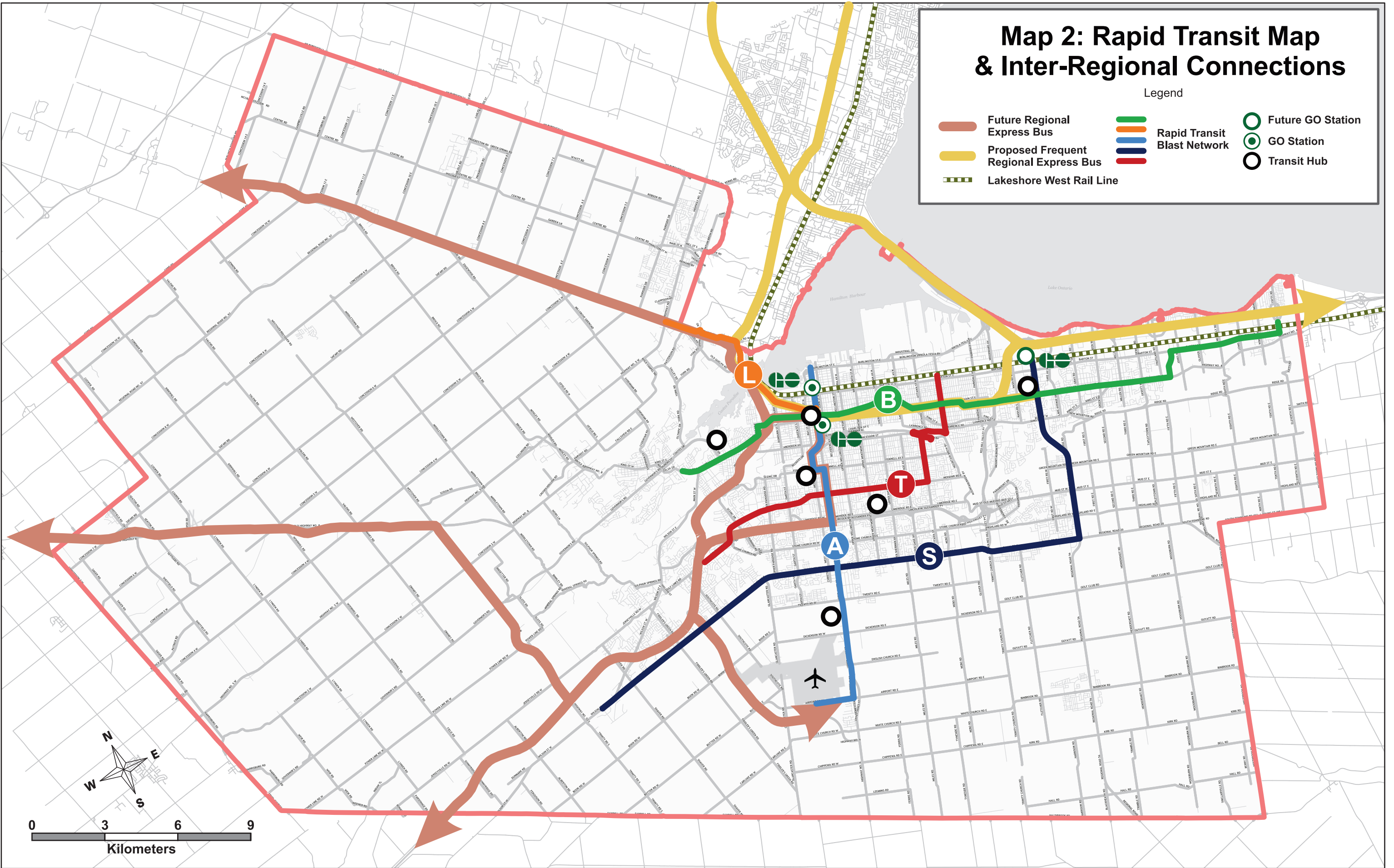


0.0 0.5 1.0 1.5 2.0 2.5 3.0
Kilometers

Map 2: Rapid Transit Map & Inter-Regional Connections

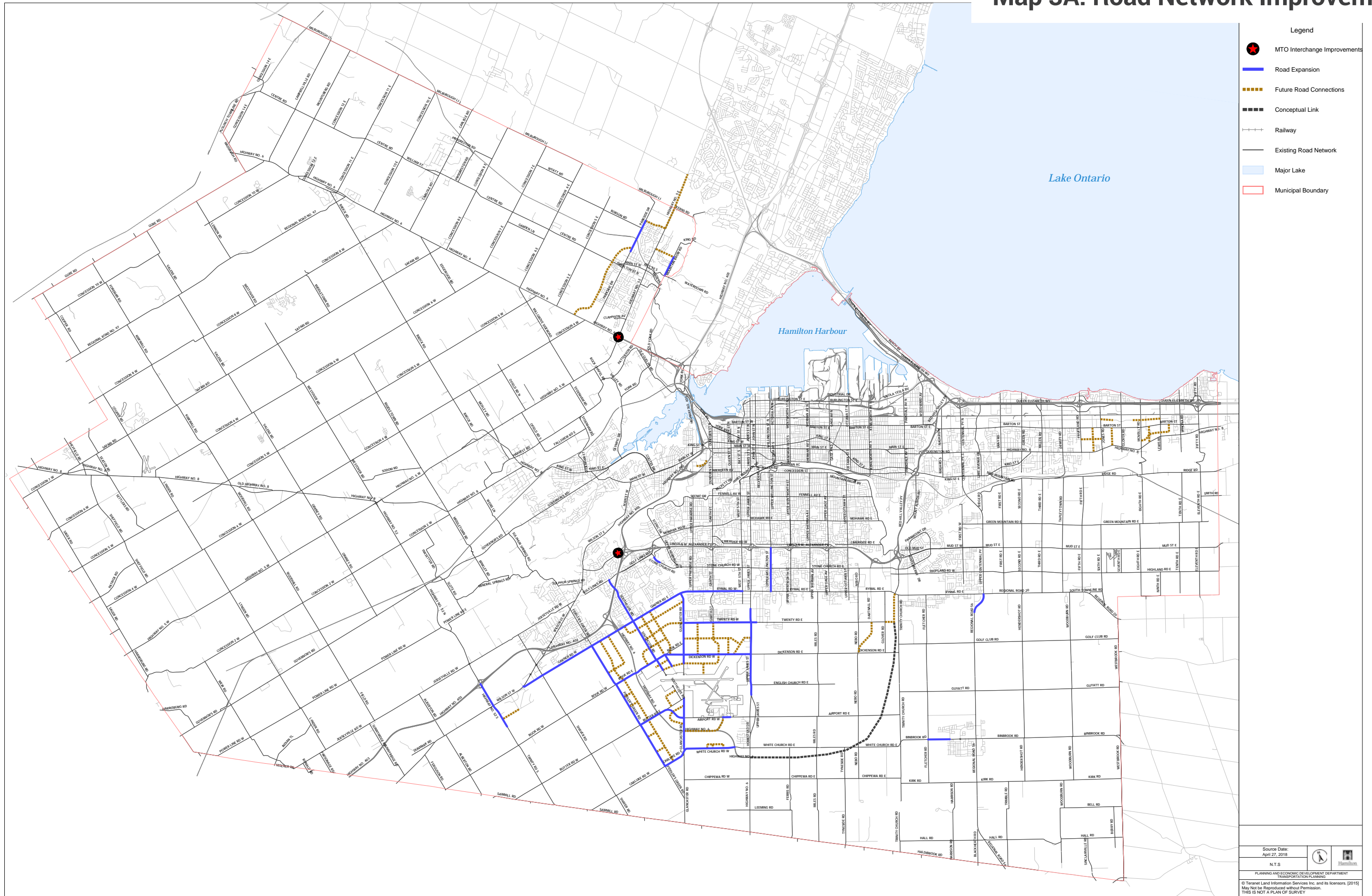
Legend

-  Future Regional Express Bus
-  Proposed Frequent Regional Express Bus
-  Lakeshore West Rail Line
-  Rapid Transit
-  Blast Network
-  Transit Hub
-  Future GO Station
-  GO Station
-  Transit Hub

