



**Background Report:  
Road Safety**



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

## Road Safety Background Paper

### 1.0 Introduction

This background paper discusses road safety within a broad context. The role of road safety contributes to the City's journey to achieve its Strategic Plan and Transportation Master Plan (TMP) review and update visions. This paper informs the policies and supporting actions within the TMP and identifies road safety as an important consideration in all transportation planning, design and operation. The paper will be updated based on the recommendations in the ongoing Vision Zero study when it is complete.

### 1.1 Road Safety is Key to Healthy and Active Communities

Hamilton's Strategic Plan vision is to be the best place to raise a child and age successfully. In terms of strategic priorities, providing safe streets is supportive of a city where people are active, healthy, and have a high quality of life. There are opportunities to make safety an integral part of roadway design, transportation decision-making and encouraging safe and healthy behaviours to have healthier outcomes for citizens.

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).

The vision and mission of Hamilton's Strategic Road Safety Program 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 Red Light Camera (RLC) revenue into safety initiatives in the Community.*

### 1.2 Current Level of Roadway Safety

In some areas with Hamilton, the roadways are becoming busier. Collisions and the risk of collisions are becoming a growing concern for the safety of all road users. On average, there are approximately 3,680 reported collisions each year in Hamilton.<sup>1</sup> The majority of these collisions (approximately 89%) are vehicle-only collisions, whereas approximately 11% of collisions involve vulnerable road users<sup>2</sup>.

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<sup>1</sup> Average over a 5-year period from 2013–2017.

<sup>2</sup> For the purposes of this analysis, vulnerable road users include pedestrians and cyclists.

Not only are fatalities and severe injuries on the road unacceptable from an ethical perspective, they are also unacceptable from a societal cost perspective. A survey administered as part of Hamilton’s Vision Zero initiative found that more than 90% of survey respondents agree or strongly agree that Hamilton’s roads could be safer.

### 1.3 Road Safety Initiatives

In 2000, the Red Light Camera Program was established with the intention of improving road safety by reducing incidents of angle collisions at traffic signals. Net revenue from red light tickets is used to fund other safety initiatives. This funding source has enabled the City to address many aspects of road safety through various programs and policies. Table 1 provides several examples of the City’s road safety-related programs initiated since 2000 (this is not an exhaustive list of initiatives).

**Table 1: Examples of Hamilton’s Safety Initiatives since 2000**

2000 to 2010	2011 to 2018
Network Screening Program (2000)	Ladder Crosswalk Program (2013)
Active & Sustainable School Transportation (2000)	Hamilton Helmet Initiative (2013)
Red Light Camera Program (2000)	Pedestrian Mobility Plan (2013)
Collision Counter Measure Program (2004)	Hamilton Strategic Road Safety Program – safety of all road users, including vulnerable users (2014)
Hamilton Strategic Road Safety Program (2007)	School Zone Safety Program (2014)
	Dynamic Radar Feedback Sign Program (2014)
	Hamilton Strategic Road Safety Program – reducing default speed limit (2015)
	New Permanent Traffic Calming Program (2016)
	Distracted Driving Campaign (2016)
	Slow Down, Safety Zone Program (2016)
	Pedestrian Crossover Program (Bill 31) (2016-present)
	Vision Zero feasibility exploration
	Automated Speed Enforcement
	Speed Kills Traffic Safety Campaign and Road Safety Pledge (2018)
	Annual Collision Safety Report
	Emergency detour route (EDR) sign installations

Despite these successes, the City recognized that more needed to be done and in January 2016 directed City staff to undertake a comprehensive plan that further improves road safety in Hamilton. Part of this direction was to examine the internationally renowned Vision Zero approach to road safety.

## 2.0 Vision Zero

Road safety is an important component of the TMP review and update. A balanced and sustainable transportation system provides for safety in all mobility choices, integrates safety into CLB street design and ensures the movement of people and goods for economic growth and prosperity happens in a safe manner. Hamilton's is aligned with Transport Canada's Road Safety Strategy 2025 and the Ministry of Transportation of Ontario Vision. These road safety initiatives incorporate the continuous improvement philosophy.

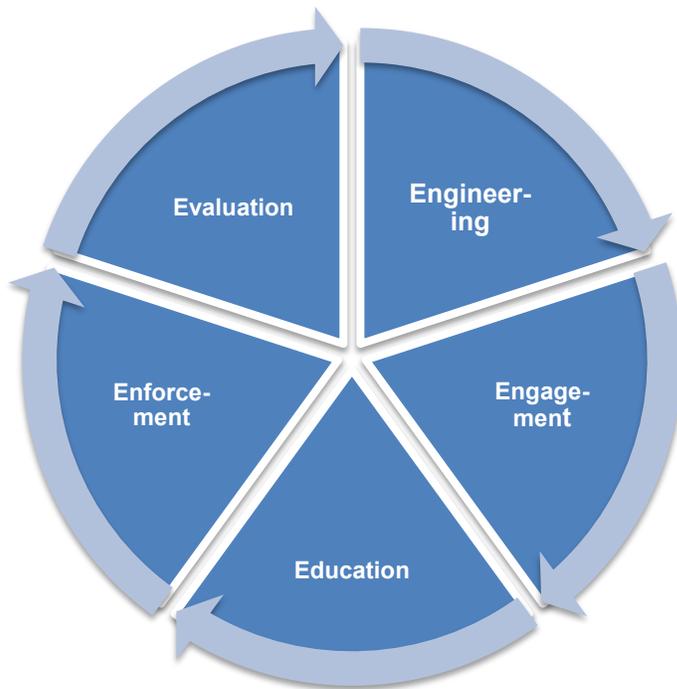
Vision Zero is a proactive approach to road safety, with the simple and clear goal of zero fatalities or serious injuries on roadways. An important element of Vision Zero is that road safety takes precedence over operations and convenience. Vision Zero focuses on:

- 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

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 of all ages and abilities, while reducing contributions to climate change and encouraging a healthy lifestyle.

