Case Study Series

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Vision Zero Canadian Landscape 2.0: Successes and Opportunities

parachute.ca/visionzero

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Vision Zero Canadian Landscape: Learning from Key Stakeholder Experiences

Parachute Vision Zero creates case studies that feature a variety of issues and examples of Vision Zero from across Canada and around the world. We hope these practical, evidence-based case studies will help educate, inform and inspire those who are interested in getting to zero. We share when we publish new case studies through our e-newsletter, **Word on the Street***.*

What's in this issue?

In January 2016, the Canadian Council of Motor Transport Administrators (CCMTA) introduced their fourth national road safety plan, a ten-year Road Safety Strategy modelled after the Vision Zero principles (CCMTA, 2016; CCMTA, 2018). The strategic vision is "Towards Zero: The Safest Roads in the World" (CCMTA, 2016). The overall focus of the strategy is to eliminate deaths and serious injuries on Canadian roads by combining the title principle with a "towards zero" approach and the Safe System Approach (SSA) to road safety. Subsequently, Parachute undertook two case studies of a total of 10 provincial and municipal jurisdictions that had adopted, implemented or were considering adoption of Vision Zero (Parachute, 2017a; Parachute, 2019). Thus far, the following jurisdictions have been profiled:

- In **May 2017**: British Columbia; Vancouver, BC; Hamilton, ON; Toronto, ON; Montreal, QC; Ottawa, ON; and Edmonton, AB (Parachute, 2017a)

- In **June 2019**: Surrey, BC; Region of Durham, ON; Kingston, ON (Parachute, 2019)

The current case study builds on these earlier findings, by:

- Reviewing the current status of all jurisdictions that are in the process of considering, adopting or implementing Vision Zero;

- Presenting the key features of their programs, using a consistent framework of the 5 Es of traffic safety (further described in Section 1) and additional focuses where warranted; and

- Discussing the successes and challenges faced by these programs with key stakeholders, as well as any advice they may have for jurisdictions that are contemplating formal adoption.

Throughout June to August 2019, Parachute profiled 24 jurisdictions, of which 14 jurisdictions provided interview responses.

Our focus is to facilitate a comparison of the features of Vision Zero programs and the diversity of implementation experiences, rather than a strict comparison of standardized counts and rates. This focus is responsive to earlier feedback from our Parachute Vision Zero Network stakeholders who had requested a better understanding of how to approach Vision Zero, and the facilitators and barriers to embracing a systems approach to increase road safety and end road fatalities and serious injuries.

It is our hope that this case study will help illuminate the successes and challenges faced by programs at different stages of Vision Zero adoption, implementation and evaluation, and provide relevant insights from the frontlines.

Note: The grey literature review featured in this paper is current as of July 2019. Jurisdictions that have made new materials available or that have newly expressed interest in Vision Zero since that time may not be included.

Acknowledgements

Throughout this paper, findings from the grey literature are supplemented by interviews with key stakeholders at the heart of each program, including traffic safety officers, engineers, enforcement officers, and other subject matter experts involved in adoption, implementation, and/or advocacy.

We extend our heartfelt thanks to all of the stakeholders who have contributed their time and insights into this special issue:

1. Background

1.1. Brief history of Vision Zero in Canada

Vision Zero was initiated in Sweden in 1997, in response to a philosophical belief that traffic fatalities were an unacceptable trade-off for being able to travel (Elvebakk, 2007; Kim, Muennig & Rosen, 2017). It has since been successfully deployed in jurisdictions around the world including in Germany, the United Kingdom, and various cities in the United States and Canada (Mendoza et al., 2017; Peterniak et al. 2016).

In Canada, the CCMTA is responsible for providing transportation safety advice to the Council of Deputy Ministers and Ministers, and regularly maintains and updates the national road safety strategy as part of its activities (CCMTA, 2016; CCMTA, 2018). The latest iteration of this strategy is the Road Safety Strategy 2025, published in 2016, which explicitly acknowledges a "towards zero" approach and the influence of Sweden's Vision Zero (CCMTA, 2016). The CCMTA's role is aligned with its mandate to facilitate both safe and efficient movement of people and goods, and provincial and territorial collaboration on matters of road safety (CCMTA, 2018). However, smaller jurisdictions are expected to build their own Vision Zero plans (CARSP, 2017; Dilgir, 2017).

At the time of this writing, several provinces and municipalities have initiated a Vision Zero strategy or are considering adopting such a strategy (Peterniak et al., 2016). Of these, many have formalized plans, which are crucial to securing commitment and resources for Vision Zero initiatives (Dilgir, 2017).

A full list of Canadian provinces, territories, regions and cities with a Vision Zero action plan may be found on the Parachute Vision Zero website: parachute.ca/visionzero.

1.2. What is Vision Zero?

Vision Zero is generally premised around the following principles: that serious injuries and fatalities on the road are preventable and should not be accepted as an inevitable cost of transport; that any number of traffic fatalities or serious injuries would be considered unacceptable; that road users and those who are responsible for the built environment or vehicle design all have a role to play in preventing traffic fatalities and serious injuries; and that it is possible to eliminate or reduce human error through changes to the built environment (City of Edmonton, n.d.-a; Elvebakk, 2007; Kim et al., 2017; Peterniak et al., 2016).

In a recent review of Vision Zero adoption in Canada, Peterniak et al. (2016) described a Vision Zero approach as including the following fundamental characteristics:

> "*Aggressive casualty and injury reduction goals, coordinated and multidisciplinary action, increased priority and resources allocated toward road safety improvement, and a specific ethical policy framework*". (p. 1)

Note that emphasis is placed on fatality and serious injury reduction goals, rather than the number of total crashes. Therefore, strategies such as lowering road speeds may be useful for achieving Vision Zero, given that lower speed reduces both the risk of being involved in a crash as well as the severity of the crash (Aarts & Van Schagen, 2006; Elvik, Christensen, & Helene Amundsen, 2004). For example, speed limits may be lowered to steer drivers towards rational road speeds, and a variety of speed management efforts cutting across different domains (e.g., education, enforcement, road design and land use) may be deployed to help reduce the most serious outcomes of collisions (Elvik, 2010; GRSP, 2008).

Vision Zero plans may also include specific enforcement methods (e.g. automated enforcement, enhanced enforcement efforts) and road design features, such as curb extensions and red-light cameras (Kim et al., 2017).

Jurisdictions may establish a Vision Zero plan in name while deploying countermeasures that take into account their unique policy milieu, budget and other contextual factors; and may also measure their outputs and interim outcomes differently from one another (CARSP, 2017; Dilgir, 2017; Peterniak et al., 2016). Finally, different contexts may result in different champions for Vision Zero (Peterniak et al., 2016). For example, while the program in Leduc, AB is primarily led by the city and enforcement, Toronto, ON's program is a shared enterprise between many stakeholders and collaborators representing public health, health care, enforcement, school boards and other interests (Browne, 2017; C. Chisholm, personal communication, Jul 17, 2019; City of Toronto, n.d.).

The above considerations result in a complex Canadian landscape of Vision Zero that is constantly changing and expanding. In the last 12 months alone, advocates in several jurisdictions have started to publicly discuss the merits of a Vision Zero approach, including in Windsor, Thunder Bay and Northeastern Ontario, as described in more detail later in this case study (CBC News, 2019c; Georgieva, 2019; Ross, 2019). However, the final form that these programs will take is unclear. Jurisdictions that do end up adopting Vision

Zero may choose to forego the label of "Vision Zero", as it could be misunderstood by the audience (Peterniak et al., 2016). They may also have no value statements, leaving it ambiguous whether or not they commit to Vision Zero principles (CARSP, 2017; Dilgir, 2017). All of these factors can make it challenging to assess and compare Vision Zero plans with a view to learning from experiences.

1.3. The Safe System(s) Approach

Vision Zero is often realized through a Safe System(s) Approach or SSA, a framework for injury prevention that is grounded in the principles of ethics, responsibility, safety, and mechanisms for change (CCMTA, 2016; WRA, n.d.-a).

In Canada, SSA is defined based on the principles that: life and health take precedence over mobility; that users, providers and regulators each have some responsibility for road safety; and that road traffic systems should reduce opportunities for human error (CCMTA, 2016). Part of how this is achieved includes ensuring that collision forces do not result in fatalities and serious injuries, which may involve a combination of lower speeds, safe road design and vehicle safety features working together (WRA, n.d.-b).

Consistent with the above, a "**Safe System**" may refer to a traffic system that embodies the Vision Zero ideal, i.e., "a road system that allows for human error without leading to death or serious injury" (GRSP, 2008, p. 14). Such a system represents safe road users, safe vehicles and safe road infrastructure (CCMTA, 2016).

1.4. 5 Es of traffic safety

The 5 Es of traffic safety generally refer to:

- Engineering

- Education

- Enforcement

- Evaluation

- Engagement

(e.g., City of Calgary, 2018; OTSE, MTSF, EPS, & Edmonton, n.d.; RCMP-K, 2018)

All references to the 5 Es throughout this case study relate to the above definition unless otherwise indicated.

2. Summary of Vision Zero Canadian landscape

Canadian cities, regions, and provinces or territories implementing Vision Zero

- British Columbia

- Calgary, AB

- Fort Saskatchewan, AB

- St. Albert, AB

- Manitoba

- Brantford, ON

- Hamilton, ON

- London, ON

- Trois-Rivières, QC

The following jurisdictions are presented without interview scripts: Edmonton, AB; Toronto, ON; Vancouver, BC; Saskatoon, SK; Region of Peel, ON; Halifax, NS. (Please note: Surrey, BC; Durham Region, ON; and Kingston, ON, are also implementing Vision Zero and were featured in an earlier case study: [Vision Zero: Implementation Experiences in Three Canadian Urban Communities](.).)

(15 total)

Cities and regions where adoption of Vision Zero is being debated, or is anticipated shortly

- Strathcona County, AB

- North Bay, ON

- County of Grande Prairie No. 1

- The following jurisdictions are presented without interview scripts: Leduc, AB; Ottawa, ON; Windsor, ON; Winnipeg, MB.

(7 total)

Public Health Units advocating for Vision Zero

- Southwestern Public Health, ON

- Timiskaming Public Health, ON

2 (total)

Canadian cities, regions, and provinces or territories implementing Vision Zero

2.1. British Columbia

Background

The Province of British Columbia (BC) is a province of approximately 4.6 million residents resulting in a population density of 5.0 per square km (Statistics Canada, 2019b). The total population is anticipated to grow to 5,180,200 - 6,662,100 by 2038, largely due to international migration (Statistics Canada, 2015b). In 2018, the province had approximately 3.8 million vehicle registrations, and 225,539 new motor vehicle sales were made in BC and the territories in the same year (Statistics Canada, 2019k; Statistics Canada, 2019w). Other notable contextual factors include the presence of alternative modes of transportation alongside drivers, and the growing proportion of drivers ages 60 and over in the province (Lacombe & Arason, 2013).

In BC, there were approximately 2,750 serious injuries and 350 fatalities associated with traffic incidents on public roads every year at the start of Vision Zero (Lacombe & Arason, 2013). Though fatality rates had dropped between 1996 and 2013 from a peak of 12.1 per 100,000 population to 5.9 per 100,000, the annual count of fatalities due to motor vehicle crashes continued to be high (Government of British Columbia, 2016). Similar trends could be found for rates of serious injury, i.e., rates of hospitalization due to motor vehicle crashes, which dropped from 96.6 per 100,000 population in 2002 to 67.5 per 100,000 in 2011, but 3,038 was still not close enough to zero (Government of British Columbia, 2016). Both the general public and municipal governments were interested in addressing road safety, particularly the issues of vehicle speeds and pedestrian safety, but most BC municipalities had earmarked less than 10 per cent of their transportation budget for road safety, and a lack of access to staff with road safety skills and experience was also noted (Government of British Columbia, 2015).

BC's approach to Vision Zero was articulated in 2013 via their BC Road Safety Strategy 2015 and Beyond (Lacombe & Arason, 2013). BC is explicit in its support of "zero traffic fatalities and serious injuries", as set out in their vision (Dilgir, 2014; Lacombe & Arason, 2013). BC's strategy supports SSA and emphasizes principles of collaboration, innovation, and sustaining successful activities (Lacombe & Arason, 2013; MacLeod, 2014).

Success will be measured via a decreasing number of motor vehicle fatalities and serious injuries per year, as well as decreasing rates per 100,000 population; specific targets are set by the municipalities at their discretion (Dilgir, 2014; Lacombe & Arason, 2013).

BC's Road Safety Strategy 2015 is connected to its Active Transportation strategy, [Move Commute Connect](#) (Government of British Columbia, 2019). BC has identified a direct link between activities such as building safe active transportation infrastructure and conducting active transportation safety research, and the goal of Vision Zero (Government of British Columbia, 2019). One of the key activities embodying this linkage is the BC Community Road Safety Toolkit, an educational tool that explicitly addresses the vulnerable position of pedestrians and cyclists, and proposes road designs that would promote their safe transport (Government of British Columbia, n.d.-b; Government of British Columbia, 2018a; Government of British Columbia, 2018b; Government of British Columbia, 2019).

Key features of the program

- **Data collection and analysis**: BC's road safety data derives from various sources including the Ministry of Health's Discharge Abstract Database, the BC Vital Statistics Agency database, and the Police Traffic Accident System database from the Insurance Corporation of British Columbia (ICBC) (Government of British Columbia, 2016; Lacombe & Arason, 2013). Detailed information is available about crash-related fatalities and injuries in BC, as well as demographics of victims of fatal crashes (Government of British Columbia, 2016; Government of British Columbia, 2018d). BC has also identified data needs across its municipalities, including collision data, speed data, and feedback from other jurisdictions regarding best practices (Government of British Columbia, 2015). In the future, it is anticipated that BC's Research and Data Committee will table a set of road safety data indicators and a data management framework for reporting that can be leveraged by all members of the BC Road Safety Strategy and municipalities (RoadSafetyBC, personal communication, Jul 31, 2019). Another key dimension of BC's approach to data is fostering research, which includes both conducting road safety research that looks at the SSA using BC data, as well as promoting collaboration and knowledge transfer with other jurisdictions (Lacombe & Arason, 2013).

- **Public health orientation**: BC's strategy enshrines the important role of public health in its first underlying principle, to "adopt a comprehensive Safe System Approach coupled with a public health perspective" (Lacombe & Arason, 2013). It looks at

upstream causes of collisions, such as traffic fatalities due to impairment by drugs or alcohol (Lacombe & Arason, 2013). A public health approach is inherently multidisciplinary and broad, and can also contribute rigour in the areas of surveillance methodology and injury prevention (Lacombe & Arason, 2013). An annual report from the Provincial Health Officer examines patterns and trends in traffic injuries and fatalities and describes underlying causes and remediation strategies based on an SSA framework (Government of British Columbia, 2016).

- **Education**: To facilitate knowledge transfer to municipalities and partners, BC surveyed its municipalities in 2015 to identify knowledge gaps, and its working committee subsequently developed an online resource that would address these gaps (Government of British Columbia, n.d.-b; TAC, 2018). The resources include descriptions of different road safety outputs along with evidence for their use, as well as implementation guidance and practical tips for activities such as data gathering, communicating to stakeholders, and evaluating efficacy (Government of British Columbia, n.d.-b; Government of British Columbia, 2018b; Government of British Columbia, 2018c; TAC, 2018). With respect to road user education, the ICBC offers online resources for drivers, cyclists, pedestrians and motorcyclists, including an online refresher test to assess driving knowledge (ICBC, n.d.-a; ICBC, n.d.-d; ICBC, n.d.-e; ICBC, n.d.-f). A sampling of other education interventions include the Graduated Licensing Program for new and young drivers, the Shift into Winter Campaign, the Be Truck Aware campaign for drivers, and BC's Driver Information System (a phone and Internet information service for drivers) (Government of British Columbia, n.d.-d; Lacombe & Arason, 2013). The education efforts of RoadSafetyBC are coordinated with those of other partners adhering to the BC Sector-Wide Road Safety Calendar (Government of British Columbia, n.d.-c; RoadSafetyBC, personal communication, Jul 31, 2019).

- **Enforcement**: Traffic enforcement is used in a manner that is complementary with public education, and both are emphasized in BC's strategy (Lacombe & Arason, 2013). Through the Driver Improvement Program, driving prohibitions are given to repeat violators (Lacombe & Arason, 2013). Multiple partners, including ICBC, police services, and the Superintendent of Motor Vehicles work together to apply penalty points, issue tickets, sanctions and charges to drivers; issue prohibitions from driving; and require drivers to participate in remediation programs (Government of British Columbia, n.d.-a; Government of British Columbia, n.d.-e).

- **Engagement**: BC's collaborative approach promotes locally appropriate solutions and seeks to engage local stakeholders, including First Nations communities (Lacombe & Arason, 2013). Early in the project, an online BC Communities Road Safety Survey was undertaken by the BC Road Safety Strategy team, canvassing feedback from 189 BC communities representing 3.2 million people from all parts of the province (Government of British Columbia, 2015). This activity helped the province to understand the baseline level of interest and investment in road safety across municipalities, and how their road safety priorities differed (Government of British Columbia, 2015).

- **Engineering**: BC takes advantage of low-cost or no-cost interventions in its engineering activities (Lacombe & Arason, 2013). Examples of actual interventions cited in BC's 2014 showcase of innovations included protected bike lanes, pedestrian scrambles, median barriers and narrowed lane widths (Amit, Arason, Mussell, & Woolsey, 2016). There is also a provincial Intersection Safety Camera program (ICBC, n.d.-b). As part of its strategic focus on safe vehicles and SSA, BC also looks to increase public awareness of vehicle safety features and to monitor vehicle safety issues in the province (Lacombe & Arason, 2013).

- **Evaluation**: The primary source for evaluation data related to BC's Vision Zero strategy is the province's annual Motor Vehicle Related Fatalities report, which looks back on the most recent 10 years of available injury and fatality data from police reports (Government of British Columbia, 2018d). Evaluation is also carried out by the ICBC: collision data contributes to the ICBC's decision regarding funding for community road safety projects as part of its Road Improvements Program, but the ICBC also conducts its own evaluation of the same program, looking at the safety outcomes of improved roads and return on investment of interventions (ICBC, n.d.-c; RoadSafetyBC, personal communication, Jul 31, 2019; Sayed & Sacchi, 2015).

Stakeholders who contributed to BC's Vision Zero plan include various municipalities and police services, BC Health Authorities, BC Medical Association, the Provincial Health Office, the Insurance Corporation of British Columbia, WorkSafeBC, the University of British Columbia, Mothers Against Drunk Driving (MADD), and many others (Amit et al., 2016; Lacombe & Arason, 2013). Altogether, over 160 road safety partners contributed to the plan (RoadSafetyBC, personal communication, Jul 31, 2019). Accountability for the delivery of the Road Safety Strategy lies with the province, and the strategy is formally led by the Office of the Superintendent of Motor Vehicles (CARSP, 2014).

From a governance perspective, BC's Road Safety Steering Committee sets the direction for five standing working committees focused on advising and implementing aspects of road safety such as safe vehicles, safe roads and communities, research and data, safe road users, and education and awareness (MacLeod, 2014). The Steering Committee includes senior executives from stakeholder organizations such as BC Coroners, the Ministry of Transportation and Infrastructure, the Ministry of Justice, and more, as well as First Nations representation; the working committees include other diverse organizations (Lacombe & Arason, 2013; MacLeod, 2014). RoadSafetyBC, the provincial agency tasked to deliver road safety in BC, coordinates the committees (Government of British Columbia, n.d.-a; MacLeod, 2014). The committees further interact with each other via the Road Safety Assembly, which is convened on a yearly basis by the Office of the Superintendent of Motor Vehicles (Lacombe & Arason, 2013; MacLeod, 2014).

Since Vision Zero was initiated, BC's subject matter expertise has increased alongside new measures coming into force, such as the legalization of cannabis, increase in distracted driving, Automated Speed Enforcement (ASE), high friction surface treatments, infrastructure upgrades to more active transportation, increase in bus/skytrain usage, and variable speed limits (RoadSafetyBC, personal communication, Jul 31, 2019).

Various data exist that speak to the outcomes of BC's approach. According to police-reported data, the annual count of injuries from crashes increased from 20,789 in 2013 to 21,039 in 2017, and the annual count of fatalities increased from 269 in 2013 to 276 in 2017, though both counts were down from those recorded in 2008 at the start of tracking (Government of British Columbia, 2018d). However, a look at rates per 100,000 population paints a different picture; police-reported fatalities decreased from 5.9 to 5.7 per 100,000 and police-reported injuries decreased from 445.6 to 436.8 per 100,000 (Government of British Columbia, 2018d). Importantly, police reported data represent roughly 10 to 13 per cent of motor vehicle crashes reported to the ICBC in any given year, and injuries in ICBC-reported crashes have increased over time, from 85,000 in 2013 to 95,000 in 2017 (Government of British Columbia, 2018d).

What the Province has to say

*Interview with **Colleen Hildebrandt**, Outreach Manager, Road Safety Strategy, Policy & Strategic Initiatives Branch, RoadSafetyBC and **Erin Anderson**, Senior Manager, Road Safety Strategy and Stakeholder Relations, RoadSafetyBC*

PARACHUTE: What would you consider to be your program's greatest successes or achievements?

COLLEEN, ERIN: Our greatest success is the collaboration and ongoing engagement with all our partners across the road safety sector. The individuals working in the sector are passionate about their work, and improving road safety in their communities. This shared vision has allowed us to better work together and help support and promote each other's work and road safety efforts.

PARACHUTE: Conversely, what challenges has the program faced? How did you overcome these? Please feel free to focus on one or two significant challenges in your response.