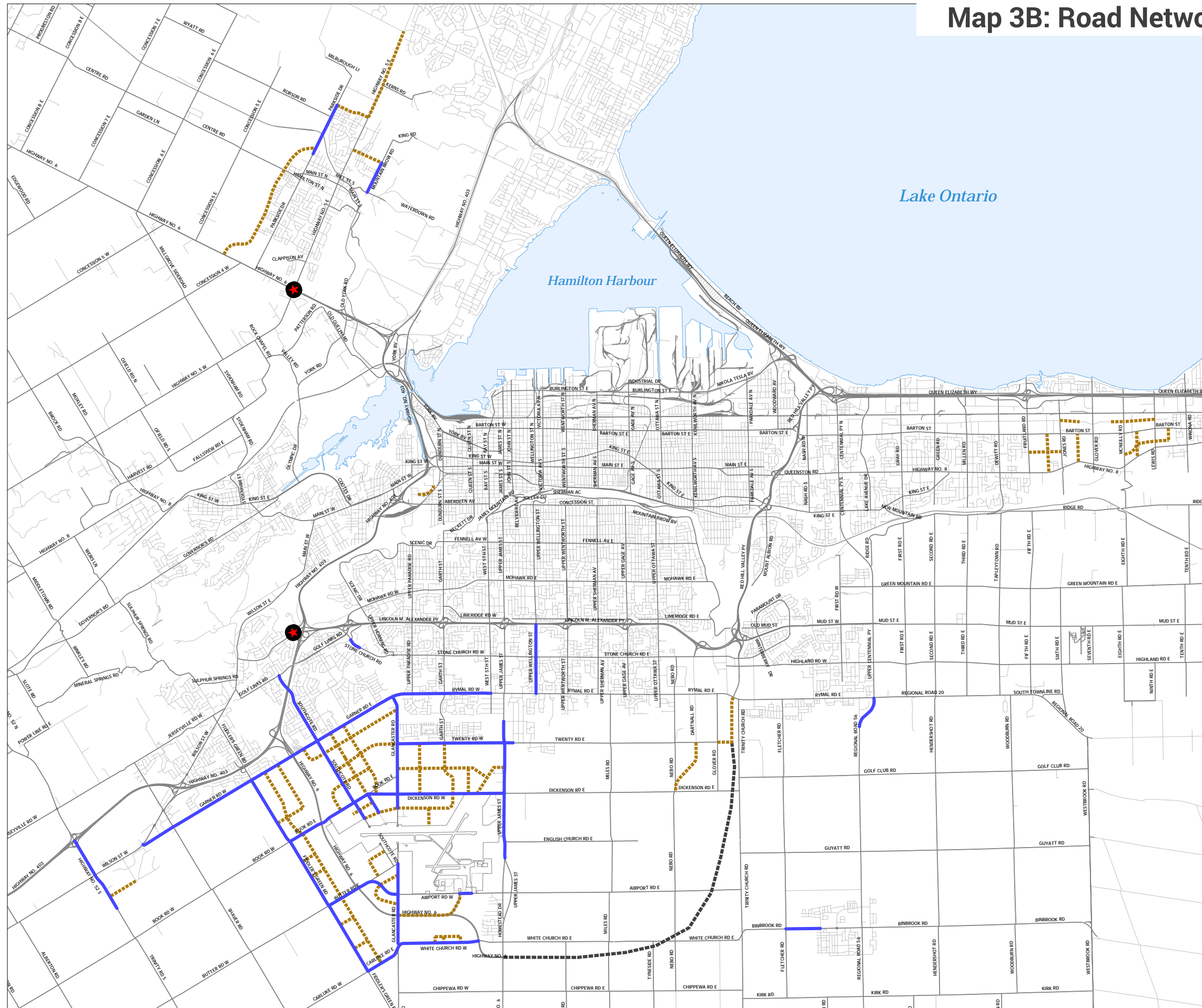


0 3 6 9
Kilometers

Map 3A: Road Network Improvements



Map 3B: Road Network Improvements - Urban






Legend

- MTO Interchange Improvements
- Road Expansion
- Future Road Connections
- Conceptual Link
- Railway
- Existing Road Network
- Major Lake