Vision Zero aims for safer streets by addressing traffic safety holistically through five main elements: education, enforcement, engineering, evaluation and engagement (Figure 1). No single element on its own will result in success. Rather, the combination of several elements (or all of them) greatly improves the potential for positive results. Many cities around the world have adopted or are considering the Vision Zero approach. Currently, Hamilton is exploring Vision Zero to determine the feasibility of implementing this approach on Hamilton's roadways.

**Figure 1: Elements of Vision Zero**



## 2.1 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 approach to designing, constructing and operating neighborhood roadways and features to ensure safe vehicular traffic movement. Techniques to reduce the impacts of traffic on neighbourhood communities and other public facilities such as parks, school areas, and community centres can include speed humps, curb extensions, roundabouts, diverters, partial or full road closures, and various streetscaping elements.

There are many road safety measures available for consideration as part of road design process and to improve upon engineering designs. A Transport Canada report<sup>3</sup> outlines a number of low, medium and high-cost roadway infrastructure measures that can be taken to improve roadway safety, including those identified in Table 2.

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<sup>3</sup> International Road Engineering Safety Countermeasures and their Applications in the Canadian Context. Transport Canada (2009).

**Table 2: Example Roadway Safety Measures identified in *International Road Engineering Safety Countermeasures and their Applications in the Canadian Context* (Transport Canada, 2009)**

Relative Cost	Description of Example Safety Measures
Low-Cost	<ul style="list-style-type: none"> <li>• Splitter islands and overhead stop signs to improve intersection visibility to motorists</li> </ul>
	<ul style="list-style-type: none"> <li>• Advanced green lights, which give pedestrians lead time that enables them to enter the intersection ahead of the vehicles and thereby improving their visibility</li> </ul>
	<ul style="list-style-type: none"> <li>• Yellow bar markings painted across the road at irregular intervals to reduce speed by giving drivers the visual cues that their speed is actually higher than their actual speed.</li> </ul>
Medium-Cost	<ul style="list-style-type: none"> <li>• Gateways that provide visual and/or tactile cues (e.g. longitudinal rumble strips or pavement markings) designed to mark a threshold to a special environment (e.g. school zone) requiring a shift to lower speeds.</li> </ul>
	<ul style="list-style-type: none"> <li>• 2+1 roadway design without cable barriers that alternates the provision of two lanes from one direction to the other.</li> </ul>
High-Cost	<ul style="list-style-type: none"> <li>• Variable speed limit signs that advise drivers that they are traveling too fast for conditions (e.g. icy roads)</li> </ul>
	<ul style="list-style-type: none"> <li>• New Jersey jug handle intersections that redirect left-turning traffic around the intersection, thereby avoiding left turns in front of opposing traffic</li> </ul>
	<ul style="list-style-type: none"> <li>• 2+1 roadway design with cable barriers separating opposite traffic flows that have been used in Sweden.</li> </ul>

## 2.2 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.

## 2.3 Education

Education includes targeted and collaborative campaigns to address safety for all road users. Education and awareness is one of the ways through which the program works to facilitate a measureable shift in travel behaviour. For example, the City and community partners work together to help provide curriculum materials related to active and sustainable travel, and deliver hands-on cycling training 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.

Other current examples of education led by the Hamilton Strategic Road Safety Program include the “Slow Down Safety Zone” initiative, the PXO program and the Distracted Driving program.

## **2.4 Enforcement**

Enforcement includes the strategic use of enforcement resources in key areas for maximized effectiveness. The City’s Red Light Camera 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 changes to red are photographed. Vehicles are then fined for their violation and net 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.

## **2.5 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. The City’s new Advanced Traffic Management System (ATMS), other emerging technologies and the sharing of data with neighbouring municipalities and the MTO all have the potential to further support the evaluation of road initiatives.

## **3.0 Safety in Numbers**

The safety of vulnerable road users such as pedestrians and cyclists is important to the City of Hamilton. Academic research regarding the safety of pedestrians and cyclists emerged as the *Safety in Numbers Theory*. This theory states that with increased numbers of cyclists and pedestrians on the road these vulnerable road users will feel safer and more secure on streets.

The theory states that the behaviour of motorists controls the likelihood of collisions with persons walking or bicycling, as pedestrians and cyclists are unlikely to be more cautious in large numbers. With an increased awareness due to the presence of pedestrians and cyclists, motorists adjust their behaviour thus decreasing the likelihood and number of collisions by:

- Decreasing speed;
- Checking blind spots; and
- Making eye contact.

The number of collisions also decreases due to other factors including supporting infrastructure<sup>4</sup>.

#### **4.0 Justification System**

The use of a system of technical justification systems (or “warrants”) helps to identify the need and priorities to plan, design and construct improvements. Management of this system helps to improve the overall community safety through the continuous improvement process and the ability to be adaptive changing transportation trends.

#### **5.0 Recommendations**

A number of key actions have been identified below that will help achieve the vision identified in the City’s Strategic Plan and TMP, which will help facilitate healthy and safe communities. These include:

- Integrate the goals and principles of Vision Zero into the CLB streets design manual and Engineering Guidelines.
- 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.
- Implement a comprehensive collision data collection system integrating multiple modes of transportation and overlaying built environment data.
- Apply speed reduction techniques through the implementation of CLB streets as well as through other opportunities such as the introduction of protected cycling facilities.

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<sup>4</sup>P L Jacobsen. (2003). Safety in numbers: more walkers and bicyclists, safer walking and bicycling. *Injury Prevention*. 9(3), 205-209.