COLLEEN, ERIN: One challenge is improving data collection methods in order to help identify areas for intervention from all road safety partners, and sharing data to get the "big picture" on why collisions occur. We are working with our partners on linking data through the Research and Data Committee, a sub-committee under the BC Road Safety Strategy (BCRSS).

The same committee is currently working on a road safety data indicators project; this project proposes the development of a set of road safety indicators that can be used by all members of the BCRSS and other stakeholders (e.g., local governments) who aim to create system-wide road safety improvements. The project includes a data management framework for reporting. This proposal is a sub-project of a larger, Health Authority-led project on all-cause injury indicators. This sub-project aims to generate needed consensus among decision makers and funders in BC around preferred road safety indicators.

Another challenge is collaboration with the public health sector, which is crucial to advancing road safety. For example, the health sector collects data on injury severity and characteristics, and offers insight into how to prevent and reduce the severity of injuries. Integrating and including this perspective in road safety analysis is imperative.

PARACHUTE: If you had one piece of advice to give to jurisdictions that are contemplating Vision Zero adoption, what would it be?

COLLEEN, ERIN: One of the main principles of Vision Zero is collaboration, and BC works with over 150 representatives from nearly 60 road safety partner organizations – with the common goal of zero traffic fatalities and serious injuries on our roads. Sharing a common goal and working in a truly collaborative environment has been one of the key successes to our made-in-BC approach to Vision Zero.

Our one piece of advice would be to bring multiple partners and experts together to solve road safety concerns in your area to create an approach catered to your jurisdiction.

2.2. Calgary, AB

Background

The City of Calgary recorded a population of 1.3 million in 2018 and had a population density of 1,501.1 per square km based on the 2016 census (City of Calgary, n.d.-a; Statistics Canada, 2019c). Both natural increase and net migration are contributing to the growth of the city, which has seen the population increase year over year since 1994 (City of Calgary, n.d.-a). Its core business district downtown is surrounded by low-density suburban communities, which results in pressure on the system to perform when populations travel downtown (T. Churchill, personal communication, Jun 19, 2019). The size of the city also makes it challenging to plan for road safety (T. Churchill, personal communication, Jun 19, 2019).

Although detailed recent data is unavailable, it is known that 95 pedestrians were killed and 3,317 injured between 2005 and 2014 in Calgary (Howell & Klingbeil, 2018).

In July 2013, Calgary approved the Safer Mobility Plan 2013-2017, which cited the SSA and 5 Es of traffic safety. At the time, formal adoption of Vision Zero was posited as a future direction (City of Calgary, 2017). Even though the City already recognized the importance of working towards zero fatalities and serious injuries, it also knew that implementing Vision Zero would mean more than adopting the target; it would require additional resources and a thoughtful effort to reduce speeds in urban areas, among various other road safety efforts (City of Calgary, 2017).

Six years later, the latest Safer Mobility Plan 2019-2023, published in 2018, clearly sets out Calgary's commitment to Vision Zero and explicitly endorses "mobility free of major injuries and fatalities", in addition to SSA and the 5 Es (City of Calgary, 2018). Other guiding principles include following a locally developed process, using evidence-based practices that consider emerging technologies, building strong partnerships with relevant stakeholders, and treating traffic safety management as an investment for the city (City of Calgary, 2018).

Under the latest plan, Calgary aims to cut down the number of major injury and fatality collisions by 25 per cent and reduce the count of vulnerable road user collisions by 25 per cent (City of Calgary, 2018). This simplifies targets from the earlier Safer Mobility Plan 2013-2017, which spanned six focus areas, including speeding involved casualty collisions and vulnerable road user casualty collisions (City of Calgary, 2017).

The Safer Mobility Plan is supported by the City's [Step Forward Pedestrian Strategy](#), which has "significant reductions in collisions and fatalities by 2025" as one of its goals, and "launching a Vision Zero campaign" as one of its action items (City of Calgary, 2016).

Key features of the program

- **Data collection and analysis**: A key facet of the Calgary Transportation Plan is to track and log statistics on community transportation safety, explicitly to support "reducing injuries and fatalities" (City of Calgary, 2009). To that end, the Calgary Police Service and Calgary city staff involved in transportation jointly collect cycling collision data (City of Calgary, n.d.-h). Automated/video-based conflict analysis has also been trialed at certain intersections (City of Calgary, n.d.-i; T. Churchill, personal communication, Jun 19, 2019). Data has trained the focus of the Safer Mobility Plan on specific types of high severity collisions, including rear end collisions and right-angle collisions (City of Calgary, 2018).

- **Education**: Numerous educational resources are available on Calgary's website, including materials related to pedestrian safety; promoting reporting of impaired drivers; promoting safe winter driving; and more (e.g., City of Calgary, n.d.-d; City of Calgary, n.d.-j). Advice is targeted to each category of road user, including pedestrians and cyclists (City of Calgary, n.d.-j). Education is also provided in residential areas and playground zones by volunteers in the Community Speed Watch Program, and on an ad-hoc basis, e.g., by Calgary Police and the Calgary Downtown Association during the introduction of a new cycle track (City of Calgary, n.d.-b; City of Calgary, n.d.-h). Monthly traffic safety focuses allow for more in-depth road user advice in relevant topic areas, such as distracted driving (City of Calgary, n.d.-k).

- **Enforcement**: Calgary deploys high-tech speed limit observation and warning system or "SLOWS" radar devices in select communities identified as having speed issues; their purpose is to facilitate enforcement of, and education about, speed limits without requiring an operator (City of Calgary, n.d.-f). Photo radar is installed in Calgary based on provincial guidelines, in areas such as school zones or construction zones (City of Calgary, n.d.-e).

- **Engagement**: The City of Calgary receives feedback from and engages the public on its road safety programming through its Roads Annual Survey, Ward Traffic Safety Meetings, and 311 inquiries (City of Calgary, 2018). Certain limited information may be available from the annual spring pulse telephone survey carried out by the City

and Ipsos, e.g., related to residents' satisfaction with city streets, and their thoughts on whether further investment is needed into streets and on-street bikeways (City of Calgary & Ipsos, 2019).

- **Engineering**: The need for engineering improvements is gauged through road safety audits, network screening, and in-service road safety reviews (City of Calgary, 2018). Road design measures include installing temporary traffic calming curbs in high-risk areas, building more on-street bikeways, and roundabouts for new intersections (City of Calgary, n.d.-g; City of Calgary, n.d.-h; City of Calgary, 2011; City of Calgary, 2018). Innovative measures are being assessed, including rectangular rapid flashing beacons and high friction surface treatment (City of Calgary, n.d.-c). The Complete Streets Policy 2014, which supplements the Calgary Transportation Plan with concrete guidance, describes how to build complete streets that are safer for all road users, principally by lowering driving speed; alternative designs are only accepted under qualified conditions (City of Calgary, 2014).

- **Evaluation**: Evaluations focus on multiple interventions, and include studying reduced speed limits and the impact of rectangular rapid flashing beacons on safety (City of Calgary, 2018). An annual report of the program's progress is provided to council (T. Churchill, personal communication, Jun 19, 2019). Rates of injury and fatality are reviewed to facilitate prioritization of safety improvements, e.g., prioritizing intersections at risk so that in-service road safety reviews can be undertaken and countermeasures installed (City of Calgary, 2017; T. Churchill, personal communication, Jun 19, 2019).

Key stakeholders in Calgary's program include the City, Calgary Police Service, Alberta Health Region, the Alberta Motor Association, and the University of Calgary (City of Calgary, n.d.-i). The City collaborates with the province of Alberta, e.g., by following their traffic safety plan calendar (T. Churchill, personal communication, Jun 19, 2019).

Major injury and fatality collisions have begun trending downward from 586 in 2015 to 528 in 2017; however, this number remains higher than the 476 major injury and fatality collisions seen in 2013 (City of Calgary, 2018). Parachute will continue to monitor Calgary's progress as more information regarding Vision Zero outcomes is made available.

What the City has to say

*Interview with **Tony Churchill**, Leader, Traffic Safety Operations, The City of Calgary*

PARACHUTE: What would you consider to be your program's greatest successes or achievements?

TONY: The annual report back to council was good. It was a good opportunity to communicate back what we had done. It showed the evaluations that we'd been doing and things that were having value to build trust. Some specific things that we were doing that were able to demonstrate value, was rectangular rapid flashing beacons and pedestrian beacons. Another one was harmonization, and reduced speed zones around playgrounds - these used to have different days when they were in effect, now they are in effect every day of the year.

We demonstrated good reductions in speed and injury. Something that was effective for us was modular traffic devices that you can put out at a relatively low cost: 1/10th of cost of permanent traffic calming measures. These demonstrated the opportunity of the environment to change pedestrian behaviours; the change can be made quickly and cheaply, and is visible to citizens, and that gives value.

PARACHUTE: Conversely, what challenges has the program faced? How did the program overcome these? Please feel free to focus on one or two significant challenges in your response.

TONY: One challenge when the program was getting started was existing procedures and practices within organizations. When working with partner agents, we were resolving some of the issues about how we work together, and explaining why the types of things that we were talking about were important to change. Implement more organized change management and take the time to have difficult conversations, rather than stopping when you get a no. In the first iteration [of the Safer Mobility Plan], Vision Zero was embedded but quite subtle in the vision and mission. Now, Vision Zero is on the front of the new plan.

Being properly funded, so that you can have resources to make projects happen, and evaluate properly, is another challenge. If some dedicated amount can be identified up front, that would definitely help.

We are commonly asked, "why are we even focusing on this…", so having good data is important.

PARACHUTE: If you had one piece of advice to give to jurisdictions that are contemplating Vision Zero adoption, what would it be?

TONY: Keep it simple. Talk about the Vision Zero principles. What you're going to get at the end of the day may not completely eliminate collisions. However, if one collision happens, you don't want anyone killed or seriously injured. There are things that we can do to achieve that. Start small. Evaluating and communicating results is really important to build trust and understanding.

PARACHUTE: What is the "vision" for your Vision Zero program over the next five years?

TONY: Continuing with the plan and seeing where we go.

2.3. Edmonton, AB

Background

The City of Edmonton had a population of 899,447 in 2016, having grown steadily over the past two decades (City of Edmonton, n.d.-e; City of Edmonton, 2019). Out of 315,032 surveyed individuals, 72.27 per cent of those surveyed reported driving a car, truck or van as their main mode of transportation to work, followed by 13.41 per cent taking public transit (City of Edmonton, n.d.-f). Though there is intense road use, approximately 23 per cent of residents do not feel that the streets are well designed, and 33 per cent disagree that the transit system is well-designed and attractive (Leger & City of Edmonton, 2018).

From a safety perspective, there were 19 fatal collisions and 2,610 injury collisions on Edmonton's roads in 2018 (City of Edmonton, n.d.-a). These resulted in 19 fatalities and 3,307 injuries of which 319 were deemed serious injuries, i.e., resulting in hospital admission (City of Edmonton, n.d.-a). Following too closely was the cause of collision that resulted in the highest number of fatal or injury collisions, at 43 per cent (City of Edmonton, n.d.-a).

Edmonton has positioned itself to address these issues. It is a city of road safety firsts: its Office of Traffic Safety was the first municipal traffic safety office in North America, beginning in 2006, and in 2015 it became the first major Canadian city to adopt Vision Zero (Thue, Grekul, Islam, & Wang, 2016). In its Road Safety Strategy 2016-2020, Edmonton is explicit in acknowledging a target of zero injuries and fatalities, and emphasizes the SSA as well as the 5 Es of Traffic Safety (OTSE et al., n.d.).

In addition to a concrete target of zero injuries and fatalities by 2032, Edmonton has set out year-over-year targets for both rates of collision injuries in general and at intersections (City of Edmonton, n.d.-d; Thue et al., 2016). Edmonton uses two primary outcome measures to gauge success: the rate of collision injuries per 1,000 population (target is 3.0/1,000 by 2020), and the rate of collisions at intersections per 1,000 population (target is 13.5/1,000 by 2020) (OTSE et al., n.d.).

Key features of the program

- **Data collection and analysis**: Collision data used by the City derive from Edmonton Police Service-reported collisions, which are collated in the Motor Vehicle Collision Information System by the City's Traffic Safety Section (City of Edmonton, n.d.-a). Data include information about the number of fatal and injury collisions on public

roadways in Edmonton, as well as details of the number of fatalities and injuries, severity of injuries, underlying causes, time and date of collisions, where collisions are clustered in the city, and demographic characteristics of those involved (City of Edmonton, n.d.-a).

- **Education**: Road safety education in Edmonton includes knowledge exchange across jurisdictions (e.g., hosting the International Urban Traffic Safety Conference), as well as education programs for road users that take into account their attitudes and beliefs about road safety (e.g., "Four Things to Know" campaign to improve driver awareness of cyclists) (City of Edmonton, n.d.-c; OTSE et al., n.d.). Education is being realized in innovative ways, e.g., by having two-way Twitter engagement (City of Edmonton, n.d.-d). A traffic-safety-culture index will be used to determine whether education programs are working (OTSE et al., n.d.).

- **Enforcement**: Data are being used to identify areas with high levels of road safety violations and to target limited enforcement resources accordingly; at times, enforcement resources may be directed to specific issues, such as safe school zones (OTSE et al., n.d.). Police are interested in various risky behaviours including driving while impaired, distracted driving, not wearing a seatbelt, speeding and more (OTSE et al., n.d.).

- **Engagement**: Shortly after Edmonton's current road safety plan was adopted, a traffic safety online and telephone survey of 3,600 road users and community members was undertaken to better understand attitudes and perceptions of various driving behaviours, reasons for engaging in in these behaviours, and opinions on traffic safety policy options, as well as residents' awareness of Vision Zero itself (Thue et al., 2016). Various forms of communication are being developed, tested and evaluated for ongoing engagement, including an informational road-safety app and social media (OTSE et al., n.d.). There are regular efforts to solicit the public's feedback for transportation-related projects, e.g., through pop-up events, engagement at community locations such as Tim Horton's, and door-to-door approaches (City of Edmonton, n.d.-c; City of Edmonton, n.d.-d; OTSE et al., n.d.).

- **Engineering**: Edmonton audits roads and carries out network screening to facilitate design improvements (OTSE et al., n.d.). The City also leverages Community Traffic Management, a form of public engagement that takes place during neighbourhood renewal planning that helps to identify locally appropriate solutions to include in the

plan (City of Edmonton, n.d.-d). A number of roadway improvements for different road user types have been made since Edmonton adopted Vision Zero, including 14 new right-turn redesigns for drivers, 187 new driver feedback signs providing automated speed readings, 54 signal visibility improvements, and installation of protected bike lanes (City of Edmonton, n.d.-c; City of Edmonton, n.d.-d; City of Edmonton, n.d.-g).

- **Evaluation**: Edmonton's annual motor vehicle collision reporting distinguishes counts, rates and analyses related to fatal and injury collisions from those of all collisions, which helps to demonstrate the efficacy of Vision Zero (City of Edmonton, n.d.-a). In addition to annual reporting, Edmonton aims to put in place a Law Enforcement Research Chair, who will work jointly with the Urban Traffic Safety Research Chair to evaluate the efficacy of different kinds of road safety initiatives as well as flag opportunities for new programming (OTSE et al., n.d.).

Key stakeholders include Edmonton's Road Safety Advisory Committee, which comprises sub-committees and task groups organized around facets of road safety and key issues, such as road safety communications, speed management and school safety (OTSE et al., n.d.). Other key stakeholders include Alberta Health Services; Edmonton Police Service; the University of Alberta Centre for Smart Transportation; Alberta Safety Council, a not-for-profit organization focusing on safety training and education; and other public and private-sector partners from across disciplines (ASC, n.d.; City of Edmonton, n.d.-d).

Since the launch of Edmonton's Vision Zero strategy in 2015, the annual count of injuries has decreased from 3,805 to 3,307 in 2018, though not linearly (City of Edmonton, n.d.-a); pedestrians, cyclists and motorcyclists have all seen annual counts of minor and serious injuries decrease from 2015 counts, with the exception of serious injuries among pedestrians, which increased year over year between 2016 and 2018 (City of Edmonton, n.d.-a). The annual count of traffic fatalities has also decreased from 32 in 2015 to 19 in 2018 in a non-linear fashion (City of Edmonton, n.d.-a). The total number of fatalities and serious injuries has decreased by 18.6 per cent between 2015 and 2018 (City of Edmonton, n.d.-d). The total number of speeding tickets issued by mobile automated enforcement has also decreased between 2016 and 2018, and has consistently decreased between 2015 and 2018 for the categories of tickets exceeding the speed limit by 21km/hr or more (City of Edmonton, n.d.-d).

Edmonton is a member of the **Capital Region Intersection Safety Partnership**, a.k.a. **CRISP**, a knowledge sharing group for traffic safety stakeholders in the Alberta Capital Region, whose vision is that "Alberta's Capital Region roads will have no serious injury or fatality collisions" (CRISP, n.d.; CRISP, 2017). Note that members have different degrees of acceptance of Vision Zero; Morinville, for example, acknowledges the philosophy of Vision Zero while setting out non-zero targets in its Traffic Safety Plan (Morinville Enforcement Services & Town of Morinville, n.d.). However, many of the cities have formally adopted and are using the terminology of Vision Zero, as described in the next sections.

2.4. Fort Saskatchewan, AB

Background

The City of Fort Saskatchewan (FS) has a population of 26,942 based on the latest municipal census of 2019, experiencing a 26.8 per cent increase in population between 2011 and 2016 (City of Fort Saskatchewan, n.d.; Statistics Canada, 2019d). In addition to an estimated 91 per cent of individuals commuting to work by car, truck or van, FS is associated with a large volume of commercial traffic. For example, over 600,000 commercial movements have been recorded in one direction at one of the City's major intersections (B. Ward, personal communication, Jul 5, 2019; Statistics Canada, 2019d).

Although the City did not have any fatal collisions in 2018, two fatal collisions were reported in 2017, and minor injury collisions are also increasing (City of Fort Saskatchewan, 2019). Furthermore, in a 2016 survey of the residents and business owners of FS, respondents identified 121 locations across the city and on various road types, that raised safety concerns due to issues such as congestion, visibility, poor lighting and speeding (City of Fort Saskatchewan, 2018b).

In January 2018, FS formally adopted Vision Zero (City of Fort Saskatchewan, 2018a; Myroon, 2018a). FS has made its commitment to zero road fatalities explicit in its communications (City of Fort Saskatchewan, 2018a; Myroon, 2018a). [The City of Fort Saskatchewan Protective Services Traffic Safety Plan 2019-2022](#) is also aligned with the SSA and the 5 Es of traffic safety (City of Fort Saskatchewan, 2018a; Myroon, 2018a). Significantly, FS elaborated on the SSA principles to clarify maximum target speeds for different types of road scenarios that would be consistent with the prevention of road fatalities. The City then mapped these scenarios against new functional road classifications (e.g., "expressway", "arterial") in order to facilitate standardization of speed limits (B. Ward, personal communication, Jul 5, 2019; City of Fort Saskatchewan, 2018b).

Key features of the program

- **Data collection and analysis**: FS collects and analyzes collision information to fine-tune its enforcement efforts (City of Fort Saskatchewan, 2018a; Myroon, 2018a). Data are derived from Royal Canadian Mounted Police (RCMP) and Municipal Enforcement Services reporting, and are analyzed within the Protective Services Department (City of Fort Saskatchewan, 2019). Some data are generated by intersection safety devices as well (City of Fort Saskatchewan, 2019). Types of data analyzed include collision time, date, location and cause; type of vehicle; speeds and

volumes; and sustained traffic safety complaints (B. Ward, personal communication, Jul 5, 2019).

- **Education**: Traffic safety education is a key part of the mandate of FS Protective Services (i.e., tied to enforcement) (City of Fort Saskatchewan, 2019). Examples of education include annual bike rodeos, school presentations about pedestrian safety, training on installation of car seats and inspecting car seats, and "Option 4 programs" to educate ticketed offenders about their violation (B. Ward, personal communication, Jul 5, 2019; City of Fort Saskatchewan, 2019). Traffic officers also receive training on how to accurately note collisions (City of Fort Saskatchewan, 2019).

- **Enforcement**: FS leverages automated traffic enforcement (ATE) tools, such as intersection safety device cameras and photo-laser devices, in conjunction with conventional enforcement (City of Fort Saskatchewan, 2018a; Myroon, 2018a). FS's traffic safety plan seeks to reduce the frequency and severity of injury and property damage collisions at the top five sites for these types of collisions (City of Fort Saskatchewan, 2019). In FS, repeat offenders caught by the cameras are being tracked through the repeat violator program and are being followed up by peace officers, who will offer suggestions and clarify consequences of further violations (B. Ward, personal communication, Jul 5, 2019; City of Fort Saskatchewan, 2018a).

- **Engagement**: The first year of Vision Zero coincided with a period of strong public engagement that saw road users surveyed on their attitudes towards issues such as rolling stops and distracted driving; as well as "My Fort, my city, my say", a comprehensive multimedia survey of residents' thoughts on various issues, including traffic volumes (Intelligent Futures, 2018; Myroon, 2018b). FS continues to engage the public by soliciting their requests through the "Fort Report" online tracker, and by including them in the Traffic Safety Working Group run by Protective Services (City of Fort Saskatchewan, 2019). FS has also made its ATE ArcGIS maps available to the public via its Fort Saskatchewan Automated Enforcement map (City of Fort Saskatchewan, 2019b).

- **Engineering**: Types of road design changes that have come into play since the adoption of Vision Zero in FS include high-visibility, solar-powered cross-walks; re-design of school zones to include better signage, curb bump outs and other features; protected left turn lanes in the design of all major intersections; delay in left turn signalling in favour of pedestrians at a major highway intersection; rectangular rapid

flashing beacons; and more (B. Ward, personal communication, Jul 5, 2019; City of Fort Saskatchewan, 2018a). Though some highways had their speed limits lowered to 70km/hr even before Vision Zero adoption, FS has also considered further lowering speed limits on local and collector roadways to 60km/hr as part of its Transportation Master Plan (City of Fort Saskatchewan, 2018a; City of Fort Saskatchewan, 2018b).