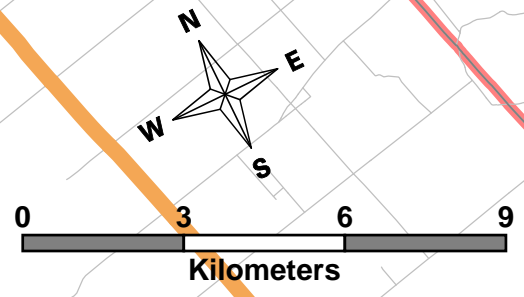
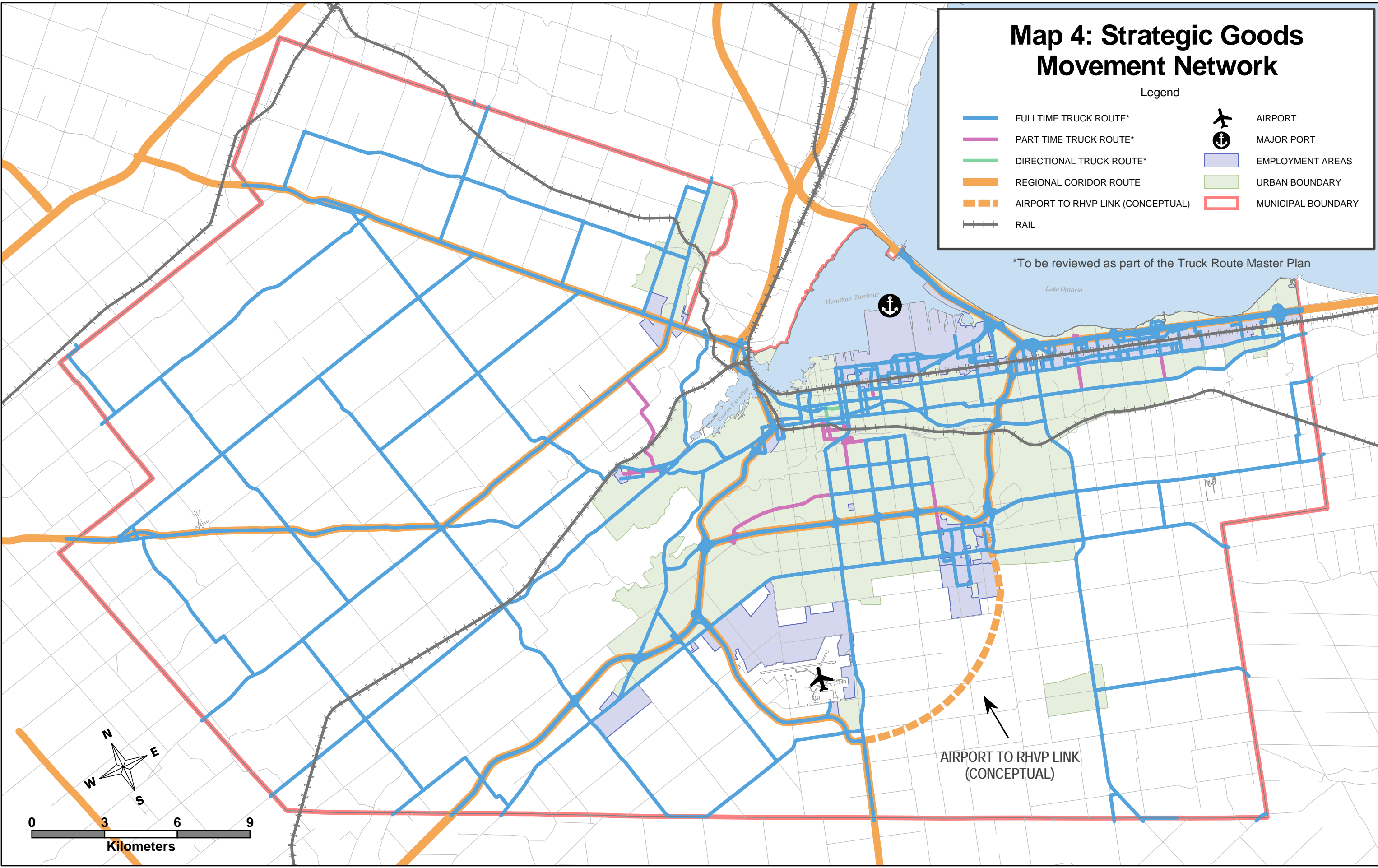
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Map 4: Strategic Goods Movement Network

Legend

- FULLTIME TRUCK ROUTE*
- PART TIME TRUCK ROUTE*
- DIRECTIONAL TRUCK ROUTE*
- REGIONAL CORIDOR ROUTE
- AIRPORT TO RHVP LINK (CONCEPTUAL)
-  RAIL
-  AIRPORT
-  MAJOR PORT
- EMPLOYMENT AREAS
- URBAN BOUNDARY
- MUNICIPAL BOUNDARY

*To be reviewed as part of the Truck Route Master Plan



AIRPORT TO RHVP LINK
(CONCEPTUAL)