- **Evaluation**: Protective Services circulates collision reports and ATE data on a weekly, monthly and yearly basis (City of Fort Saskatchewan, 2019a). Municipal Enforcement Services and Protective Services will review the collision data to determine if the current traffic safety strategy is working (City of Fort Saskatchewan, 2019a). In addition, the City also monitors whether the "Option 4" program is working by tracking whether ticket offenders' driving behaviour has changed following their education session (B. Ward, personal communication, Jul 5, 2019).

Key stakeholders at FS include the Traffic Safety Working Group, which comprises the city's Protective Services, Fire, Roads, and Engineering departments; public and private school boards; Alberta Transportation; and the Policing Committee (B. Ward, personal communication, Jul 5, 2019). It also includes enforcement in the form of RCMP and Municipal Enforcement Services (B. Ward, personal communication, Jul 5, 2019). The City works with the province of Alberta, particularly Alberta Justice in the development of affidavits to support ATE and conventional enforcement prosecutions (B. Ward, personal communication, Jul 5, 2019). FS is also a member of CRISP (CRISP, n.d.).

Following Vision Zero adoption, some outcomes data are available. The year 2018 recorded a lower fatal and injury collision rate per 1,000 residents than 2015 (1.633 vs. 1.872), as well as a lower fatal and injury collision count (43 vs. 45) (City of Fort Saskatchewan, 2018a). One fatality has been recorded in 2019 as of this writing (B. Ward, personal communication, Jul 5, 2019). Other changes that have taken place since Vision Zero adoption include dedicated funding from City Council and the introduction of a Transportation Master Plan (B. Ward, personal communication, Jul 5, 2019).

What the City has to say

*Interview with **Brad Ward**, Director, Protective Services, Director of Emergency Management, City of Fort Saskatchewan*

PARACHUTE: What would you consider to be your program's greatest successes or achievements?

BRAD: Reduced fatal and serious injury collisions, greater public awareness, greater awareness and support by council, greater engagement and buy-in by enforcement personnel, greater collaboration between City Departments, regional cooperation and collaboration to enhance traffic safety, and quantifiable financial and social impacts of serious injury collisions.

PARACHUTE: Conversely, what challenges has the program faced? How did you overcome these? Please feel free to focus on one or two significant challenges in your response.

BRAD: While we have been recognized by our Alberta Transportation representative as being one of the leading communities in Alberta for traffic safety, we don't have a dedicated resource to champion Vision Zero and traffic safety. This critical work is but part of a larger mandate of the staff who participate.

Sustained community engagement. We pay for radio ads and occasional print information. We have weekly traffic safety messages we offer that often are printed in one of the local newspapers, and are frequently interviewed for short news stories. We've also had a couple large feature story articles about traffic safety published in our local newspapers.

School board engagement has been spotty on occasion.

PARACHUTE: If you had one piece of advice to give to jurisdictions that are contemplating Vision Zero adoption, what would it be?

BRAD:

• Ensure you have passionate staff who understand the Vision and the Safe System Approach to traffic safety.

- Form a local Traffic Safety Working Group. Consider adding commercial/industry representatives if the volume of traffic warrants.

- Worry first about doing the work. Being named a Vision Zero community by your local Council is helpful but is not essential to using a Safe System Approach.

- Consult others who are Vision Zero communities and leverage the programs and approaches they have found to be successful.

- Attend traffic safety/Vision Zero conferences. Edmonton's International Conference on Urban Traffic Safety is one such excellent conference. Internationally recognized speakers share experiences and strategies from Europe, Australia, the USA, and Canada, among others.

- Research and read.

- Hire an analyst. Traffic Safety should be evidence led and supported. If you can validate your work objectively, you can ensure you are doing the right things at the right time.

PARACHUTE: What is the "vision" for your Vision Zero program over the next five years?

BRAD:

- We will have no fatal and serious injury collisions.

- Fort Saskatchewan will continue as a Vision Zero community and our Safe System Approach will be engrained in the community's fabric.

- We will contribute to the success of others.

2.5. St. Albert, AB

Background

St. Albert, AB is a small city in the Edmonton Metropolitan Region (EMRB, n.d.). The City has a population of 65,589 per the 2016 census, up nearly seven per cent from 2011, and has a population density of 1,353.9 per square km (Statistics Canada, 2019p). As part of the City of St. Albert Municipal Development Plan, the city hopes to grow to a population of 100,000 (City of St. Albert, 2016; Urban Strategies Inc., ISLELS, & City of St. Albert, 2019), which may impact road volumes in the future. Based on a 25 per cent sample from the 2016 census, approximately 86.1 per cent of those sampled mainly commuted to work via car, truck or van, followed by 4.6 per cent who are passengers in the same vehicles and 4.6 per cent who take public transit (Statistics Canada, 2019p).

In 2017, St. Albert saw one fatal collision and 211 injury collisions recorded on public roadways, breaking the prior trend of no fatal collisions between 2014 and 2016 (City of St. Albert, n.d.-a; TranSafe, WCG, & City of St. Albert, 2018). Altogether, there had been 63 major injuries (i.e., resulting in hospitalization) and six fatalities recorded in the City between 2012 and 2016 (TranSafe et al., 2018).

In 2018, St. Albert Vision Zero for its road safety strategy, through the development of their Transportation Safety Plan 2018-2025 (D. Schick, personal communication, Jun 25, 2019). In the Transportation Safety Plan, the City explicitly references the goal of "elimination of fatalities and major injuries within [St. Albert's] transportation system" (TranSafe et al., 2018). To achieve this goal, St. Albert leverages SSA and the 5 Es of traffic safety (City of St. Albert, n.d.-b; D. Schick, personal communication, Jun 25, 2019; TranSafe et al., 2018), though engagement is sometimes omitted (City of St. Albert, 2018d).

In addition to the above, the Plan leverages three additional frameworks. First, the Plan supports the five pillars of sustainability, cited as "Social, Economic, the Built Environment, the Natural Environment, and Culture" (TranSafe et al., 2018, p. i). Secondly, the Plan seeks to realize its vision through the principles of Integration, Network, Sustainability (of funding), Protection of the most vulnerable, Innovative, Respect, and Evidence-based, a.k.a. "INSPIRE" (TranSafe et al., 2018). Finally, the activities of the Plan are organized by a framework of focus areas, which include intersections, vulnerable road users (here defined as "including pedestrians, cyclists, motorcyclists, and the visually-, hearing-, or mobility-impaired" (TranSafe et al., 2018, p. iv), vehicle speeds,

distraction, young drivers (ages 16-25) and safer vehicles (via technology) (TranSafe et al., 2018).

The target of the Plan is to ensure "a year-to-year reduction in fatalities and injuries", with a view to eventually reaching zero fatalities and injuries (TranSafe et al., 2018, p. iii).

St. Albert's Transportation Safety Plan is directly supported by a [Transportation Safety Implementation Plan](#) that describes the activities specific to each road safety strategy, the partners involved in each, and places the activities into a timeline (City of St. Albert, n.d.-b). Updated Network Screening results and budgets may cause the Implementation Plan to be revisited (City of St. Albert, n.d.-b).

The Transportation Safety Plan is also supported by a system of other transportation network related plans that all reinforce the idea of road safety as a priority (D. Schick, personal communication, Jun 25, 2019). For example, St. Albert's Complete Streets Guideline and Implementation Strategy 2018 proposes to improve safety by designing streets for all types of road users and for the posted speed limit (City of St. Albert, 2018b). Another example is St. Albert's Intelligent Transportation Systems Strategic Plan 2018, which emphasizes the support of the TSP's goal of zero fatalities or serious injuries "as a priority" through innovative growth and improvement of the transportation network, and will help facilitate data gathering for network screening (ASA & City of St. Albert, 2018; D. Schick, personal communication, Jun 25, 2019).

Key features of the program

- **Data collection and analysis**: St. Albert's data is generated by the RCMP's reports of public and private roadway collisions, including fatal and injury collisions, which are provided through E-Collisions to the city and tabulated in St. Albert's own data file (City of St. Albert, n.d.-a). St. Albert's reporting captures details such as the location of the collision (e.g., intersection vs. midblock), collision time of day and year, cause and at-fault driver's demographic information (City of St. Albert, n.d.-a). More work is being done to classify major and minor injuries in the data (D. Schick, personal communication, Jun 25, 2019). Apart from RCMP data, St. Albert also collects and uses reports of concern from road users across the city (D. Schick, personal communication, Jun 25, 2019).

- **Education**: St. Albert's website includes educational resources for road users with respect to speed limits, driving and sharing the road with commercial vehicles, riding

and sharing the road with motorcyclists and pedestrian safety (City of St. Albert, 2018a; City of St. Albert, 2018c; City of St. Albert, 2019a; City of St. Albert, 2019c). Education also encompasses activities in the community; an example is the Speed Awareness Program, which uses a radar-equipped trailer to capture and display road user speeds in areas such as playgrounds and construction zones (City of St. Albert, 2019c). As part of the Transportation Safety Plan, the City intends to look at public education around distracted driving, impaired driving, free-flow right-turn lanes, sharing the road with cyclists, and other relevant topics for all types of road users (TranSafe et al., 2018).

- **Enforcement**: St. Albert employs photo enforcement and red-light cameras, and both the criteria for installing photo enforcement sites and their locations are made transparent to the public (City of St. Albert, 2018d; City of St. Albert, 2019b). As part of the Transportation Safety Plan, enforcement measures will be used to address issues such as distracted driving and red-light violations (City of St. Albert, n.d.-b; TranSafe et al., 2018). There will also be reviews of policies and bylaws, e.g., around school zones, parking near crosswalks and speed limits for neighbourhood roadways (TranSafe et al., 2018).

- **Engagement**: To create an appropriate and acceptable Transportation Safety Plan, the City of St. Albert first engaged both internal and external stakeholders (TranSafe et al., 2018). In the future, further engagement of the public will take place on issues such as neighbourhood traffic calming (TranSafe et al., 2018). Other methods of ongoing engagement include promotion of safe driving phone applications (TranSafe et al., 2018).

- **Engineering**: Examples of engineering interventions proposed by the City's Transportation Safety Plan include gateway treatments for transitions to slower-speed areas, appropriate signage for grade crossings of the rail line, separated bicycle lanes, installation of pedestrian countdown signals and accessible pedestrian signals at priority intersections, among others (TranSafe et al., 2018). Roadway design standards will also be revisited, taking the City's Complete Streets Guidelines into account (TranSafe et al., 2018).

- **Evaluation**: Information from network screening in St. Albert can be used to facilitate road safety evaluations, e.g., related to contributing factors to collisions, or to gaps in active transportation routes (TranSafe et al., 2018). Other proposed evaluation

activities include creation of a safety model made up of linked collision and mapping data, and linking collision data and hospital or ambulance data (TranSafe et al., 2018). Finally, evaluations may be conducted to better understand the efficacy of specific activities or pilot projects, such as St. Albert's neighbourhood traffic calming program, curb extensions and speed display signs (TranSafe et al., 2018).

Key partners include St. Albert's Engineering Services, RCMP Traffic Services and Municipal Enforcement Services (City of St. Albert, 2018d). When developing its Transportation Safety Plan, St. Albert looked to Alberta's Traffic Safety Plan 2015, as well as best practices from 11 Canadian municipalities and some international municipalities (TranSafe et al., 2018). St. Albert also aligns its knowledge campaigns with the Province of Alberta's monthly calendar (TranSafe et al., 2018). St. Albert is also a member of CRISP (CRISP, n.d.).

Limited outcomes data are available, with the Plan having just launched in September 2018 (TranSafe et al., 2018). However, since implementing Vision Zero, the program remarks that they have become more evidence-based, are using more sophisticated network evaluations and looking at the performance of the program in a more holistic manner (D. Schick, personal communication, Jul 2, 2019). Parachute will continue to monitor St. Albert's progress towards its goal as more data become available.

What the City has to say

*Interview with **Dean Schick**, Transportation Manager, City of St. Albert*

PARACHUTE: What have been the program's biggest successes so far?

DEAN: In terms of actual impact or influences, protected only left turns has resulted in a 98 per cent reduction. This isn't citywide, but it is along a very specific high-volume, high-speed arterial corridor.

Other than that, we've had success with ventures into the political and public realm where there's an acceptance of our programs. When we implement something like Neighbourhood Traffic Calming, there's a fine line between resident's willingness to trade efficiency and safety in our community. A key component is focusing on data collection and an "evidence-based" approach to mitigation measures and programs; while communicating anticipated impacts – both positive and negative, in a proactive fashion. The fact that we have political support towards Vision Zero and residents respond well to the evaluation information of safety programs has helped promote sustainability of the projects.

When developing the Safety Plan, it was developed from local data and context of information, while incorporating other industry plans for what could best suit our community and what seemed to be working for other cities. Direct public engagement was not a key action of the development of the Plan; however, we incorporated previous public reports of concerns and feedback on traffic safety and anticipated that with the strategies of the Plan, there would be public/stakeholder engagement associated with the delivery of specific strategies. The report is also public and available and used to communicate/reference on projects. One of the biggest benefits was having involvement from all internal stakeholders, e.g., EMS, RCMP, transit... Their take on traffic safety and their input ultimately resulted in something far more holistic. For the most part, there's always some contentious issues, such as traffic calming, but there's a general buy-in, that "we support this and prioritize safety as a community". That was one of the biggest successes.

PARACHUTE: Conversely, what challenges has the program faced? How did you overcome these? Please feel free to focus on one or two significant challenges in your response.

DEAN: Funding. You can have a long list of recommendations that are very impactful, but you need resources to manage the program and staff to manage the data. How will you evaluate, implement new safety features, and apply them network-wide? The public expects you to improve the network and public perception of priorities versus priorities developed by data may not completely align.

There's a demand to make the network safer, and there's such a varying degree of public opinion on what is a priority, what are priority spots. So we are trying to maintain a strong public data bank and share info on the success and inputs of the program. A key component is trying to be as transparent as possible, with strategy and implementation. We celebrate successes, and if we're not successful we evaluate. We don't die on the sword and we don't treat anything as the be all end all, but we adjust.

PARACHUTE: If you had one piece of advice to give to jurisdictions that are contemplating Vision Zero adoption, what would it be?

DEAN: Take the necessary time and allocate appropriate resources - whether it's one person or a team of people, whatever's right for the community - and create a formalized plan. The moment an agency has that, you're making it transparent to all involved how you're going to move your programming forward. That's ultimately how you can be successful in appropriate resource management.

Set realistic expectations. It's difficult for a lot of municipalities to manage expectations from stakeholders. When you talk about your network safety program, you are pulled in a lot of directions. The moment you can be realistic and manage expectations, it will be beneficial and hopefully set a foundation to build additional programs and resources. If you're getting a lot of requests for info, you can explain what your current resource levels are. If it's not a part of your priorities, that doesn't mean it can't be. Use your limited resources for your objectives.

PARACHUTE: What is the "vision" for your Vision Zero program over the next five years?

DEAN: Ultimately reduced injury and no fatalities; with an overall increased confidence and comfort from our residents on traffic safety. Whether it means confidence in letting children walk/cycle to school, a feeling of improved quality of life in their community, or just a confidence that they will arrive home safely from a daily commute; resident satisfaction in their city's transportation network and mobility. We hope at the end of the

day to be reaching our Vision Zero. We never gave any specific measurable targets, because we weren't sure what to say. We left it somewhat open, a "reduction". But I hope to say that over the next five years, we will have zero fatalities, a strong reduction in severe injury incidents, and stay on task, schedule and budget, per our implementation plan. We want to stay focused and evaluate the success of the plan. In five years, we will hopefully have some lessons learned, and do an update of the plan and reevaluate our network and our plan, to meet community expectations and the objectives of Vision Zero.

2.6. Manitoba

Background

The Province of Manitoba is a province of approximately 1.3 million residents, and this is expected to grow to 1,445,700-1,786,600 by 2038, due to a combination of international migration and a positive difference between births and deaths in the province over time (Statistics Canada, 2015a; Statistics Canada, 2015b). In 2018, the province had approximately 1.2 million vehicle registrations, and approximately 2 million new motor vehicle sales were made (Statistics Canada, 2019k; Statistics Canada, 2019w).

In Manitoba, there were 65 fatal collisions and 9,691 injury collisions recorded in 2017 (MPI, n.d.). This resulted in 73 fatalities and 2,468 injuries requiring any type of hospital treatment (MPI, n.d.). The most significant contributor to road injuries based on 2012-2015 data was distracted driving, a factor in an increasing number of collisions year over year (Manitoba & MPI, 2017). Impaired driving is also anticipated to be a key issue on the basis of expected increases in cannabis use and the need for research and surveillance data to inform countermeasures (Manitoba & MPI, 2017). Other issues affecting the province include a significant proportion of road injuries and fatalities taking place in rural areas and an increasing population of elderly drivers (Manitoba & MPI, 2017).

Manitoba has set out its commitment to Vision Zero in the [Manitoba Road Safety Plan 2017-2020](#), i.e., the "Road To Zero" report (Manitoba & MPI, 2017). In its plan, Manitoba describes its approach as "Towards Zero" rather than "Vision Zero" and sets out that "Towards Zero maintains that while not all types of crashes may be prevented, traffic deaths and severe injuries are preventable." This approach is aligned with the SSA, though Manitoba has pointed out that SSA is not a part of any provincial policy (Manitoba, 2017; Manitoba & MPI, 2017).

In the short term, the province will measure success by "an annual downward trending over the next ten years in fatalities and serious injuries per 100,000 population" and "downward trending over the next ten years in the societal cost of collisions in Manitoba on a per capita basis" (Manitoba & MPI, 2017). No concrete numeric targets are provided, but may be developed after data is available from the first three years of the plan (Manitoba & MPI, 2017).

Key features of the plan

The Manitoba Road Safety Plan is organized based on the SSA principles of safe vehicles, safe roads, safe road users and safe speeds (Manitoba & MPI, 2017). However, for comparability, they will be listed by similar headers as other sections.

- **Data collection and analysis**: The critical activities of research and data collection run through the plan (Manitoba, 2017; Manitoba & MPI, 2017). The Province will collaborate with various partners to ensure that data collected are comparable with those from other jurisdictions (Manitoba & MPI, 2017). Another planned activity involves the creation of a centralized database of road safety data which stakeholders, including researchers, will be able to access (Manitoba & MPI, 2017). Currently, Manitoba's collision data is analyzed and reported using two sources: Traffic Accident Report (TAR) data compiled by police, and TARs associated with collision claims compiled by Manitoba Public Insurance (MPI) (MPI, n.d.). This already provides detailed information about number of collisions, severity of collisions, demographics of the parties involved, and more; however, the plan seeks to increase data collection to address collision rates across different modes of transport (C. Eden and G. Matson, personal communications, Jul 25, 2019; Manitoba & MPI, 2017).

- **Education**: Manitoba will undertake public awareness campaigns to facilitate changes to road safety culture, including changes in attitudes towards impaired driving and distracted driving (Manitoba, 2017; Manitoba & MPI, 2017). The province will attempt to address the common practice of speeding in the province (Manitoba & MPI, 2017). The province will also promote correct use of seatbelts and child restraints (Manitoba & MPI, 2017).

- **Enforcement**: Priorities for enforcement will be "the top five dangerous traffic behaviours" as identified by the province and law enforcement. Based on 2017 data this would likely include behaviours such as distracted driving, impaired driving and speeding, which were also the most common factors cited in fatal and serious injury collisions for the year (MPI, n.d.). Effective enforcement measures highlighted in the plan include "visible and consistent police enforcement" for risky behaviours, as well as automated enforcement, which the province seeks to expand (Manitoba & MPI, 2017, p. 22).

- **Engagement**: It is anticipated that municipalities, First Nations representatives and other stakeholders in road safety will be engaged as part of the plan, "when strategic

actions are developed in support of the Plan" (Manitoba & MPI, 2017, p. 29). Public consultation is also expected (Manitoba & MPI, 2017).

- **Engineering**: Engineering takes the form of safe vehicles (e.g., advanced safety features, autonomous vehicles) and safe roads (e.g., designing roads to be more friendly to vulnerable road users, defined to include pedestrians and cyclists; integrating road safety into both new infrastructure and renewal of existing infrastructure in a formalized way) (Manitoba, 2017; Manitoba & MPI, 2017). Speed management will be achieved in part through changes to road designs (Manitoba & MPI, 2017).

- **Evaluation**: In addition to collision statistics reporting, an annual progress report will be produced by the Provincial Road Safety Committee (PRSC) specifically related to the Plan and relevant activities and outcomes (Manitoba & MPI, 2017, MPI, n.d.).

- **Emerging technologies**: A unique feature of the Manitoba Road Safety Plan is that it takes into account emerging technologies and attempts to place these into the road safety landscape. For example, the Plan describes at a high level the perceived safety benefits of autonomous vehicles and attempts to forecast changes that will be needed to enable their operation on Manitoba roads, which will include changes to legislation as well as infrastructure (Manitoba & MPI, 2017).

Key stakeholders for the Vision Zero plan include Manitoba's PRSC comprising representatives from Manitoba Infrastructure; MPI; Manitoba Justice; Manitoba Health, Seniors & Active Living; and Manitoba Association of Chiefs of Police (C. Eden and G. Matson, personal communications, Jul 25, 2019). In addition, the PRSC has established technical working groups focused on priority road safety issues, and these groups include representation from Manitoba Infrastructure; Manitoba Justice; Manitoba Health, Seniors and Active Living; Manitoba Municipal Relations; MPI; City of Winnipeg; Winnipeg Police Service; RCMP; Canadian Automobile Association (CAA) Manitoba; Bike Winnipeg; and Coalition of Manitoba Motorcycle Groups (C. Eden and G. Matson, personal communications, Jul 25, 2019).

Since the release of the Manitoba Road Safety Plan, the technical working groups have put forward a number of diverse recommended action items to the government to address road safety issues (C. Eden and G. Matson, personal communications, Jul 25, 2019). Manitoba's PRSC also plans to engage the City of Winnipeg and other municipalities in

development of municipal road safety strategies to ensure there is alignment with provincial principles, objectives and key success measures (C. Eden and G. Matson, personal communications, Jul 25, 2019). A progress report describing activities from the first year of the Plan has been developed, but is not yet released (C. Eden and G. Matson, personal communications, Jul 25, 2019).

What the Province has to say

*Interview with **Clif Eden**, Manager, Road Safety Programming, Manitoba Public Insurance and **Gary Matson**, Manager, Driver Fitness, Manitoba Public Insurance*

PARACHUTE: What would you consider to be your program's greatest successes or achievements?

CLIF, GARY: Road safety issues are complex in nature and involve a variety of stakeholders from a wide cross-section of organizations and agencies. The greatest success or achievement to-date is the establishment of a Provincial Road Safety Committee (PRSC) which has acted as an umbrella organization to focus the expertise and resources of participating organizations and agencies to achieve mutually agreed upon goals. The activities of the PRSC formed the basis of a well-integrated and comprehensive road safety plan for Manitoba, while respecting the individual mandates and accountabilities of participating agencies. The Committee has guided a more strategic and holistic approach to addressing road safety issues in Manitoba through stakeholder engagement, cooperation and collaboration.

PARACHUTE: Conversely, what challenges has the program faced? How did you overcome these? Please feel free to focus on one or two significant challenges in your response.

CLIF, GARY: The most significant challenge has been maintaining momentum with the initiative through several personnel and leadership changes at many of the key stakeholder organizations.

PARACHUTE: If you had one piece of advice to give to jurisdictions that are contemplating Vision Zero adoption, what would it be?

CLIF, GARY: Vision Zero is a holistic approach to road safety requiring contributions from everyone in the road transport system. It is truly a shared responsibility requiring political commitment, multidisciplinary leadership and community engagement with safety advocate groups. It is critical that collaboration and cooperation occur at each level. Manitoba has seen the initial value Vision Zero can bring to a jurisdiction as it sets a clear timeline for planning, builds political and community commitment and brings together stakeholders to ensure safety for all road users are considered when establishing road safety priorities.

PARACHUTE: What is the "vision" for your Vision Zero program over the next five years?

CLIF, GARY: Despite clear declines in motor vehicle-related casualties in Manitoba, the personal and societal costs of collisions, as well as injuries and fatalities resulting from crashes, continue to be significant.

For Manitoba, our "vision" is to continue to see reductions in fatalities and serious injuries through prioritization of road safety issues, fostering greater cooperation and collaboration among stakeholders, and focusing resources to maximize results.

2.7. Brantford, ON

Background

The City of Brantford had a population of 97,496 based on the 2016 census, and a population density of 1,345.9 per square km (Statistics Canada, 2019a). Based on a 25 per cent census sample, approximately 82.2 per cent of those sampled mainly commuted to work by driving a car, truck or van, followed by 8 per cent who were passengers in these vehicles, making the personal vehicle the primary mode of commuting in Brantford (Statistics Canada, 2019a).

Brantford saw 297 injury collisions and two fatalities resulting from collisions on municipal roads in 2017 (City of Brantford, 2018). This is approximately the same as what had been reported by the Ontario Ministry of Transportation in 2014, a year that saw one fatal and 290 personal injury collisions resulting in one fatality and 397 injured persons (Government of Ontario, n.d.).

Effective Jan 2017, Brantford annexed 2,720 hectares of land from Brant County, rendering some of the earlier statistics potentially out of date (The Corporation of the City of Brantford & County of Brant, 2016). The Official Plan and Transportation Master Plan are in the process of being updated to account for the development of the new land and other factors, which creates an opportunity to revisit the City's road safety strategy (B. Goodger, personal communication, Jul 24, 2019).

In July 2018, Brantford's Council adopted Vision Zero as a means to address road safety (City of Brantford, 2018). Though its Vision Zero plan has not yet been developed, the city is publicly committed to the goal of "zero fatalities or serious injuries" (B. Goodger, personal communication, Jul 24, 2019; City of Brantford, n.d.-c). As of this writing, the City of Brantford website cites the 5 Es of traffic safety as guiding principles (City of Brantford, n.d.-c).

A full list of Brantford's Vision Zero programming is not yet available and an implementation strategy will be tabled for consideration sometime in 2019 (B. Goodger, personal communication, Jul 24, 2019). However, in the meantime, there has at least been one initiative promoting greater cyclist and pedestrian visibility on the road, that was associated with Vision Zero (City of Brantford, 2018). Other planned activities include public education for certain groups of road users including those using mobility devices, engineering changes to pedestrian crossovers, speed limit reductions, and road diets (B.

Goodger, personal communication, Jul 24, 2019). Engineering changes, such as the recent approval of the continuation of the North Park Street road diet pilot project in 2019, are also anticipated to improve road safety (B. Goodger, personal communication, Jul 24, 2019).

A look at Brantford's current road safety programming reveals online educational resources related to safety for cyclists, and practical bicycle safety workshops for children in the community (City of Brantford, n.d.-b). Online advice is targeted to different types of road users including drivers, pedestrians and cyclists (City of Brantford, n.d.-a). The City produces an annual traffic collision report summarized from collisions reports on municipal roads provided by City of Brantford Police Services (B. Goodger, personal communication, Jul 24, 2019; R. Loukes, personal communication, Sep 13, 2019). It is unclear how these will be affected by the Vision Zero implementation plan.

The Vision Zero Road Safety committee consists of Council members and staff, with advisory input from Police Services and anyone who wishes to participate (B. Goodger, personal communication, Jul 24, 2019). Members of a sub-committee called the Active Transportation Sub-Committee has already been defined and will include representation from Council, representation from industry, and community members (B. Goodger, personal communication, Jul 24, 2019).

What the City has to say

*Interview with **Beth Goodger**, formerly General Manager, Public Works, City of Brantford*

PARACHUTE: What have been the program's biggest successes so far?

BETH: The biggest success to date is the simplified vision for road safety, ZERO fatalities or serious injuries on roadways in Brantford. The City has had a number of successes in improving road safety before adopting Vision Zero and going forward it is expected that the initiatives will be easier to implement and communicate through the Vision Zero program.

Some examples of successes that the City has had in reducing collisions at critical locations through geometric changes and traffic operations include:

- Clarence St./Elgin St./Dundas St E. intersection: signal phasing change to eliminate conflicts

- West St./Charing Cross St. Intersection: signal phasing change to eliminate conflicts

- North Park St.: Road Diet to reduce travel lanes and introduce cycling lanes

Radar Feedback Signs have been purchased, an initiative of the former Council Task Force. Ten signs, two per location, are moved on a monthly basis to raise awareness about speeding hot spots.

PARACHUTE: Conversely, what challenges has the program faced? How did you overcome these? Please feel free to focus on one or two significant challenges in your response.

BETH: The biggest challenge is lack of staff time and a dedicated budget to move forward on Vision Zero road safety initiatives. Staff currently try to improve safety through funded capital reconstruction projects. A budget and staffing resources will be developed as part of the Vision Zero Road Safety Implementation Strategy.

The second challenge is public opposition to road safety improvements. A change in approach has been to incorporate a public feedback process, including ward meetings with the support of local councillors. Although this takes more time to implement the

road safety initiative and higher staff involvement, the result has been higher success in implementation and understanding of road safety and balancing the needs of road users.

Another lesson learned was to obtain public feedback through user experience, through the use of pilot projects. The North Park Street road diet was implemented as a pilot and tested for approximately one year. Public input was received through public meetings and adjustments to the final design were made before requesting Council approval to proceed with the changes on a permanent basis. This was possible by taking advantage of the one-year waiting period to place the final lift of asphalt following the reconstruction of the road.

PARACHUTE: If you had one piece of advice to give to jurisdictions that are contemplating Vision Zero adoption, what would it be?

BETH: Patience. Start with small changes to show early success and build momentum. Without the success of the projects initiated before the adoption of Vision Zero, this support from Council would not be possible.

PARACHUTE: What is the "vision" for your Vision Zero program over the next five years?

BETH:

• Report to Vision Zero Road Safety Committee in 2019 with a Vision Zero Road Safety implementation strategy.

• Update of Transportation Safety Committee Mandate & Membership to provide ongoing technical support.

• Formation of the Active Transportation Subcommittee.

• Incorporate Vision Zero strategies, recommendation and policies in the Transportation Master Plan Update for 2021.

2.8. Hamilton, ON

Background

The City of Hamilton has a population of 536,917 per the 2016 census, and a population density of 480.6 square km (Statistics Canada, 2019g). Based on a 25 per cent census sample, approximately 75.9 per cent of those sampled mainly drove a car, truck or van to work, followed by 10.5 per cent who took public transit (Statistics Canada, 2019g). This reliance on the personal vehicle was confirmed by a municipal safety survey undertaken in the same year (Ferguson & White, 2019). It is estimated that 1.1 million trips are made by residents in a 24-hour period (Ashby, 2018).

In 2019, the City of Hamilton released its first Annual Collision Report, which showed that an average of 1,825 injury collisions and 14 fatal collisions were taking place on Hamilton's roads each year between 2013 and 2017 (CBC News, 2019b; City of Hamilton, n.d.). In 2017, the injury and fatality rates per 100,000 population were 313.6 and 3 respectively, which translated into counts of 215 pedestrian injuries, 4 pedestrian fatalities and 138 cyclist injuries/fatalities for the year (City of Hamilton, n.d.).

In February 2019, Hamilton officially adopted a Vision Zero oriented road safety action plan, titled the Vision Zero Action Plan 2019-2025, as part of its Strategic Road Safety Program (SRSP) (D. Ferguson, personal communication, Jul 3, 2019; Ferguson & White, 2019). Hamilton's SRSP, which aims to "eliminate incidents that result in injury or fatality", was re-established in August 2014 with Vision Zero in mind (Ferguson, 2019; Ferguson & White, 2019). The Vision Zero Action Plan 2019-2025 follows the 5 Es of traffic safety, which it describes as "elements of Vision Zero" (Ferguson & White, 2019).

In addition to the 5 Es, Hamilton's Action Plan draws from the Core Principles and Elements defined by the Vision Zero Network, a campaign that seeks to advance Vision Zero among U.S. communities and facilitate networking and knowledge sharing (Ferguson & White, 2019; Vision Zero Network, n.d.). These principles and elements are listed as: political commitment, multi-disciplinary leadership, action plan, equity, cooperation & collaboration, system-based approach, data driven, community engagement and transparency (Ferguson & White, 2019). Within this guidance framework, the new Action Plan proposes varied initiatives under the 5 Es such as dynamic speed boards and a distracted driving and speeding campaign (Ferguson & White, 2019). Secondary emphasis areas for programming focus on users, behaviours and data quality: aggressive driving, intersections, vulnerable roads users, young drivers and

collision data improvements (Ferguson & White, 2019). The Vision Zero Action Plan is anticipated to change as more safety data becomes available (Ferguson & White, 2019).

Key features of the program

- **Data collection and analysis**: Collision data are collected by the Hamilton Police Service through self-reports and motor vehicle reports for more serious collisions; all reports are sent to the City and are manually entered into Hamilton's collision database system (D. Ferguson, personal communication, Jul 11, 2019). Data collected describe frequency of collisions and vulnerable road users affected (Ferguson & White, 2019). According to the program, Hamilton has shifted its approach to network screening over the years, to focus on identifying locations with high injuries or fatalities; an example of a fatal and severe injuries heat map is provided in the Vision Zero Action Plan (D. Ferguson, personal communication, Jul 3, 2019; Ferguson & White, 2019). In the future, Hamilton will provide open data to the public, and this is anticipated to include both raw collision information and heat maps of the city (D. Ferguson, personal communication, Jul 11, 2019; Ferguson, 2019).

- **Education**: So far, the City has facilitated road user education by making safety zone lawn signs available to members of the public, creating the Just Drive Campaign to address distracted driving, raising awareness about yielding behaviours at pedestrian crossovers and supporting the Hamilton Helmet Initiative (City of Hamilton, n.d.; Ferguson & White, 2019). Online resources on a variety of topics are available from the Hamilton Police Service (Hamilton Police Service, n.d.). As part of the new Action Plan, there will be an annual education plan based on enforcement and data analysis outcomes, which may include existing and new messaging (Ferguson & White, 2019).

- **Enforcement**: 24 red light cameras had been installed at Hamilton's intersections as of 2017, and are being expanded at a rate of five new cameras per year; there has also been added enforcement in school zones and an alcohol testing program facilitated by the Hamilton Police Service, "R.I.D.E." (City of Hamilton, n.d.). As part of the new Action Plan, the Red-Light Camera Program will be reviewed, and measures such as targeted enforcement and development of a Traffic Enforcement Unit will also be considered (Ferguson, 2019; Ferguson & White, 2019).

- **Engagement**: When developing Hamilton's Action Plan, a safety survey was conducted among Hamiltonians to probe their opinions about the safety of Hamilton's roads, and public workshops and an open house were also conducted to inform the

plan (Ferguson & White, 2019). In the future, the public will be engaged on Vision Zero through diverse channels such as surveys, community events, interactive web components, and fundraisers; and engagement efforts will also extend to other stakeholders such as other levels of government and the private sector (Ferguson, 2019). Future partnerships with volunteers and Community Road Safety Ambassadors will activate more opportunities to conduct community outreach (D. Ferguson, personal communication, Jul 3, 2019; Ferguson, 2019).

- **Engineering**: Currently, there is a strong emphasis on pedestrian safety in Hamilton. Pedestrian-friendly intersections have been created over the years through the use of pedestrian crossovers, accessible push-buttons, pedestrian countdown signals and ladder crosswalk markings (City of Hamilton, n.d.; Ferguson & White, 2019). Road design features for drivers, such as dynamic radar feedback signs and speed humps, are also being used across Hamilton (City of Hamilton, n.d.; Ferguson & White, 2019). As part of the new Action Plan, it is expected that there will be five priority safety projects identified each year from an engineering perspective; other engineering activities will include review of road maintenance practices, completion of cycling and pedestrian networks, and reviewing design standards with a view towards creating complete streets (Ferguson & White, 2019).

- **Evaluation**: Today, network screening facilitates prioritization of road safety activities in Hamilton based on a combination of risk measurement, frequency of collision types and frequency of collisions at a site (City of Hamilton, n.d.). As part of the new Action Plan, new methods of monitoring Hamilton's transportation network will be considered, and other activities such as video analysis of intersections, field reviews of every traffic fatality and cost-benefit analyses of prospective road safety projects will also be examined (Ferguson, 2019; Ferguson & White, 2019).

Key partners include the Hamilton Strategic Road Safety Committee, a multi-disciplinary and multi-jurisdictional committee affiliated with the SRSP that includes members from the Ministry of Transportation, Hamilton Police Service, Hamilton Public Health Services; and Hamilton's Roads and Traffic, Transportation Planning, and Public Works Communications branches (Ferguson & White, 2019). Additional stakeholders may be engaged for specific project work (e.g., McMaster University's involvement in video analytics of intersections), or to provide advisory capacity for specific stakeholder groups, such as schools or city paramedics (D. Ferguson, personal communication, Jul 3, 2019; Ferguson, 2019).

Since Hamilton's SRSP was re-established in 2014, the program has seen a decline in collisions resulting in injuries by 10 to 15 per cent, and some initiatives that were founded by the program have since become operational activities for the City's Roads and Traffic Division - e.g., pedestrian crossovers, and ladder crosswalks (Ferguson & White, 2019). Initial data from 2019 suggests that the annual count of injury collisions has decreased in 2017 and 2018 (Ferguson, 2019). Parachute will continue to monitor outcomes associated with the new Vision Zero Action Plan as more information is made available.

What the City has to say

*Interview with **David Ferguson**, Superintendent of Roadway Safety, City of Hamilton*

PARACHUTE: What would you consider to be your program's greatest successes or achievements?

DAVID: The success of our various initiatives has seen a decline in injury collisions over a two-year period of 20 per cent, higher if based off the previous trend that was occurring. The ability to utilize revenues from Red Light Camera program has been a great benefit. Additional success would include a reduction of over 50 per cent in injury collisions at intersections with RLCs [red light cameras].

Other success would be our Education Campaigns, in 2018 we won the Provincial Award for Road Safety Initiative of the Year for our Speed Kills Campaign. Approval of our Vision Zero Action Plan took place in February, and Council just approved our Neighbourhood Speed Limit Reduction report (40km/h on local and minor collector roads, 30km/h for school zones).

PARACHUTE: Conversely, what challenges has the program faced? How did you overcome these? Please feel free to focus on one or two significant challenges in your response.

DAVID: Change is the biggest challenge and changing behaviours to the present. Many municipalities have a traffic-operations-first mentality, traditionally that has been how we have operated. But times have changed and more focus is provided on complete and liveable streets, vibrant core areas that encourage pedestrians and cyclists.

The second challenge is the political aspect, working to convince council this is the right decision. In my opinion, communication and education are great tools to overcome these, talking about the effects of motor vehicle collisions, providing statistics on the number of injury and fatal collisions, being out in the public and gaining support for Vision Zero programs and concepts. Use the Vision Zero tools to help address the issues and complaints the councillors are receiving from their constituents. And finally, find a couple of political champions who will help to support your programs and initiatives.

PARACHUTE: If you had one piece of advice to give to jurisdictions that are contemplating Vision Zero adoption, what would it be?

DAVID: There are lots of Vision Zero programs around the world and in North America. Do your homework, don't rush into creating a program without having a true plan and a plan that is achievable. Vision Zero is not a sprint, we will not see a difference overnight, there will be ups and downs, but if you have a plan and stick with it, change will begin to happen.

2.9. London, ON

Background

The City of London, Ontario has a population of 383,822 per the 2016 census, and a population density of 913.1 per square km (Statistics Canada, 2019i). Based on a 25 per cent census sample, approximately 75.3 per cent of those sampled mainly commuted to work by driving a car, truck or van, followed by 9.2 per cent who took public transit (Statistics Canada, 2019i).

In 2018, London saw 11 fatalities on the roads (LPS, n.d.-g). Available data concerning "severe collisions" (fatal and injury) shows that numbers were fairly constant between 2009-2013, hovering between 1,200 and 1,600 (City of London, n.d.-a, p. 4). Key issues for the City based on numbers of severe collisions include collisions at intersections, distracted/aggressive driving, and younger drivers ages 16 to 25 (City of London, n.d.-a).

In May 2017, London's Municipal Council adopted the Vision Zero principles for the City of London (City of London, 2017). The principles were welded to the implementation of the 2014-2019 London Road Safety Strategy (LRSS), which continued to define the City's and Middlesex County's road safety approach (City of London, 2017; M. Elmadhoon, personal communication, Jun 24, 2019). London describes Vision Zero as an "aspirational goal" (City of London, 2017). The six issues covered by the LRSS include intersections, distracted/aggressive drivers, young drivers, pedestrians, cyclists and red light running (City of London, n.d.-a). Each issue is further described in terms of countermeasures; countermeasures follow London's 4 Es of traffic safety which include engineering education, enforcement, and empathy (City of London, n.d.-a).

In the short term, a "non-linear 10 per cent reduction in fatal and injury traffic collisions" was proposed within five years, i.e., by 2019/2020 (City of London, n.d.-a; City of London, 2017). In concrete terms, this would result in a reduction of 155 fewer fatal and injury traffic collisions (City of London, n.d.-a).

Key features of the program

- **Data collection and analysis**: The London Police deliver copies of collision information to the City, including police reports and self-reports, that have occurred in the City of London each day. The Consultant then enters all the relevant data into a Traffic Engineering Software (TES) database (M. Ridley, personal communication, Jul 14, 2019). This data is used to help the city update its road collision statistics, which are

analyzed and monitored against the goal of reducing fatal and injury collisions (M. Elmadhoon, personal communication, Jun 24, 2019). Available data include data regarding collision type, demographics of drivers, and whether vulnerable road users were involved. In the future, London Health Sciences Centre will also contribute emergency department admissions data related to collisions (City of London, n.d.-a). Conclusions from road injury and fatality data analysis were one of the inputs to the LRSS, the others being City input and public feedback as described below (City of London, n.d.-a).

- **Education**: The London Police Service offers online videos for kids related to back to school road safety tips on their website, as well as other online tips for cyclists and drivers with young passengers (LPS, n.d.-c; LPS, n.d.-d; LPS, n.d.-e). Additional road safety tips are available on the Middlesex-London Health Unit website as a component of injury prevention (Middlesex-London Health Unit, 2019). Other education efforts identified in the LRSS include delivering a driver education campaign via Twitter and Young Drivers of Canada training for G1 and G2 drivers (City of London, n.d.-a).

- **Enforcement**: London's Traffic Management Unit leads traffic safety enforcement for the City (LPS, n.d.-g). One of the current focus areas for the London Police Service is community safety, which encompasses traffic management and enforcement "with a focus on distracted, impaired, and aggressive driving, and seatbelt use" (LPS, n.d.-a). An example of the focus areas at work is enforcement of R.I.D.E. checks to identify impaired drivers (LPS, n.d.-f). Enforcement efforts target not just drivers, but also cyclists and pedestrians engaging in illegal behaviours (City of London, n.d.-a).

- **Engagement**: The six focal issues in road safety for the LRSS were selected based in part on the public's feedback; the public was asked to provide their opinion on the overall status of road safety in London, as well as thoughts about nine initial focus areas (City of London, n.d.-a). The London Police Service responds to questions from the public on matters related to traffic legislation, automated enforcement and traffic-related concerns through their website (LPS, n.d.-b).

- **Engineering**: Engineering programs form the bulk of the City of London's Vision Zero countermeasures (City of London, n.d.-a). Areas for future action identified in the LRSS include advanced street name signs ahead of major intersections, roadway alignment improvement, expanding bicycle lanes, installing red light cameras and

putting in place pedestrian refuge islands (City of London, n.d.-a). Areas for further analysis include the need for advanced left-turn phasing and ladder markings at intersections, and visibility and timing of traffic signals (City of London, n.d.-a).

- **Evaluation**: As aforementioned, fatal and injury collisions are tracked and monitored,and can provide an indication of whether the strategy is working (City of London, n.d.-a; M. Elmadhoon, personal communication, Jun 24, 2019).

- **Empathy**: According to the City, "the Empathy approach was introduced to bring awareness of the need for mutual understanding between road users when meeting under conflicting circumstances" (City of London, n.d.-a, p. 2). Many of the aforementioned education campaigns have empathy components as well (City of London, n.d.-a).

Key stakeholders for the LRSS are a part of a steering committee that includes the City of London, Middlesex County, Ontario Ministry of Transportation, London Police Service, Ontario Provincial Police, CAA, Young Drivers of Canada, London Block Parent Program, London Health Sciences Centre and Middlesex-London Health Unit. Other implementation stakeholders include Fanshawe College, Western University, 3M, Young Drivers of Canada, Ontario Provincial Police and the Ministry of Transportation (City of London, n.d.-a, City of London, n.d.-b). The London Middlesex Road Safety Committee (LMRSC) meets regularly to discuss and implement the Road Safety Strategy and Vision Zero activities (M. Elmadhoon, personal communication, Jun 24, 2019). As well, each of the six issues targeted is further supported by its own issue-based working group, coordinated by a lead agency; in some cases, two working groups are assigned to a single issue, representing London and Middlesex respectively (City of London, n.d.-a).

What the City has to say

*Interview with **Maged Elmadhoon**, Traffic & Transportation Engineer and Project Manager, City of London*

PARACHUTE: What have been the program's biggest successes so far?

MAGED: The community has been engaged and responsive to the different road safety programs. Reduction in fatal and serious injury collisions continues to be the target of Vision Zero. In 2018, the City of London won the Transportation Association of Canada (TAC) Road Safety Engineering Award, based on the Vision Zero-London Road Safety Strategy submission. The City and its partners in road safety have put significant emphasis on education tools which proved to be effective in addressing many road safety concerns.

PARACHUTE: Conversely what challenges has the program faced? How did you overcome these?

MAGED: Like most municipal and infrastructure programs, funding and capacity to deliver the road safety counter measures required commitments from all partners in the Vision Zero/Road Safety Strategy. To maximize the potential for success, the choice of Target Areas in road safety was adjusted based on a number of factors, which included the severity of the collisions, the potential effectiveness of the countermeasures and the capacity of the involved agencies to change or add to their current programs to deliver countermeasures specific to the safety strategy.

PARACHUTE: If you had one piece of advice to give to jurisdictions that are contemplating Vision Zero adoption, what would it be?

MAGED: Other jurisdictions can use the goals and results of the London Vision Zero/ Road Safety Strategy, particularly those with similar populations and/or collision experience, to assist them in setting realistic goals and in evaluating the progress of their own actions. Several Vision Zero/Road Safety Strategy education and empathy programs can be transferred or adapted to other jurisdictions, as they use knowledge and resources widely available.

PARACHUTE: What is the "vision" for your Vision Zero program over the next five years?

MAGED: The City continues to build on the success of the current VZ [Vision Zero] / Road Safety Strategy and a multiyear Vision Zero communication plan has been prepared for implementation. An update to the Vision Zero Road Safety Strategy is planned for 2021 with the same goal of reducing fatal and serious injury collisions.

2.10. Toronto, ON

Background

The City of Toronto had a total population of 2.7 million per the 2016 census, and a population density of 4,334.4 per square km (Statistics Canada, 2019t). Based on a 25% census sample, approximately 46.0% of those sampled mainly commuted to work by driving a car, truck or van, followed closely by 37.0% who took public transit; walking also occupied a high percentage at 8.6% of those sampled, making Toronto's roads truly shared ecosystems for different road user types (Statistics Canada, 2019t). It is estimated that 5.1 million trips are made by residents in a 24-hour period (Ashby, 2018).

Within its massive road network that comprises 5,600 km of roads, 900 km of cycling networks, and 26,300 intersections, Toronto regularly experiences road injuries and fatalities (City of Toronto, n.d.). Annual counts of traffic fatalities had increased from 2014 to 2016, from 51 to 77 (City of Toronto, n.d.). The greatest proportions of road fatalities involve pedestrians at 45%, followed by car users at 31% (City of Toronto, n.d.). In 2019, road fatalities continue to be an issue, with 9 pedestrian deaths recorded by March (Pelley & Howells, 2019).

Toronto's commitment to Vision Zero was announced in 2016 and the City's approach was set out in its Toronto Road Safety Plan (TRSP) 2017-2021 (City of Toronto, n.d.; City of Toronto, 2017). The TRSP recognizes the significance of killed or seriously injured (KSI) collisions and focuses on these collisions as the basis of identifying priorities and measuring progress (City of Toronto, n.d.). It uses four headings to organize measures: engineering, enforcement, technology and education (City of Toronto, n.d.). In addition, the TRSP contains six focus areas: pedestrians, school children, older adults, cyclists, aggressive and distracted driving, and motorcyclists (City of Toronto, n.d.; City of Toronto, 2018).

In March 2019, Toronto's Mayor announced his intention to roll out Vision Zero 2.0, which will be based on data gathered on pedestrian deaths in 2018, as well as other sources such as demographic and road environment data, and public opinion (City of Toronto, Toronto Public Health, Toronto Police, TCDSB, TDSB & TTC, 2019; Pelley & Howells, 2019). More details of the new strategy were brought forward in June 2019, and the plan was adopted by City Council in July (City of Toronto, 2019a; City of Toronto, 2019b). Vision Zero 2.0 reaffirms the City's commitment to a target of zero and the Safe System Apporach (SSA), and uses the 5 Es of traffic safety to define countermeasures (City of Toronto, 2019b). Its

primary focuses are: a speed management strategy, road design improvements, proactively addressing high-risk mid-block crossings, proactively addressing turning collisions at signalized intersections, and an education and engagement plan (City of Toronto, 2019b). Within each area of focus, there may be specific tools and actions such as Automated Speed Enforcement (ASE), public education, enhanced enforcement, and lower speed limits on arterials (City of Toronto, 2019b; City of Toronto et al., 2019; Pelley & Howells, 2019). Other countermeasures that do not fall into the above focus areas are also being considered as part of 2.0, such as additional red-light cameras (City of Toronto, 2019b; Pelley & Howells, 2019).

Key features of the program

- **Data collection and analysis**: Data are provided by the Toronto Police, and data analysis was key to identifying issues and priority locations featured in the TRSP (City of Toronto, n.d.). For example, geospatial "heat mapping" was carried out in order to better understand how collisions were dispersed across the city, all together and by focus area population, and to try to identify the causes of any "heat spots" (Browne, 2017). In the future, it is expected that data collection and analysis will be further enhanced through permanent data count stations that will capture road user data (City of Toronto, n.d.). In May 2018, Toronto also initiated an 8-week challenge in collaboration with Ryerson University, allowing those interested in road safety issues to propose data-driven solutions that will help determine where transportation safety measures should be focused (Draaisma, 2018; Pelley, 2018).

- **Education**: Education campaigns planned for Toronto address issues such as pedestrian jaywalking, helmet use for cyclists, legal uses of pedestrian crossovers, and illegal street racing (City of Toronto, n.d.). Safety campaigns will be reinforced through various channels including social media, print media, and the Vision Zero website, and may even take the form of exhibitions (City of Toronto, n.d.; Rieti, 2018). Educational resources targeted to specific age groups are available, e.g., colouring books to promote road safety awareness among school children, or seminars for older adults (City of Toronto, n.d.).

- **Enforcement**: Speed limits in parts of the city are decreasing under the Plan, from 50km/hr to 40km/hr and from 40km/hr to 30km/hr, and further speed reductions are being considered on arterial roads (City of Toronto, n.d.; Moore, 2019). Red-light cameras have also been deployed in some parts of the city (City of Toronto, n.d.). Police will apply enhanced enforcement in a manner that supports the Vision Zero

focus areas, e.g., increasing enforcement in areas used by older adults, or for risky behaviours such as dooring and aggressive motorcycle riding (City of Toronto, n.d.). In addition, Toronto will attempt to work with the Province of Ontario to pilot ASE in the City's school zones and community safety zones, pending approval (City of Toronto, n.d.; Pelley & Howells, 2019).

- **Engagement**: Consultation with the public and with advocacy groups was a key input into the TRSP (City of Toronto, n.d.). Engagement also plays a role in program implementation; an example of this is the "Youth In Control" leadership program from Toronto Public Health which is predicated on peer-based education (City of Toronto, n.d.).

- **Engineering**: Varied road design features will support road safety for all: for example, pedestrians will benefit from features such as pedestrian countdown signals, pavement markings, and amber beacons; while cyclists will be served by features such as separated bicycle lanes and advanced greens at intersections (City of Toronto, n.d.). For motorcyclists, there are efforts to improve the manner in which road safety audits are conducted so that their safety issues are also taken into account (City of Toronto, n.d.). Design changes may be informed by the local population, e.g., longer crossing times near facilities for older adults (City of Toronto, n.d.).

- **Evaluation**: The TRSP proposes to evaluate several of its activities and programs, including its school zones, with a view to making improvements or reducing risk (City of Toronto, n.d.). Evaluation strategies for the Vision Zero school safety zones were presented in 2018, and it is anticipated that this work will serve as a model for developing future Vision Zero evaluations that meet the needs of both policymakers and researchers (CARSP, 2018; Rothman, 2018).

Key stakeholders in developing the TRSP included Toronto Public Health; Sunnybrook Health Sciences Centre; Toronto Police Service; the Toronto Centre for Active Transportation (TCAT); the Disability, Access and Inclusion Advisory Committee; CARP; Cycle Toronto; Walk Toronto; the Rider Training Institute; CAA; Toronto District School Board; and Toronto Catholic District School Board (Browne, 2017; City of Toronto, n.d.). The Vision Zero Road Safety Committee, which meets quarterly to discuss planning and implementation issues associated with the Plan, includes representation from each of these partner agencies (City of Toronto, n.d.). Other partners may be involved in specific improvements, for example, Toronto Hydro's involvement reviewing and enhancing

street lighting at areas at increased risk of pedestrian collisions, or the Toronto Transit Commission's involvement in the "Stay focused stay safe" education campaign (City of Toronto, n.d.).

Since adopting Vision Zero, Toronto Police report that KSI annual counts have decreased from 78 to 66 between 2016 and 2018, though not linearly (Toronto Police & City of Toronto, n.d.). Cyclist KSI counts, however, have increased from 1 in 2016 to 4 in 2018 (Toronto Police & City of Toronto, n.d.). Looking beyond fatal and serious injury collisions, Toronto's efforts may be conveying a sense of safety: for example, TCAT and the Clean Air Partnership conducted an assessment of pilot bike lanes on Bloor Street in 2017, showing that higher proportions of visitors perceived the streets as safe for cycling after the bike lanes were installed (Smith Lea et al., 2017).

2.11. Trois-Rivières

Background

The City of Trois-Rivières has a population of 131,338 per the 2016 census (Statistics Canada, 2019u). Based on a 25% census sample, 87.6% of those sampled mostly commuted to work by driving a car, truck or van, followed by 4.6% who walked (Statistics Canada, 2019u).

The City has formally adopted a Vision Zero goal and is now in the implementation stage (M. Mercure & C. Ferron, personal communication, Jun 26, 2019). Vision Zero in Trois-Rivières will be organized according to ten key measures, including safe and active schools, active transportation for seniors, speed reduction, and safe winter driving (M. Mercure & C. Ferron, personal communication, Jun 26, 2019). Some of the measures, such as police monitoring and education, are well aligned with the 5 Es of traffic safety (M. Mercure & C. Ferron, personal communication, Jun 26, 2019).

Key features of the program

- **Education**: The City will continue to invest in road safety education, which may take the form of outreach campaigns and targeted education for young people (M. Mercure & C. Ferron, personal communication, Jun 26, 2019).

- **Enforcement**: The City will continue to invest in enforcement of the Road Safety Code, which may take the form of funding for police services, road monitoring operations, and targeted monitoring of school areas (M. Mercure & C. Ferron, personal communication, Jun 26, 2019). With respect to speed management, the City has suggested pilot projects of speed limits of 40 km/hr for collector and local streets and speed limits of 30 km/hr for kid-friendly parks and hospital zones, in select neighbourhoods; outcomes of these pilot projects will be used to determine whether coverage will be expanded in the future (M. Mercure & C. Ferron, personal communication, Jun 26, 2019).

- **Engagement**: Citizens were engaged in the development of the key measures for Vision Zero, and will also be involved in the City's road safety commission, see below (M. Mercure & C. Ferron, personal communication, Jun 26, 2019). It has been suggested that a road safety option be added to the "Trois-Rivières 311" mobile app, which would allow the public to document road network issues and contribute to the

quality of city services (M. Mercure & C. Ferron, personal communication, Jun 26, 2019).

- **Engineering**: See earlier observations re: speed limits. Other measures that are being considered include redesigns of sidewalks and chicanes, and improved visibility around certain intersections; as well as snow removal, which also impacts the road environment (M. Mercure & C. Ferron, personal communication, Jun 26, 2019).

- **Evaluation**: Evaluations will be carried out for the pilot projects listed above, and the Vision Zero strategy may be further modified as pilot study outcomes are made available (M. Mercure & C. Ferron, personal communication, Jun 26, 2019).

In respect of key partnerships, the City has set up the Commission de la mobilité durable et de la sécurité routière (translation: Committee of Sustainable Mobility and Road Safety), which will include citizens and partners from different stakeholder groups such as firefighters, public health officers, and local non-profit organizations (M. Mercure & C. Ferron, personal communication, Jun 26, 2019).

Given that limited published information in English is available, a detailed transcript of the broad-ranging discussion of Trois-Rivières' Vision Zero experience with City Councillors Mariannick Mercure and Claude Ferron is presented below.

What the City has to say

Transcript of comments by **Mariannick Mercure**, *Conseillère municipale, District des Forges, Trois-Rivières and* **Claude Ferron**, *Conseiller municipal, district des Rivières, Trois-Rivières*

On the current state of Vision Zero adoption within Trois-Rivières:

MARIANNICK: It is formally adopted! There was a formal report. Last November we put a resolution to a vote. The resolution was adopted, 8 vs 4. The mayor at the time was against it but he left, we went back to election, and the new mayor is also against Vision Zero. The hard part right now is to make the town -

CLAUDE: Make sure that the town will go with the resolution, and will move towards Vision Zero. Even though the new mayor does not fully agree with Vision Zero, we just want to make sure that the whole administration is moving towards it, i.e., implementing the first version of an action plan. Unfortunately, it has become political leverage for some people to attain their goals. Sad that the security of citizens is used in that way.

On communicating the Vision:

MARIANNICK: We have a huge problem with communication and in the end we are trying to deploy it, but it's almost taboo to say "Vision Zero" right now. We are trying to use other terminology.

CLAUDE: There is a clash in the whole population. Many people said, "we don't want it"! But, most people don't even understand what Vision Zero is. When we adopted the resolution, [the city was] proposing different measures, and one of those measures was to put the speed limit between local and collectors' arteries to 40km an hour. Everyone said, "no! We don't want that". That didn't help, because we were just proposing a measure.

MARIANNICK: I think speed is the most emotional part of the debate. The concern of the majority was that the mayor would control the administration. It was not the right way to go about communication. We should have gone with the communication part first, and then adopted Vision Zero. This would have been better, but we didn't have the choice at the time due to the harsh political environment.

On proposed Vision Zero approach and programming:

MARIANNICK: The good thing about Vision Zero is that it's a clear package for the administration to follow. It was somewhat well received by some parts of the administration, but some were "blah" about it; they didn't understand how to move forward. Like many, they were stuck in the mindset of being reactive, instead of being proactive and directing money before there's an accident. It's something we're trying to work through with them.

In what I will send you, we asked the administration to go with the full safe approach system study for the whole town.

CLAUDE: If we want to obtain a different [response] from the upper government, we have to use a systemic approach.

In the meantime, we also want to have some means to reduce speed in the city, we cannot wait 2 years to do something. There are different projects we'd like to put in place in the interim, like the safe school corridors.

On the key stakeholders that Trois-Rivières is working with for implementation:

MARIANNICK: Our commission on road safety includes one representative from provincial public health, and one from a group that works with active transportation. We also have other partners. From the City, we got further with the firemen. Since attending meetings with them, the relation has gotten better.

CLAUDE: There was this whole discussion about how it would affect firefighters' ability to arrive at a site in a certain time. "A firefighter won't be able to get there in time because it's 40km [per hour] in parts of the city!!" Etc. There were some leaks in the newspaper, the messaging went towards something that was false - just to serve their purpose in the end.

MARIANNICK: We had the confirmation of what Claude is talking about here a few weeks ago: the firefighter department presented us with a map showing that 40 km/h on local and collector streets would have minimal impact on their time response. Sadly, this accurate information was not given to the public in an effort to correct the false information leaked earlier.

MARIANNICK: Concerning the partners in the public health sector, Montreal has helped. But, the Transportation Ministry is harder to get in touch with. In Quebec, the transportation department did adopt Vision Zero. We thought they would be there to help

us, but it didn't happen. We did not receive even a word from them. I can't say we managed to establish a connection.

CLAUDE: They adopted Vision Zero as their principle, but they weren't supportive. I think, it was because there was a change in provincial government also.

(Our contacts provided additional information about two of their partners: Roulons Vert and the Public Health Division of Trois Rivieres.)

On consulting public opinion in Trois-Rivières:

MARIANNICK: When the debate was on, we did hear from a lot of community organisations and nonprofit organisations, and lots of people wrote letters in the newspaper.

CLAUDE: ...But most of the letters that were publicised were against! And always, it was around the concept of 40km an hour. Vision Zero was associated with the concept of "40k".

MARIANNICK: We would try to orient the conversation around saving money or saving people's lives, but it's emotional. There's a small group of fairly conservative people.

CLAUDE: Once we've made some mistakes, we can figure out how to go forward. Some of the opponents said, "you should have consulted us before adopting." Well, there's no way we can consult the population on how we can save lives. Can a group of people block a project where the end is to protect more citizens from being hit by cars? That's nonsense to me.

We did go on a consultation, a 2-day roundtable, and different approaches and solutions were raised. The safe systems approach was voiced, and more education, but nothing about infrastructure. This is where Vision Zero stands out. It's a complete approach that works, not just a part of it. But they were focusing on the same strategies: education, and more police officers.

We know Vision Zero is the right thing to do. It has its place and we're convinced about that. Why would it be so different to adopt in Trois-Rivières? [I.e., compared to other jurisdictions]

MARIANNICK: With the mayor that was against the project, that was a big challenge.

Trois-Rivières didn't have a communication department at the time, the communications would mainly go straight to the mayors office. We have changed the structure since and now have a proper department.

On the future of the program:

CLAUDE: The mayor was in place for 15 years or more. If they want to turn left, the system turns left. But we said, there was a security issue... There was no way we could put [our version of Vision Zero] in place.

MARIANNICK: Lots of obstacles have been put in place. Every time we talk about security and safety we're told we cannot put in speed bumps, stop signs...

CLAUDE: Once implementing more Vision Zero stuff, it will be more embedded inside the system, and harder to dismantle.

MARIANNICK: But it still might happen. It will be an electoral issue.

Update: since the interview, a noted real change happened in the organization. Planification to be deployed starting next summer is programmed, including safe school, traffic calming and speed limitation.

On whether zero fatalities and injuries are achievable:

MARIANNICK: Absolutely! It's the ethical goal behind the whole thing.

CLAUDE: I think we're close already. But biggest [barrier] is money, and how to plan the next infrastructure. How do you change what's in place? At some point there's a clash between interests, you have to remove cars to put in space for other road users. That's where you see whether a city is serious about Vision Zero. We're not there yet. Even though people were against 40 km/h, they haven't seen Vision Zero yet, which would involve better equity between all road users. Everyone has the right to move safely in the city.

PARACHUTE: If you had one piece of advice to give to jurisdictions that are contemplating Vision Zero adoption, what would it be?

CLAUDE: Do not propose any specific actions. Put emphasis on pilot projects.

MARIANNICK: Maybe, if you're a smaller town that doesn't have a big team of communication, I think it's a good idea to go with a public relations specialist at the beginning of everything, to guide you through.

CLAUDE: It's good to plan your strategy in advance.

MARIANNICK: In the end we didn't communicate what is Vision Zero. With the consultation what we saw was, people don't know what it is. We haven't moved towards explaining it, with the new mayor. So that's going to be the hard challenge.

2.12. Vancouver, BC

Background

The City of Vancouver has a population of 631,486 per the 2016 census, up 4.6% since 2011, and has a population density of 5,492.6 per square km (Statistics Canada, 2019v). Based on a 25% census sample, approximately 45.4% of those sampled mainly commuted to work by driving a car, truck or van, followed by 29.7% who rode public transit (Statistics Canada, 2019v). The City of Vancouver includes a growing downtown area, strong demand for transit, and an aging population among its own transportation challenges for the next two decades (City of Vancouver, n.d.-j).

Between 2014 and 2018, the City saw annual counts of traffic and motor-vehicle-related fatalities decrease from 16 to 13, averaging 14.2 per year (City of Vancouver, 2019). Pedestrian-related injury collisions have steadily decreased between 2012 and 2014 but are still in excess of 300 per year (City of Vancouver, n.d.-f). Pedestrians and motor vehicle occupants make up the majority of road fatalities at 45% and 42% respectively (City of Vancouver, n.d.-j).

Vancouver's Vision Zero program is guided by the Moving Towards Zero Safety Action Plan, which was introduced in May-Dec 2016 (Brown, n.d.). The program follows the 5 Es of traffic safety though it is not prominently featured in their Action Plan (Brown, n.d., City of Vancouver, n.d.-c). Vision Zero is also cited in and supported by Vancouver's Transportation 2040 Plan, which sets out specific infrastructure improvements and policy suggestions to enhance road safety for different types of road users, such as pedestrians and cyclists (City of Vancouver, n.d.-j). A mixture of long-term and short-term policy directions have been identified to support Vision Zero (City of Vancouver, n.d.-j).

Though no specific target apart from zero is given, Vancouver anticipates that fatal and injury collisions can be reduced by 15-20% through their plan (Brown, n.d.). Additional targets for those action items covered by the Transportation 2040 Plan may also be developed (City of Vancouver, n.d.-j).

Vancouver's target of zero and Moving Towards Zero Safety Action Plan are also referenced in their Walking + Cycling in Vancouver Report Card series, underlining the link between safety and active transportation (City of Vancouver, n.d.-m; City of Vancouver, n.d.-n; City of Vancouver, n.d.-o).

Key features of the program

- **Data collection and analysis**: To implement Vision Zero, the City examined different types of collision, fatality and injuries data, from sources such as the Vancouver Police Department (VPD), ICBC, and Vancouver Coastal Health (VCH) (Brown, n.d., City of Vancouver, n.d.-d). Available data describe severity of injury, types of road users involved, and age of those killed or injured (City of Vancouver, n.d.-a). As part of its strategy, the City plans to look at hospital and ambulance data, which will help to describe injury location, non-motor vehicle collisions, and other significant details (City of Vancouver, n.d.-a; City of Vancouver, n.d.-n). Data are used to inform engineering and enforcement activities, and to identify priority locations for further planning and analysis (Brown, n.d.). In 2018, Vancouver also hosted the VANquish Collisions Hackathon event, which challenged Vancouver residents to come up with their own data-driven solutions for addressing both Vision Zero and active transportation, that the City may further develop (City of Vancouver, n.d.-k).

- **Education**: Vancouver offers education on traffic rules, signs and markings; provides notice to the public about its road safety pilots; and is enhancing driver testing content (City of Vancouver, n.d.-g; City of Vancouver, n.d.-j). It partners with VPD and ICBC to carry out education campaigns (Brown, n.d.). Road user tips are provided on both the City's and the VPD's websites (City of Vancouver, n.d.-f; City of Vancouver, n.d.-l).

- **Enforcement**: Vancouver is enforcing 30 km/hr speed limits on bike routes, and is advocating for municipal control over the rest of the City's speed limits (City of Vancouver, n.d.-j). It is also advocating for bylaws and laws that provide more legal protection to vulnerable road users (City of Vancouver, n.d.-j). It is anticipated that the City and VPD will develop targeted enforcement initiatives (Brown, n.d.).

- **Engagement**: The Transportation 2040 Plan was developed based in part on public input gathered through town halls, workshops and other means (City of Vancouver, n.d.-j). The Plan involves ongoing engagement activities between the City and its partners, including healthcare providers, non-profit organizations and the private sector (City of Vancouver, n.d.-j). A notable example of a recent engagement activity was 2018's public engagement to inform the City's outdoor lighting strategy before it went to Council (City of Vancouver, 2018). Vancouver collects feedback from road users, making changes that are responsive to the outcomes of engagements with them (City of Vancouver, n.d.-e). The VPD's Traffic Support Team also answers traffic-related questions from the public (City of Vancouver, n.d.-i).

- **Engineering**: Recently piloted engineering features include accessible pedestrian signals, leading pedestrian intervals, and pedestrian-activated flashing beacons, and these are either undergoing improvements and/or expansion (City of Vancouver, n.d.-d). The proposed road design changes benefit different types of road users: the Transportation 2040 Plan recommends features such as high-visibility pavement markings, curb extensions, and raised sidewalks for pedestrians; as well as increased space and separated bicycle lanes for cyclists (City of Vancouver, n.d.-j).

- **Evaluation**: The City uses collision data from ICBC and the VPD, as well as hospital and ambulance injury data, to monitor the efficacy of its programming (City of Vancouver, n.d.-a). Some engineering activities are already being evaluated for their impact on road safety outcomes, including pedestrian signals, countdown timers, increased lighting (Brown, n.d.; City of Vancouver, n.d.-d). Activities for monitoring and evaluating Transportation 2040 goals will be developed, including progress reporting and surveys of road users, and there will be flexibility to speed up implementation for road safety measures that are found to be particularly effective (City of Vancouver, n.d.-j).

Stakeholders in Vancouver's Vision Zero include multiple specialized departments of the VPD, the ICBC and the VCH (Brown, n.d.; City of Vancouver, n.d.-b; City of Vancouver, n.d.-h; City of Vancouver, n.d.-i). Specific projects may also result in other stakeholders being involved, such as the Canadian National Institute for the Blind and Access for Sight-Impaired Consumers, both of which were consulted for the City's accessible pedestrian signals program (Brown, n.d.; City of Vancouver, n.d.-d). It is anticipated that "government, academic and private sector partners" will all be engaged in developing evaluation tools associated with Transportation 2040 Plan actions (City of Vancouver, n.d.-j, p. 63). Vancouver has established a Traffic Safety Advisory Group, whose responsibility is to provide multidisciplinary advice around road safety (City of Vancouver, n.d.-e).

In 2017, the City reported that traffic-related fatalities had decreased to 1.9 per 100,000 population based on Vancouver Police Department data, down from 2.2 in the year before (City of Vancouver, n.d.-o). Several road safety interventions, such as LED lighting and countdown timers, had shown promising reductions in pedestrian injury and fatality collisions in the best safety practices toolkit validation leading up to the release of the Action Plan, and further information about ongoing benefits would be valuable from an evaluation perspective (Brown, n.d.; City of Vancouver, n.d.-d). Parachute will continue to

monitor outcomes from Vancouver as more collision data post-December 2016 become available (Brown, n.d.).

2.13. Saskatoon, SK

The City of Saskatoon had a recorded population of 246,376 in the 2016 census, up 10.9% from 2011, and a population density of 1,080.0 per square km (Statistics Canada, 2019o). Of a 25% census sample, approximately 80.4% of those sampled mainly commuted to work by driving a car, truck or van, followed by 6.2% who were passengers in the same vehicles (Statistics Canada, 2019o). As Saskatoon's population continues to grow at a projected rate of 2.5% each year, land use, optimizing transit and fostering active transportation will be two key issues for the City (Urban Systems Ltd. & City of Saskatoon, 2016).

In 2017, eight fatal and 727 personal injury collisions were measured by the Saskatoon Police Service (Saskatoon Police Service, n.d.). The City has reported that 69 fatalities took place and 12,666 people were injured on Saskatoon roads between 2007 and 2016 (City of Saskatoon, 2018a; City of Saskatoon, 2018b). In a 2016 report on unintentional injuries in Saskatoon, the Saskatchewan Health Authority (then the Saskatoon Health Region) found that rural residents of the Saskatoon Health Region had consistently higher motor vehicle injury hospitalization rates per 100,000, adjusted for age and sex, than individuals who lived in Saskatoon (City of Saskatoon, 2018c; Saskatoon Health Region, 2016).

The City's current Traffic Safety Action Plan, which is organized around a set of seven emphasis areas and the strategic approaches of education, engineering, enforcement and legislation, referenced the need for a Vision Zero approach as early as 2013 (City of Saskatoon, n.d.; City of Saskatoon, UoS, & SCETI, 2013). At the time, this was defined as "zero fatal or injury collisions over long term period" (City of Saskatoon et al., 2013). In 2016, the Saskatchewan Health Authority's report also recommended that the City adopt a Vision Zero approach (Saskatoon Health Region, 2016).

In September 2018, Saskatoon's Standing Policy Committee on Transportation agreed to adopt Vision Zero in principle, "committing Saskatoon to become a community with zero transportation-related deaths and severe injuries" (City of Saskatoon, 2018f). A draft project charter was tabled which endorsed an expanded list of 6 Es of traffic safety: engineering, enforcement, education, engagement, equity, and the environment; as well as a seventh principle of "leadership" (City of Saskatoon, 2018e). It is anticipated that the eventual strategy will connect to other city programs and policies such as the Complete Streets Policy and Active Transportation Plan (City of Saskatoon, 2018g).

It is unclear at this time whether any progress has been made past this initial commitment. The Committee requested to see a report in 2019 which will discuss the strategy and resourcing required (City of Saskatoon, 2018f). Collection of collision data was also anticipated to start in early 2019 (City of Saskatoon, 2018e).

Stakeholders that have supported Vision Zero strategic planning or are potential future collaborators include the Saskatchewan Health Authority, Saskatoon Police Service, Saskatoon Public Schools, Medavie Health Services West, Saskatoon and District Safety Council, the Saskatoon Board of Education Driver Education, Greater Saskatoon Catholic Schools, Saskatoon Fire Department and Saskatchewan Government Insurance (SGI) (City of Saskatoon, 2018a). The core Vision Zero Steering Committee will be limited to representatives from the Saskatoon City Council, Saskatchewan Health Authority, Saskatoon Police Service, Saskatoon Public Schools, Greater Saskatoon Catholic Schools, and the City's Transportation and Utilities Department; and may have initiative-specific subcommittees (City of Saskatoon, 2018a; City of Saskatoon, 2018e). In developing its Vision Zero proposal, Saskatoon also looked to select Canadian jurisdictions that have adopted Vision Zero and the specific countermeasures they deployed as part of their programming (City of Saskatoon, 2018d).

Parachute will continue to monitor developments from Saskatoon as more information becomes available about their Vision Zero approach.

2.14. Region of Peel, ON

Background

Peel Region is a municipality of Southern Ontario which encompasses Brampton, Caledon and Mississauga (Region of Peel, n.d.-c). According to the 2016 census, the Regional Municipality of Peel has a population of approx. 1.4 million, up 6.5% since 2011, and the population density was 1,108.1 per square km (Statistics Canada, 2019n). Of a 25% census sample, approximately 74.3% of those sampled mainly commuted to work by driving a car, truck or van, followed by 15.5% by public transit (Statistics Canada, 2019n). It is estimated that 2.5 million trips are made by residents in a 24-hour period (Ashby, 2018). Notably, the median age of the population was the lowest in the Greater Toronto Area at 38.3 years old (Region of Peel, n.d.-a).

By its own account, Peel Region sees approximately 9 fatal collisions and 1,000 personal injury collisions each year (Region of Peel, 2018). In 2010-2014, these injury or fatality collisions mostly occurred at intersections (Region of Peel, n.d.-c). Aggressive and distracted driving were also common causes of these collisions (Region of Peel, n.d.-c).

In Dec 2017 the Region of Peel Council adopted the Vision Zero framework, with a view to bringing a strategic and operational plan to Council in 2018 (Region of Peel, n.d.-c; Region of Peel, 2017). A subcomponent of the plan is the Peel's Vision Zero Road Safety Strategic Plan 2018-2022 (RSSP), which was formally approved in Sep 2018 (Region of Peel, 2018). This plan explicitly addresses action plans for road safety (Region of Peel, n.d.-c; Region of Peel, 2017). Peel's RSSP is fully committed to working towards "zero fatal and injury collisions for all road users" (Region of Peel, n.d.-c). Peel also subscribes to 4 Es of traffic safety, defined as engineering, education, enforcement, and empathy (Region of Peel, n.d.-c).

The Region of Peel has also set one interim milestone: decrease fatal and injury collisions on regional roads by 10% by 2022 (Region of Peel, 2017).

Peel's RSSP is structured around 6 "emphasis areas", or characteristics associated with the largest groups of collisions on regional and local roads (Region of Peel, n.d.-c). These include intersections, aggressive driving (encompassing behaviours such as speeding and tailgating), distracted driving, impaired driving, pedestrian collisions, and cyclist collisions (Region of Peel, n.d.-c). In the RSSP's action plan, each emphasis area is matched to one or more of the 4 Es (Region of Peel, n.d.-c). Altogether, the plan includes

100+ countermeasures that directly counteract the frequency or severity of collisions (Region of Peel, n.d.-c). Countermeasures would then be delivered by the Region or one of its partners (Region of Peel, n.d.-c). While not emphasis areas, truck collisions and school zones are also deemed to be "awareness areas", or additional areas of concern to the community (Region of Peel, n.d.-c).

The RSSP is a component of Peel's long-range transportation plan, which also looks at sustainable transportation, transport of goods, and other topics (Region of Peel, 2017).

Key features of the program

- **Data collection and analysis**: Peel's RSSP is informed by data analyses that look at different factors such as demographic characteristics of collision participants and characteristics of collisions in order to develop appropriate interventions (Region of Peel, n.d.-c). Looking at collision data has helped to identify the Region's emphasis areas (Region of Peel, n.d.-c).

- **Education**: Education countermeasures include activities to improve awareness of at-risk behaviours and safe behaviours; they may also help improve uptake of and mastery of active transportation options as in the case of bike rodeos (Region of Peel, n.d.-c). The Region of Peel website links out to a number of road user resources (Region of Peel, n.d.-b).

- **Enforcement**: Countermeasures related to enforcement include ASE, red-light cameras, "Eliminating Racing Activities on Streets Everywhere" or "ERASE", and "Operation Corridor" (enforcement campaign against aggressive truck driving) (Region of Peel, n.d.-c).

- **Engineering**: Examples of engineering improvements include roundabouts, pavement marking improvements, street lighting improvements, Community Safety Zones, and traffic calming measures such as allowing for on-street parking (Region of Peel, n.d.-c).

- **Empathy**: Peel's definition of empathy involves ensuring that road users recognize each others' needs and experiences (Region of Peel, n.d.-c). Although it falls under the umbrella of education, it is singled out for its importance (Region of Peel, n.d.-c).

- **Engagement**: Stakeholder workshops were used to facilitate the development of the RSSP vision, goal, and emphasis areas; stakeholders included representation from municipalities, enforcement and the province as more fully described below (Region

of Peel, 2018). Additionally, public input helped to identify the "awareness areas" in the RSSP (Region of Peel, n.d.-c; Region of Peel, 2017; Region of Peel, 2018). The Region of Peel has shown an interest in engaging the public through opinion polls and community outreach programs (Region of Peel, n.d.-c; Region of Peel, 2017). As part of the RSSP, a road safety ambassador network will be created that will include interested residents and advocacy groups (Region of Peel, 2018).

- **Evaluation**: Stakeholder discussions about priorities, and evaluation of the efficacy of engineering changes, will continue throughout the life of the RSSP and countermeasures will be measured on an annual basis (Region of Peel, n.d.-c; Region of Peel, 2018). There is latitude to revisit the plan and make adjustments prior to the year 2022 depending on the outcomes shown (Region of Peel, n.d.-c).

Key partners in Peel's Vision Zero plan include Region of Peel, Peel Public Health; the cities of Brampton, Caledon and Mississauga; Regional Municipality of York; Peel Regional Police; Ontario Provincial Police; the Ontario Ministry of Transportation; Mississauga Cycling Advisory Committee, Bike Brampton, and Brampton Cycling Advisory Committee; Road Today; CAA; MADD; MiWay; and Brampton Transit (Region of Peel, 2017). A Vision Zero Task Force will help to oversee the RSSP through activities such as securing funding, conducting research into new interventions, and making periodic adjustments to the Plan (Region of Peel, n.d.-c). This group will include partner agencies listed above, and may in the future include other interested and/or influential stakeholders such as school boards (Region of Peel, n.d.-c). A separate Technical Advisory Committee will deliver countermeasures and will include municipal, enforcement, and provincial representation (Region of Peel, 2018). Finally, one of the objectives of the RSSP will be to interweave safety considerations into municipal decision-making, thereby making the entire region a partner to the plan; this will be facilitated by roles such as road safety ambassadors and paradigms such as the healthy development assessment (Region of Peel, n.d.-c).

Within Peel, Mississauga also adopted Vision Zero in February 2018; however, timelines and details of their plan are yet to be determined (Williams, 2018).

2.15. Halifax Regional Municipality, NS

Background

Halifax Regional Municipality (hereafter "Halifax") has a total population of 403,131 according to the 2016 census, and a population density of 73.4 (Statistics Canada, 2019f). Of a 25% census sample, approximately 70.4% of those sampled mainly commuted to work by driving a car, truck or van, followed by 11.8% by public transit (Statistics Canada, 2019f). The population of older adults is growing, with the number of individuals over the age of 65 set to more than double between 2001 and 2031 (MTPS, HRM, NSHA, & O2 Planning + Design, 2017). A unique consideration when planning for road safety in Halifax is the need for resilient road infrastructure in the face of climate change (MTPS et al., 2017).

From 2012 to 2014, total collisions in Halifax decreased from 8,150 to 7,419, and total fatal and injury collisions decreased from 1,574 to 1,277 (Halifax, 2018a). Though these are improvements, the City has not reached zero fatalities and injuries.

In June 2018, Halifax adopted a Strategic Road Safety Framework for 2018 to 2023, with the objective of moving towards zero road injuries and fatalities by 2038 (D'Entremont, 2018; Halifax, 2018b; Halifax, 2019). Halifax draws a distinction between "Vision Zero" and "Towards Zero"/"Road To Zero": the latter is articulated as recognizing "the reality that zero deaths and injuries cannot be accomplished in the immediate future" (Halifax, 2018a; Halifax, 2018b). Halifax leverages 3 Es of traffic safety - engineering, enforcement, and education - when considering countermeasures (Halifax, 2018b).

Seven emphasis areas were proposed for the Towards Zero initiative (Halifax, 2018a; Halifax, 2018b; Halifax, 2019). These include intersection related collisions, young demographic collisions (<25 years of age), pedestrian collisions, aggressive driving (e.g., tailgating, speeding), distracted driving, impaired driving, and bicyclist collisions (Halifax, 2018a; Halifax, 2019). Along with these seven focus areas, there will be five key action items that serve as a framework for the program: form a safety task force, obtain and implement a data analysis program, implement an outreach program, evaluate existing road safety programs, and implement and evaluate the success of countermeasure programs (Halifax, 2019). As part of the new framework, previous road safety activities involving engineering measures will be reviewed (D'Entremont, 2018; Halifax, 2018a; Halifax, 2018b).

So far, a short-term goal to reduce road injuries and fatalities by 15 per cent within the next five years, i.e., by 2023, has been set, with option to reduce further if the goal is reached (D'Entremont, 2018; Halifax, 2018b).

Key features of the program

- **Data collection and analysis**: Halifax has started to build a collision database; it is expected that this will be linkable to the internal traffic count database in the future, and will be able to generate collision rates (Halifax, 2019). The database will also be able to sort data and generate spatial analyses (Halifax, 2019).

- **Education**: Halifax Regional Police conducts training for its own officers on effective vehicle safety checks, and conducts awareness events for the community (Halifax, 2019).

- **Enforcement**: Monthly themed enforcement efforts by the Halifax Regional Police and the RCMP will continue under the Towards Zero framework (Halifax, 2019). Examples of recent themes include aggressive driving, distracted driving, and motorcycle safety (Halifax, 2019).

- **Engagement**: Halifax has engaged the public and its own stakeholders in developing its Strategic Road Safety Framework, through workshops and online survey questions (Halifax, 2018a).

- **Engineering**: One of the initial steps for the program will be to assess the top 10 fatal and injury collision locations in the city (Halifax, 2019). Deficiencies identified will lead to a proposal for upgrades (Halifax, 2019). A number of previous engineering-related activities will also continue under the new framework; these include speed reduction proposals for the province of Nova Scotia, installing additional rectangular rapid flashing beacons for pedestrian crosswalks, and installing temporary trial infrastructure at locations with high rates of fatal and injury collisions until permanent structures can be funded (Halifax, 2019).

- **Evaluation**: Detailed data analysis and evaluation of year-to-year reductions in fatal and injury collisions are forthcoming activities (Halifax, 2019). However, it is understood that under the guiding principle of "do different and do more", there will be flexibility to review and alter existing countermeasures as the framework is further developed (Halifax, 2018a).

Key partners to the road safety strategy included the Province of Nova Scotia, Nova Scotia Health Authority, Halifax Regional Police, RCMP, Halifax Regional Municipality, Halifax Transit, Child Safety Link, Canadian National Institute for the Blind, Halifax Cycling Coalition, Ecology Action Centre, Crosswalk Safety Society, Halifax Walk n'Roll, Dalhousie University, and Dalhousie Transportation Collaboratory (Halifax, 2018a; Halifax, 2018b). The same partners have committed to being involved in the implementation of the plan and new stakeholders may also be engaged (Halifax, 2018a). A similar group of stakeholders, plus the Nova Scotia Transportation and Infrastructure Renewal, are anticipated to participate in the Toward Zero Task Force (Halifax, 2018a). A Road Safety Steering Committee has also been formed and includes Halifax Regional Municipality staff, Halifax Regional Police; RCMP, Nova Scotia Department of Transportation and Infrastructure Renewal; Halifax Regional Centre for Education; Nova Scotia Health Authority; and the IWK Health Centre; plus ad-hoc subject matter experts (Halifax, 2019).

Although no outcomes data are yet available for the project, it is expected that information reports on the status of the Strategic Road Safety Framework will be presented on an annual basis to the Transportation Standing Committee at the City of Halifax (Halifax, 2019).

Cities, regions, and groups where adoption of Vision Zero is being debated, or is anticipated shortly

2.16. Leduc, AB

Background

Leduc is a city in the south of the Edmonton Metropolitan Region; its population was estimated at 31,130 as of 2017, having more than doubled since 1997 (City of Leduc, n.d.-a; EMRB, n.d.). Based on a 25% sample of the 2016 census, approximately 86.1% of those sampled commuted to work via car, truck or van, followed by 5.3% who rode as a passenger in one of these vehicles, making the personal vehicle the predominant mode of commuting in the City (Statistics Canada, 2019h).

Though 2018 saw no fatal collisions reported in Leduc, there were still 100 injury collisions reported by the RCMP (RCMP-K, 2018). In addition, Leduc has seen counts of motor vehicle collisions causing injury increase between 2013 and 2018 by 147%; a lesser increase occurred in Leduc County (Leduc RCMP Detachment, 2019; Kendall, 2018). Certain locations have been repeatedly identified as the top sites of collisions across 2017 and 2018 (RCMP-K, 2018).

Currently, Leduc's road safety programming is not part of a Vision Zero program, but introduction of Vision Zero is anticipated within 1 year of this writing (C. Chisholm, personal communication, Jul 17, 2019). Based on existing materials, Leduc's program already endorses the SSA and 5 Es of traffic safety (RCMP-K, 2018).

Examples of road safety initiatives currently taking place include ATE leveraging intersection safety devices, bicycle safety clinics, child seat safety checking, traffic hot spot checks, speed management and speeding education, school zone patrols, mandatory alcohol screening (MAS), education on drunk and distracted driving for junior high and high school students, and more (City of Leduc, n.d.-b; City of Leduc, 2018; Leduc RCMP Detachment, 2019; Orr & Kunetzki, 2018).

Key stakeholders in Leduc's current program include Leduc Enforcement Services and the RCMP detachment of Leduc (City of Leduc, n.d.-b; Leduc RCMP Detachment, 2019). There is also a Traffic Advisory Committee that advises the Leduc Council and City Manager on matters related to road safety, and that includes the aforementioned stakeholders (City of Leduc, 2019; Orr & Kunetzki, 2018). Leduc leverages resources such

as School Resource Officers and Community Peace Officers (part of Leduc Enforcement Services) to help deliver education and enforcement initiatives (Leduc RCMP Detachment, 2019).

Leduc is a member of CRISP (CRISP, n.d.).

2.17. Strathcona County, AB

Background

The specialized municipality of Strathcona County (SC) is an urban-rural mixed area in the Edmonton Metropolitan Region, with a population of 98,381 in 2018 (D. Rawson, personal communication, Jun 20, 2019; Hameed, Rawson, & Strathcona County, 2016; Strathcona County, n.d.-b). The population grew 6 per cent between the 2011 and 2016 federal censuses, and continued to grow thereafter, with greater pace of growth in the Urban Service Area than the Rural Service Area (Statistics Canada, 2019q; Strathcona County, n.d.-b). Residents of the area are highly vehicle-dependent, with 1.2 vehicles per licensed driver (Hameed et al., 2016). Of a 25 per cent sample of the 2016 census, 87.5 per cent of individuals commuted to work mainly by driving a car, truck or van, followed by 4.5 per cent by public transit (Statistics Canada, 2019q).

In 2016 (latest year of data), there were five fatal collisions and 558 injury collisions on SC's public roadways, resulting in five fatalities and 64 major injuries (requiring hospitalization) (Hameed et al., 2016). Collisions are a concern in both rural and urban areas: while the number of fatal and major injury collisions increased more in urban areas, rural areas continue to represent approximately 35 per cent of collisions each year and are risky due to higher speed limits (Hameed et al., 2016; Strathcona County, 2018). Thus, there is a need to improve road safety and to carefully balance the needs and interests of both urban and rural residents (D. Rawson, personal communication, Jun 20, 2019).

In 2014, SC laid out its [Traffic Safety Strategic Plan 2020](#) (TSSP), following in the footsteps of the Province of Alberta (Rawson & Narbonne, 2018; Strathcona County, 2014). This plan espouses a "safer systems approach" (Strathcona County, 2014). SC does not consider its Traffic Safety Strategic Plan 2020 a Vision Zero plan (D. Rawson, personal communication, Jun 20, 2019). It uses the language of the safer systems approach (SSA), as the County recognizes that they do not have the community buy-in to implement actions that would be needed to fully implement a Safe System Approach (SSA) (D. Rawson, personal communication, Jun 20, 2019; Hameed et al., 2016; Strathcona County, 2019b). Until they have that capacity, they do not want to use the term Vision Zero and erode belief in the pure model (D. Rawson, personal communication, Jun 20, 2019). The plan proposes 13 short-term and long-term strategies embodying the 5 Es, and with a specific strategy looking at older adults (Rawson & Narbonne, 2018).

The SC TSSP also set two targets, including the target of decreasing the annual rate of fatal and major injury collisions per 100,000 population by 15 per cent in the period 2018-2020 as compared to 2011-2013 (Strathcona County, 2014). The other target is non-numeric: to "work cooperatively with Alberta Transportation staff to improve traffic safety and help meet provincial safety targets" in view of provincial roads in SC (Strathcona County, 2014).

SC's TSSP is supported by the county's Intersection Safety Action Plan, which sets out a further 15 action items in direct support of the TSSP; these actions primarily emphasize engineering and enforcement activities related to arterial road intersections (Strathcona County, n.d.-a).

Key features of the program

- **Data collection and analysis**: RCMP data for reportable crashes that result in injury or fatality on SC's public roadways were previously manually entered into SC's Traffic Crash Location System, but are now being fed automatically by Alberta's Provincial E-Collision reporting system (D. Rawson, personal communication, Jun 20, 2019; Hameed et al., 2016; Rawson & Narbonne, 2018). On an annual basis, SC uses its data to report rates and counts of fatalities, major injuries, and minor injuries stratified by factors such as road user type, age, cause and time of day or year (Hameed et al., 2016). SC also maps collision data regarding fatalities and major injuries and analyzes the road network for factors such as speed, volume and noise (Hameed et al., 2016). All of this information feeds into engineering and enforcement strategies and facilitates evaluation (Rawson & Narbonne, 2018).

- **Education**: Through its Traffic Safety Communication Plan, SC has set out a central framework for road safety messages (Rawson & Narbonne, 2018). Communications also include outreach via Facebook and Twitter (Rawson & Narbonne, 2018). Some traffic safety educational materials, e.g., related to rural driving, are available on SC's website (Strathcona County, 2018). Within the community, an "Option 4" program is offered to previous traffic offenders who wish to receive education about their offences instead of paying a fine (Strathcona County, 2019a).

- **Enforcement**: SC's enforcement activities include traffic stops and commercial vehicle safety assessments (Rawson & Narbonne, 2018). One type of enforcement service in SC is the Neighbourhood Traffic Safety Initiative, which consists of heightened enforcement in a particular neighbourhood (Rawson & Narbonne, 2018). Another

example of enforcement is the implementation of an application process for work activities that affect road right-of-way and/or require traffic control, promoting safer work zones (Rawson & Narbonne, 2018).

- **Engagement**: SC collected public opinion information on traffic safety in 2015 and 2018 (Rawson & Narbonne, 2018). The 2018 online survey revealed that a higher percentage of respondents felt that traffic safety in SC was good compared to in 2015; however, there was also increasing tolerance of risky behaviours such as speeding (Rawson & Narbonne, 2018).

- **Engineering**: New arterial roads are subject to road safety audits and collision data is being used to identify where infrastructure improvements should take place for existing roads (Rawson & Narbonne, 2018). In-service road safety reviews have been conducted on areas with high crash risk, and some resultant recommendations have already been applied (Rawson & Narbonne, 2018). As well, traffic calming measures were installed in certain neighbourhoods (Rawson & Narbonne, 2018). Finally, an Intersection Safety Action Plan will guide the design of intersections (Rawson & Narbonne, 2018). Examples of specific safety features that have been installed in SC include intersection safety devices, protected left turns on certain roads, driver feedback signs displaying road speed, shark's teeth yield lines and rectangular rapid flashing beacons (Rawson & Narbonne, 2018; Strathcona County, 2019d).

- **Evaluation**: As new data is collected each year, progress against the original strategies and targets will be assessed (Rawson & Narbonne, 2018). SC also compares its own results to those of other municipalities, such as St. Albert and Edmonton – that have formally adopted Vision Zero – in order to determine whether they are on trend (Rawson & Narbonne, 2018).

Key stakeholders include the Traffic Safety Advisory Committee, a group of elected officials and citizens that convenes roughly monthly and whose core members support Council on matters related to traffic safety planning (Strathcona County, 2019c). Other stakeholders include multiple County departments (e.g., Transportation and Agriculture Services, Transportation Planning and Engineering, Planning and Development Services, Enforcement Services), as well as SC's Integrated Traffic Unit, which includes Community Peace Officers, RCMP, and Provincial Sheriffs (Rawson & Narbonne, 2018). SC works with residents and schools on school-related traffic safety initiatives (Rawson & Narbonne, 2018). For specific initiatives, there may also be other partnerships struck, such as a

seasonal collaboration with Shell Canada in 2017 for the distribution of pedestrian safety lights (Rawson & Narbonne, 2018). Finally, SC also works with the province of Alberta and Alberta Transportation for road safety matters, including provincial highway safety and meeting provincial safety targets (Rawson & Narbonne, 2018; Strathcona County, 2014). SC is also a member of CRISP (CRISP, n.d.).

Since the launch of the 2014 TSSP, SC has published some outcomes data: the average annual rate of fatal and major injury collisions more than doubled between 2011-2013 and 2015-2017 to 35 per 100,000 population on county roads, putting the County further away from its TSSP goal (Rawson & Narbonne, 2018). Notably, both absolute numbers of major injury collisions and major injury collision rates per 100,000 population on all county roads increased year over year between 2014 and 2016; the number and rate of fatal collisions remained largely stable (Hameed et al., 2016). Despite these data, SC continues its commitment to the "safer systems" principles and continues to work towards zero (Rawson & Narbonne, 2018). More recently, the County has started to use "safe systems" language more openly in its external facing materials (D. Rawson, personal communication, Jun 20, 2019).

What the County has to say

*Interview with **Debbie Rawson**, Transportation Integration and Safety Advisor, Strathcona County*

PARACHUTE: What would you consider to be your program's greatest successes or achievements?

DEBBIE: Our successes include our Neighbourhood Traffic Safety Action Plan, which is a step towards implementing design changes necessary to create a Safe System. The County now has a program integrated with our residential rehabilitation program, where we are automatically implementing physical pedestrian safety upgrades at all of our school, playground and trail crossings, without going through any public traffic calming processes. Residential rehabilitation includes installing physical improvements like curb extensions and pedestrian beacons anywhere certain conditions are met. This is helpful since traditionally, traffic calming required a great deal of public engagement. These changes are resourced through our annual rehabilitation program, so it is a much more cost-efficient process for us and it frees up our traffic safety budget to be used in other areas.

There are a couple other things: from an engineering perspective, the Intersection Safety Action Plan has also addressed. For example, under what circumstances we implement protected left turn phases at our intersections. This is helpful as there is resistance against reducing the efficiency of intersections. Having a consistent, defendable warrant process for the implementation helps manage and reduce push back. To date, ongoing evaluation has shown on average a 78 per cent reduction in left turn collisions.

As well, the ISD [intersection safety device] guideline helps us with capacity building and eventually, can help rebuild trust with the community that these tools are being used in a data driven, safety-focused way.

PARACHUTE: Conversely, what challenges has the program faced? How did you overcome these? Please feel free to focus on one or two significant challenges in your response.

DEBBIE: Politically, we don't have the environment at this time to implement a complete Safe Systems Approach or to use the terminology "Vision Zero" because there's such pushback and uncertainty in our municipality. Edmonton has done amazingly well with

their Vision Zero program, but in many ways, people boil down Vision Zero to "a lot of photo radar". Edmonton has been aggressive and successful in that, but it also gets people's hackles up.

Originally, we were very optimistic about our ability to implement the measures in the Traffic Safety Strategic Plan, as it was passed unanimously by Council. But as projects like traffic calming were implemented, there has been some pushback from the public and politicians. It's been a very good learning curve for us.

PARACHUTE: To elaborate, is there anything that you've found works well for building and maintaining partnerships in the face of pushback?

DEBBIE: I would go back to the strategies I mentioned above, where we have implemented clear, evidence-based approaches to the implementation of controversial initiatives (like ISDs and protected left turn phases). When asked why we are using them, all team members have clear, consistent replies that focus on safety benefits of the devices.

PARACHUTE: If you had one piece of advice to give to jurisdictions that are contemplating Vision Zero adoption, what would it be?

DEBBIE: There needs to be buy-in and belief in the program at all levels, in our engineering departments, senior administration and Council level, before you move forward. In our municipality, almost everybody sees traffic risk on residential roads and there are many requests for enforcement. But at the end of the day, we have an excellent safety record in our neighbourhoods: 59 fatalities in the last 10 years on our arterial roads, and only one residential. The bulk of collisions are on our arterial roads, but residential is where we are hearing the most feedback. We are a very service-oriented municipality so we'll respond, but we need people to understand where the real traffic safety issues are in our community and support the changes necessary to effect safety improvements.

Another piece of advice is, making sure you're truly employing a team approach and team process, and having some councilor representatives on your Vision Zero board. It's invaluable to have support on council; Councillors who are going to be champions for the program and actively support it.

PARACHUTE: What is the "vision" for your Vision Zero program over the next five years?

DEBBIE: Everything I spoke to will continue to go forward. Something I haven't mentioned is we have the planning and development department on board. Many of our problems were the result of past planning decisions that encouraged separated land uses and vehicle-oriented design. Today's planners have a lot of pressure to increase density and walk-ability, so when we now look at our growth nodes and standards, we are trying to design roads to a lower speed so that our new neighbourhoods have that traffic calming in place already and arterial roads integrate safer intersection designs. Then we do not face the challenge of playing catch-up.

Right now, we're still trying to build acceptance and understanding (internal, external and resident), and once we feel we have the understanding and support, we will try to upgrade to a true Vision Zero plan. We are not sure if this will be in a year, or five years...

2.18. North Bay, ON

Background

The City of North Bay had recorded a population of 51,553 in 2016, decreasing 3.9 per cent from 53,651 in 2011 (Statistics Canada, 2019l). According to a 25 per cent census sample, approximately 76.3 per cent of the population mainly commuted to work by driving a car, truck or van, followed by 8.5 per cent who walked (Statistics Canada, 2019l).

In September 2018, North Bay City Council moved to endorse a Vision Zero framework (Bortolon, 2018). This follows from an earlier engagement in June 2016, when Parachute presented on Vision Zero to North Bay communities; and from the Oct 2016 formation of the North Bay Vision Zero subcommittee, a division of the Road Safety Committee that would advise the City's Engineering Department to ensure alignment with the Vision Zero plan (Parachute, 2017b). A "soft approval" to pursue Vision Zero was given in 2017, and City Council endorsed a framework for North Bay Vision Zero in Sep 2018 (Parachute, 2017b; Bortolon, 2018; City of North Bay, 2018).

Development of a five-year action plan is underway and so the program is not considered to be in implementation at this time (P. Cliché, personal communication, Jul 21, 2019). Although a detailed description of North Bay's approach is not yet available, this plan is expected to address reducing traffic-related fatalities and serious injuries, using a data-driven approach, and the 5 Es of traffic safety will play a role (P. Cliché, personal communication, Jul 21, 2019). Aside from the action plan, a Road Safety Strategy will also be needed, to identify the most important traffic safety issues in North Bay (P. Cliché, personal communication, Jul 21, 2019).

Preliminary programming suggestions include allowing pedestrians more time to cross streets, and eliminating right turns on a red light (Young, 2018). Heat maps were also being worked on as early as 2017 (Parachute, 2017b).

Key stakeholders and participants on the current Vision Zero steering committee include the City of North Bay, North Bay Parry Sound District Health Unit, District of Nipissing Paramedic Services, North Bay Collision Centre, North Bay Fire and Emergency Services, Ontario Ministry of Transportation, North Bay City Police, Ontario Provincial Police, Connecting Community Partners in Injury Prevention Committee (CCPIP); and the

Ontario Injury Prevention Resource Centre (OIPRC), funded by Public Health Ontario and operated by Parachute (OIPRC, n.d.; Parachute, 2017b). Community engagement was also considered (Bortolon, 2018). Working relationships between community partners and organizations will be strengthened as part of the Vision Zero action plan (P. Cliché, personal communication, Jul 21, 2019).

What the City has to say

*Interview with **Pat Cliche**, Chair North Bay & Area Road Safety/Vision Zero Committee*

PARACHUTE: What would you consider to be your program's greatest successes or achievements?

PAT: I think our greatest success has been to get Vision Zero enforcement from city council. This is a big step to get a whole municipality to agree to use this very important platform and lens to create safer roads for our citizens.

PARACHUTE: Conversely what challenges has the program faced? How did you overcome these? Please feel free to focus on one or two significant challenges in your response. (To recap, in your last interview with us, you had mentioned data collection and funding were two significant issues.)

PAT: Funding is always an issue since only a few partner agencies at the table can help support the work financially. Our current need is to secure funds to be able to have a consultant(s) to help lead the action plan development. The cost for this type of work is very high and even higher for communities within Northern Ontario since the consultant usually must travel and therefore has additional costs for mileage, hotel, and food.

Another challenge is the staff time that organizations can commit to the project. As agencies have less budget and more work, it takes time away from this type of work because it is seen as less essential for many organizations (i.e., police can't have staff sit at meetings when not enough officers to do enforcement).

Commitment from the Engineering Department of the City to involve Vision Zero in the process at the beginning and to at least look at suggestions from Vision Zero and to respond back to the Committee when a suggestion is submitted.

PARACHUTE: If you had one piece of advice to give to jurisdictions that are contemplating Vision Zero adoption, what would it be?

PAT: My advice would be to make sure you have a strong partnership table that represents all 5 Es of the Vision Zero strategy as well as members that have time to give to developing plans for activities and not just be at meetings.

PARACHUTE: What is the "vision" for your Vision Zero program over the next five years?

PAT: Since our vision and mission will be part of our action plan process, I wouldn't want to give an answer that is solely my opinion and not what the committee envisions – but when we are looking at Vision Zero we have to ensure that any efforts we provide may prevent injuries and save the lives of people in our community.

2.19. Ottawa, ON

The City of Ottawa is in the process of developing their 2020-2024 Road Safety Action Plan. Once adopted, the plan will be the third-generation plan for the City, guided by the theme of "Think Safety, Act Safely". Following the principle of a safe systems approach to road safety, it focuses efforts and resources where they are needed most to have the greatest impact on reducing collisions resulting in serious injury or death. More details to follow in a future case study.

2.20. County of Grande Prairie, AB

The County of Grande Prairie No. 1 has a population of 22,303 per the 2016 census, up 13.1 per cent since 2011, and a population density of 3.8 per square km (Statistics Canada, 2019e). According to a 25 per cent census sample, 93.8 per cent of those sampled drove while 3.2 per cent rode as a passenger to work in a car, truck or van, making the personal vehicle the prevailing mode of commuting in the county (Statistics Canada, 2019e).

Grande Prairie had voiced its endorsement of Vision Zero principles as early as 2017 (CGP1, 2017). The County attempted to adopt Vision Zero principles formally in 2017 after employees attended an Alberta Traffic Safety Conference and heard about Vision Zero initiatives (S. Gerow, personal communication, Jul 29, 2019).

Currently there are various road safety initiatives taking place in the County and City of Grande Prairie, such as new pedestrian crossing signs with flashing beacons, ATE, and enforcement and education programs that concentrate on flagging parking violations around school zones in September (City of Grande Prairie, n.d.-a; City of Grande Prairie, n.d.-b; CGP1, 2017). It is unclear if these will come together under a singular Vision Zero plan or be revisited. Related, the County's Transportation Master Plan sets out that the County will review its road design standards, invest in transportation infrastructure updates, and attempt to collect more detailed collision data in collaboration with the RCMP and Regional Enforcement Services (CGP1, n.d.-b).

Because limited published information is available regarding the County of Grande Prairie's experience with Vision Zero, our interview with our contact in the Sign Program (a division of Public Works principally responsible for creating and maintaining road and address signs) is presented in detail, below (CGP1, n.d.-a).

What the County has to say

*Interview with **Shawn Gerow**, Sign Shop Lead, County of Grande Prairie*

PARACHUTE: Were there any success stories that came out of your experience with Vision Zero? E.g., programs that were continued, targets that were met, or outputs that were produced...

SHAWN: In 2017, we installed flashing pedestrian crosswalks into our largest hamlet. Since 2016 we have upgraded close to 1,000 signs on our roadways in the effort to make them more visible. Our enforcement department is also engaged in education and enforcement efforts by utilizing Transportation's Traffic Safety Calendar and initiatives.

Recently our staff have been working with AB transportation on amending the Traffic Safety Act to include speed reductions for vulnerable highway workers (i.e., maintenance, plow trucks, tow trucks, tire trucks, etc.). We continue to improve our signage and when possible are engineering, designing, and maintaining our roadways to account for the human factors of driving and subsequently reduce incidents.

PARACHUTE: Conversely what challenges did the program face, if any? Please feel free to focus on one or two significant challenges in your response.

SHAWN: Adoption of the Vision Zero principles have not been without challenges. To our knowledge we are the sole County in our region that has been working to adopt Vision Zero, and due to our size and workload, we have been unable to make significant strides towards the principles (in relation to larger urban centres such as Edmonton/ Calgary). With Parachute's involvement in Vision Zero we have seen a reduction in communications and some networking challenges, as we had been affiliated with members working with AB traffic supply who had direct involvement in Vision Zero previously.

PARACHUTE: If you had one piece of advice to give to jurisdictions that are contemplating Vision Zero adoption, what would it be?

SHAWN: Our advice to other areas looking to adopt Vision Zero principles is that as a small municipality it may be difficult to implement on your own, but collectively we can all hope to make a difference when it comes to road safety. Continue to look for opportunities to get involved.

2.21. Windsor, ON

The City of Windsor has a population of 218,645 (City of Windsor, 2018). Based on a 25 per cent sample of the 2016 census, 81.6 per cent of those sampled in Windsor mainly commuted to work by driving a car, truck or van, followed by 6.7 per cent who rode in the same vehicles (Statistics Canada, 2019x).

In 2017, the City saw five fatal collisions and 1,412 injury collisions, based on reportable collisions tracked by the Windsor Police Service (City of Windsor, 2018). Annual counts of injury collisions in Windsor have been trending upwards, from 904 in 2014 to 1,412 in 2017, and the five-year-average rate per 1,000 population was 6.98 in 2013-2017, compared to the provincial average of 3.99 in 2009-2014 (City of Windsor, 2018). Collision risk factors that are particularly prevalent in Windsor include distracted driving and drivers that had alcohol exposure before driving (City of Windsor, 2018).

In 2019, Windsor's city council heard comments from representatives of the Windsor Bicycling Committee, Ford City Neighbourhood Renewal and Bike Windsor Essex recommending the development in a Vision Zero policy; thereafter, the city's Environment Transportation & Public Safety Standing Committee requested a draft Vision Zero policy and a gap analysis be developed (City of Windsor, 2019). Prior to this development, the City was also asked to consider Vision Zero in 2018 (Georgieva, 2019).

Limited information is available regarding the status of Vision Zero in Windsor at this time.

2.22. Winnipeg, MB

Background

The City of Winnipeg has a population of 705,244 per the 2016 census and had grown 6.3% since 2011; its population density is 1,518.8 per square km (Statistics Canada, 2019y). Of a 25% census sample, approximately 70.0% of those sampled mainly commuted to work by driving a car, truck or van, followed by 14.9% by public transit (Statistics Canada, 2019y).

The City's Annual Collision Report, based on MPI-reported collisions data, indicates that 11 fatal collisions and 5,589 injury collisions had taken place in 2017 (City of Winnipeg, n.d.). Fatal collisions had decreased since 2012 but not linearly, while injury collisions had shown increases every year since 2012 (City of Winnipeg, n.d.). Six out of 11 fatalities in 2017 involved pedestrians, while rear-end and intersection 90-degree collisions were responsible for the majority of injury collisions (City of Winnipeg, n.d.).

In January 2017, Winnipeg's Standing Policy Committee on Infrastructure Renewal and Public Works tasked the Winnipeg Public Service with creating a road safety strategy founded in "Towards Zero" (City of Winnipeg, 2018). In Jan 2018, an informational report was submitted to the Standing Policy Committee outlining the high-level theoretical framework for the plan (City of Winnipeg, 2018). However, it appears the plan was not completed, and that the work is being repurposed for the overall transportation master plan; thus, it is unclear whether that plan will also have a "Towards Zero" orientation or when it will be delivered (Glowacki, 2019).

Winnipeg espoused a "Towards Zero" approach, which it described as "based on an international best practice called Vision Zero" and aligned with Safe System Approach (SSA) (City of Winnipeg, 2018). "Towards Zero" has its roots in the CCMTA's Road Safety Strategy 2025, and the details of how Winnipeg's definition of Towards Zero differs from Vision Zero are not fully clear (City of Winnipeg, 2018).

Initial priority areas were identified through an analysis of 2012-2015 road injury and fatality data where collisions took place on Winnipeg city streets (City of Winnipeg, 2018). These include:

- Research and data collection - data sharing between data partners, so that additional analyses can take place. Today, Winnipeg collects robust data regarding time and date

of crashes, crash configuration, road conditions, and demographics of participants, but limited information regarding pedestrian and driver actions (City of Winnipeg, n.d.; City of Winnipeg, 2018).

- Safe roads - road safety reviews, infrastructure and design improvements.

- Safe road users - enforcement technologies and increasing enforcement capacity for drug impairment.

- Safe speeds - speed management strategies.

(City of Winnipeg, 2018). Current programming, which include activities such as road safety audits, protected left turn signal phases at specific intersections, and installation of design measures such as curb extensions and raised crosswalks, as well as enforcement activities, will continue under the new plan (City of Winnipeg, 2018; City of Winnipeg, 2019a).

Current partners of the City in road safety initiatives include the City's Public Works Department, Winnipeg Police Service, MPI, and Manitoba Hydro (City of Winnipeg, 2018, City of Winnipeg, n.d.). Winnipeg also deploys an independent audit team to carry out its road safety audits (City of Winnipeg, 2019b).

For more information regarding Winnipeg's strategy, refer to the Manitoba Road Safety Plan 2017-2020 (Manitoba & MPI, 2017).

Public Health Units or Groups advocating for Vision Zero

2.23. Southwestern Public Health, ON

Background

Southwestern Public Health (SPH) is an Ontario Public Health Unit (PHU) comprising three regions: City of St. Thomas, Elgin County and Oxford County (SPH, n.d.-b). It was created through the combination of two PHUs, Elgin St. Thomas Public Health and Oxford County Public Health, in 2018 (SPH, n.d.-b). Altogether, the townships represent approximately 200,000 residents (SPH, n.d.-b).

Stakeholders representing Oxford County have started to discuss adoption of Vision Zero (M. Lichti, personal communication, Jul 10, 2019). Although SPH's website features messaging that is compatible with Vision Zero and SSA, i.e., that "road safety is everyone's responsibility" (SPH, n.d.-a), this is not equivalent to formal adoption by Oxford County or other communities.

Road safety is a recognized issue in Oxford County: Between January 2014 and June 2018, there were 26 fatal motor vehicle collisions on Oxford County roads with most occurring on rural roads (M. Lichti, personal communication, Jul 10, 2019). As the county's population and employment (and by extension, commuting volumes) are expected to increase over the next 2 decades, additional efforts are needed to ensure that all people can get around safely (PTS, LC & Oxford County, 2019). Impaired driving from alcohol and other sources has also been recognized as a public health issue in the County, with Woodstock and Tilsonburg reporting higher rates than the rest of Ontario (Macleod & Deroo, 2018).

Oxford County currently has limited public-facing educational materials related to road safety, mostly related to winter driving (e.g., Oxford County, n.d.; Oxford County, 2015). A forthcoming road safety strategy in 2020 may reveal more about the county's planned activities (M. Lichti, personal communication, Jul 10, 2019). In the meantime, a draft transportation master plan for the next 2 decades points to possible engineering and enforcement changes such as ASE and a speed management policy (PTS et al., 2019). Analysis and yearly review of collision data are also planned, and a preliminary analysis has already revealed the most at-risk urban and rural intersections in the County (PTS et al., 2019).

Because Oxford County is in the very early stages of adoption with limited published material related to Vision Zero, our interview is presented in detail, below.

What the Public Health Unit has to say

*Interview with **Meagan Lichti**, Public Health Nurse, Injury Prevention and Built Environment, Southwestern Public Health*

PARACHUTE: Tell us about the Oxford Road Safety Committee (ORSC). How and when did the conversation around Vision Zero start?

MEAGAN: I started talking about Vision Zero after learning about it doing a situational assessment in 2016/17. I would discuss the concepts at our cycling advisory meetings where I had some county and city engineering present as well as local councilors. I formed the ORSC this year once there was a plan for a road safety strategy in our updated Transportation Master Plan (TMP). Our two police departments had teamed up last summer for "Operation Zero" where they quoted Sweden's Vision Zero so I knew they were buying into the concept. I wanted to keep the momentum moving but bring all the stakeholders together.

We wanted to call it a Vision Zero task force or steering committee, but we did get a little bit of push-back about Vision Zero from the county, so we stuck with the generic name of road safety committee This committee includes inspectors from each police department, and a manager level employee at Oxford County with public works. This is the group that will hopefully be more of the decision makers, and oversee the development of a comprehensive road safety strategy.

There is still some confusion at the engineering level regarding the difference between an engineering strategy and a road safety strategy based on Vision Zero Principals. I think all the partners still need more education about the key elements of Vision Zero and how to embed them into a local strategy. I also want to have a good understanding of the principals and the specific pieces from a public health perspective that I want to ensure make it into the strategy.

PARACHUTE: Why is Vision Zero a compelling framework for your jurisdiction and what are the types of issues that you think it is well positioned to help address?

MEAGAN: I feel like our rural roads are deadly roads. Traffic is travelling at high speeds and there is no simple solution to this issue. Oxford County had been a rural leader in adopting concepts such as zero waste and zero poverty, so I thought they may also be interested in Vision Zero. I also believe it supports safer roads for active transportation

and equitable access to our transportation system which is very important from a health perspective.

PARACHUTE: What are some of the enablers of adoption in your jurisdiction? What are some barriers?

MEAGAN: Re: enablers, I think Oxford County's commitment to sustainability intersects well with Vision Zero ideals. They have targets within their sustainability plan such as "Develop accessible intercommunity transportation options to reduce reliance on personal automobile ownership." These types of targets can be achieved through the equitable lens of Vision Zero. Active transportation and climate change are a focus for the county and public health. We have interested and engaged citizens on our cycling advisory committees, and our TMP mentions a road safety strategy and a cycling strategy. Our police departments are committed to the concept as demonstrated through their partnership program of operation zero.

One of our towns, Ingersoll, has achieved bronze status as a cycling town or city [from the Share the Road Cycling Coalition*], and are in discussions about applying for silver. I have heard at conferences some discussions about tying the Share The Road application together with Vision Zero. There was a section in the application for silver that looked at "whether Vision Zero was being considered in your community".

Those are potential enablers. We are treading carefully and trying not to get a huge resistance though as most of our residents are very reliant on cars.

Re: barriers, there was some hesitation about Vision Zero being an unrealistic goal at the county level. There was concern about negative feedback in the press about the strategy and that other local municipalities such as Waterloo region specifically chose not to go the route of vision zero language. I think Hamilton had just announced a strategy and there was some negative press about it, and that made our county partners concerned. Also, most of the people on board are cyclists, but because we're very rural and car dependent, there could be some hesitation or negativity around that as well. No matter what we do, we have to accommodate a car. Even when it comes to commuting for work, this county is not urban enough and we don't have enough good public transportation options. We're never going to get rid of the personal car here, but we can put some more emphasis on other modes. Funding for the strategy is also a concern. With increased funding obligations on municipalities they are more reluctant to take more on.

PARACHUTE: Since you started the conversation, have there been any noteworthy changes? E.g., in terms of perceptions or attitudes around Vision Zero within the County?

MEAGAN: I believe there is still a lack of understanding around what Vision Zero really means, and how it is different from the regular engineering approach. There are more people talking about Vision Zero though, and our new group appears to be very supportive of the idea and continues to discuss the development of the strategy. The strategy development has been delayed by a year but there is still commitment so that is positive.

PARACHUTE: If you had one piece of advice to give to jurisdictions that are contemplating Vision Zero adoption, what would it be?

MEAGAN: Don't ignore the political side. Get politicians and citizens on board from the beginning so they can advocate for this.

*For more about Share The Road Cycling Coalition, see (SRCC, 2019).

2.24. Timiskaming Health Unit, ON

Background

Timiskaming Health Unit (THU) is an Ontario PHU that includes offices in New Liskeard, Kirkland Lake, and Englehart (THU, n.d.-a; THU, n.d.-b). The PHU has a population of 33,049 according to the 2016 census, and a population density of 2.3 per square km (Statistics Canada, 2019s). Of a 25% census sample, approximately 80.9% of those sampled mainly commuted to work by driving a car, truck or van; the next most popular modes were walking and riding as a passenger in the aforementioned vehicles, at 7.5% each (Statistics Canada, 2019s). The PHU has many ongoing public health activities oriented to transportation, including the promotion of active transportation via the Share the Road education campaign, CAN-BIKE bicycle training, and other community initiatives (THU, n.d.-a).

Internal stakeholders are contemplating adoption of a Vision Zero plan (K. Oviatt, personal communication, Jul 11, 2019). The PHU publishes limited road safety messaging on its website under the umbrella of promoting active communities, which also encompasses active transportation and healthy diet; however, such road safety messaging is primarily related to public education, and Vision Zero messaging and shared responsibility for road safety have not yet been formally explored (THU, n.d.-a; THU, n.d.-b).

Because THU is in the very early stages of adoption with limited published material related to Vision Zero, our interview with our contact at the Kirkland Lake branch of THU is presented in detail, below. Readers are also encouraged to review our profile of Temiskaming Shores, a municipality comprised of the communities of Haileybury, New Liskeard and Dymond, and sits on the Timiskaming Board of Health (City of Temiskaming Shores, n.d.; THU, n.d.-a).

What the PHU has to say

*Interview with **Krystal Oviatt**, Public Health Promoter, Timiskaming Health Unit*

PARACHUTE: Please describe at a high-level what Vision Zero looks like among communities in the Timiskaming Health Unit. If there are differences between the different communities in terms of stage of adoption and/or implementation, please so state.

KRYSTAL: Vision Zero has not been formally adopted by any of our communities. We are working with one municipality more closely on a couple of road safety initiatives, and so our tagline for that is "working towards Vision Zero". While the initiative of Vision Zero has not been adopted by the municipal council yet, some of the Vision Zero principles have been taken on in various departments e.g., Public Works.

Our local Timiskaming District Road Safety Coalition has adopted Vision Zero as a practice we would like to promote. We have formed a dedicated subcommittee who will help move this work forward.

Our plan is to approach the municipalities in the district and encourage them to adopt and implement Vision Zero. As a district, Timiskaming is rather small, but all of our municipalities have varying mixes of rural and urban, which would have varying needs. Our hope would be that municipal councils will adopt the Vision Zero principles, and those features would be implemented little by little as road infrastructure projects come up, and aligning the principles with already adopted strategies/mandates of each municipality.

PARACHUTE: Have you heard anything in the way of public opinion?

KRYSTAL: In working with the City of Temiskaming Shores on a pedestrian safety campaign as well as an education campaign on sharrows, we have had mixed feedback. Some very positive comments about the campaign itself and actions taken by the municipality, and other comments that provided an opportunity for more education about safety and active transportation.

PARACHUTE: How long has your Vision Zero program been active? And, how was Vision Zero brought up in your committee?

KRYSTAL: The Road Safety Coalition adopted Vision Zero as a best practice to promote in September 2018, but just more recently have we formed a dedicated sub-committee to move the work forward. Our area also has a strong advocacy group called "Going the Extra Mile for Safety (GEMS)" that is championing a 2+1 highway concept for Northern Ontario; this is also a Vision Zero solution to highway traffic fatalities.

PARACHUTE: What issues do you discuss at the committee?

KRYSTAL: As the Timiskaming District Road Safety Coalition we discuss local road safety concerns and run educational campaigns and programs that promote school bus and school zone safety, construction safety, off-road safety as well as distracted and impaired driving. As a dedicated sub-committee group, at this point, our discussions have focused on planning for municipal adoption.

The District Road Safety Coalition was formed in 2014 with the merging of the Temiskaming and Kirkland Lake coalitions; the group has been active since 2001. At the table we have the Ministry of Transportation of Ontario, the Ontario Provincial Police, school board travel consortia, school bus operators, public works for tow municipalities, as well as some active and passionate community members.

PARACHUTE: What are the goals of your program at a high level? I realize you might not have a lot of data right now to inform strategy...

KRYSTAL: We are pursuing data sharing with the OPP and the hospitals for data specifically related to injuries, and where specifically collisions are happening. These might include fender benders or more serious collisions. We're working to see what can be shared. We don't have a trauma centre in our district, to be able to see what the high-risk roads and intersections are and which locations we can we work on. While the majority of the collisions occur on the highway, and not in municipalities, our goal will be get people moving safely and encouraging active transportation.

PARACHUTE: What major activities are you undertaking to meet your goals? Between now and the end of year or whenever the proposal is delivered, are you mostly just looking at gathering data?

KRYSTAL: We are actively gathering data, as well as preparing for municipal presentations for adaption. We have worked closely with the City of Temiskaming Shores

on two educational campaigns, pedestrian safety and sharrows, in which we have tagged "Working towards Vision Zero" to help get that branding out to the public.

PARACHUTE: Were there unique contextual factors that you needed to take into account for planning road safety in Timiskaming Health Unit, and if so can you please describe what these were?

KRYSTAL: Our district is unique in the fact that we have a lot of different municipalities that are very dispersed. We're trying to promote active transportation, but our district is built in a more car-centric way, just because things are so far apart. In this respect, we need to focus on the needs of each municipality, their strengths and areas of opportunity.

PARACHUTE: What would you consider to be your program's greatest successes or achievements?

KRYSTAL: We've been able to put two educational campaigns together. We have had collaboration with municipal partners – an already established relationship, but that might make it easier when we're ready to ask, "can you truly support Vision Zero"? I think that's a success.

PARACHUTE: Conversely what challenges has the program faced? How did you overcome these? Please feel free to focus on one or two significant challenges in your response.

KRYSTAL: The challenge is that most of our data regarding where serious injuries are occurring are to do with the highway, which is not our jurisdiction, so we need to continue to advocate for road safety with the Ministry of Transportation to improve our highways.

Another challenge, would be the very nature of our district in that there are multiple small communities. Getting each municipality on board with Vision Zero will be time intensive and will require slightly different approaches, it is not a one size fits all regional approach.

3. Discussion

Vision Zero efforts may not look the same or take the same course in each jurisdiction. It is our hope that through a discussion of the diversity of Vision Zero programs across Canada, we have facilitated a better understanding of how to approach Vision Zero in your unique jurisdiction. The learnings from various road safety stakeholders shared in this case study can help you to prepare for a variety of challenges that may arise throughout the consideration and implementation of a Vision Zero and/or Safe Systems Approach to improving road safety. Whether you are just learning what Vision Zero is, are advocating for Vision Zero in your area, or are actively in the phase of considering or implementing Vision Zero, learning from the experiences of other jurisdictions can help you plan effectively and progress your road safety efforts forward.

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Appendix 2: Acronyms

ASA: Associated Engineering Alberta Ltd.

ASC: Alberta Safety Council

ASE: Automated Speed Enforcement (see also ATE)

ATE: Automated Traffic Enforcement (see also ASE)

BCRSS: BC Road Safety Strategy

CAA: Canadian Automobile Association

CARSP: Canadian Association of Road Safety Professionals

CCMTA: Canadian Council of Motor Transport Administrators

CCPIP: Connecting Community Partners in Injury Prevention Committee

CGP1: County of Grande Prairie No. 1

CRISP: Capital Region Intersection Safety Partnership

EMRB: Edmonton Metropolitan Region Board

EPS: Edmonton Police Service

ERW: Engage Region of Waterloo

FS: City of Fort Saskatchewan

GEMS: Going the Extra Mile for Safety

GRSP: Global Road Safety Partnership

HRM: Halifax Regional Municipality; also "Halifax"

ICBC: Insurance Corporation of British Columbia

ISLELS: ISL Engineering and Land Services

KSI: Killed or Seriously Injured

LC: Lura Consulting

LED: Light-Emitting Diode

LPS: London Police Service

LRSS: 2014-2019 London Road Safety Strategy

MADD: Mothers Against Drunk Driving

MPI: Manitoba Public Insurance

MTPS: McPhail Transportation Planning Services Ltd.

MTSF: Memorial & Traffic Safety Fund

NSHA: Nova Scotia Health Authority

OIPRC: Ontario Injury Prevention Resource Centre

OPP: Ontario Provincial Police

OPS: Ottawa Police Service

OTSE: Office of Traffic Safety – Edmonton, Canada

PHU: Public Health Unit

PRSC: Manitoba's Provincial Road Safety Committee

PTS: Paradigm Transportation Solutions Limited

RCMP: Royal Canadian Mounted Police

RCMP-K: RCMP - "K" Division Leduc Detachment

RLC: Red Light Camera

RSSP: Region of Peel's Vision Zero Road Safety Strategic Plan 2018-2022

SC: Strathcona County

SPH: Southwestern Public Health

SRCC: Share the Road Cycling Coalition

SRSP: Hamilton's Strategic Road Safety Program

SSA: Safe System/Systems Approach (as distinct from Safer Systems)

STEP: Selective Traffic Enforcement Program

TAC: Transportation Association of Canada

TAR: Traffic Accident Report

TCAT: Toronto Centre for Active Transportation

THU: Timiskaming Health Unit

TIRF: Traffic Injury Research Foundation

TRSP: Toronto Road Safety Plan

TSACC: Temiskaming Shores & Area Chamber of Commerce

TSSOP: Region of Peel's Transportation Safety Strategic and Operational Plan

TSSP: Strathcona County's Traffic Safety Strategic Plan 2020

VCH: Vancouver Coastal Health

VPD: Vancouver Police Department

VZ: Vision Zero

WCG: Watt Consulting Group

WRA: World Road Association

See also abbreviations and codes for provinces:

https://www12.statcan.gc.ca/census-recensement/2016/ref/dict/tab/t1_8-eng.cfm
(Statistics Canada, 2016)

Appendix 3: Additional Tools and Resources

Canadian Motor Vehicle Traffic Collision Statistics

https://www.tc.gc.ca/eng/motorvehiclesafety/resources-researchstats-menu-847.htm

Canada's Road Safety Strategy 2025

https://roadsafetystrategy.ca/files/RSS-2025-Report-January-2016-with%20cover.pdf

CCMTA Road Safety Measures

https://roadsafetystrategy.ca/en/road-safety-measures

Map of known Vision Zero jurisdictions in Canada

https://parachute.ca/en/professional-resource/vision-zero-collection/