ISSUE / REVUE
01
MARCH
2020
MARS

CARSP ACPSER
Canadian Association of Road Safety Professionals
L'Association canadienne des professionnels de la sécurité routière

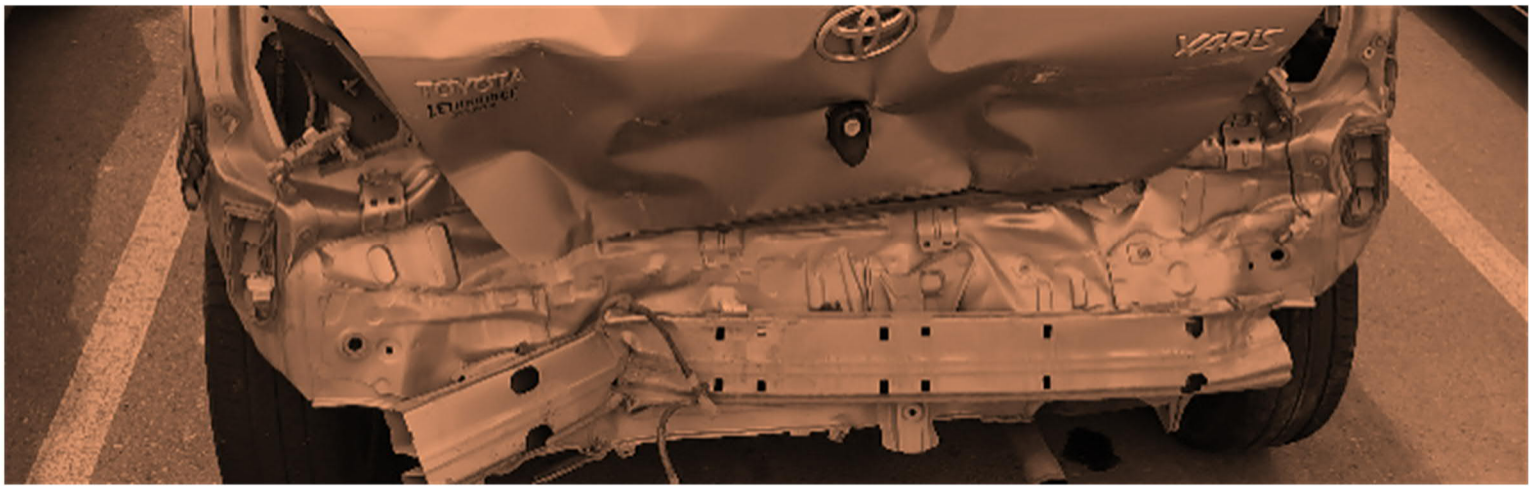
The Safety Network
Le Réseau-Sécurité

this issue

cette revue

LE JOURNAL TRIMESTRIEL DE L'ASSOCIATION CANADIENNE DES PROFESSIONNELS DE LA SÉCURITÉ ROUTIÈRE

QUARTERLY JOURNAL OF THE CANADIAN ASSOCIATION OF ROAD SAFETY PROFESSIONALS



Editorial

On Friday, September 13, 2019, while waiting at a stop bar for the signal to turn green, I was struck from behind by a vehicle doing approximately 60 km/h (that's my Yaris above).

The next 7 days were very different for me. I have no recollection of the 2 hours immediately following the collision. I was swiftly processed through our health care system, shuffled to a larger centre hospital for a scan, was diagnosed with whiplash and a concussion and allowed to go home.

I remained in a foggy and forgetful state for a couple days. I had to take the week off of work, sleep a lot, fill out forms at the police department, report the collision to the insurance company, shop around for and buy a new car. I'm still visiting the mass age therapist and chiropractor due to persistent pain in my lower back.

I was lucky that when I was struck and was pushed into the intersection there was no cross-traffic. It could have been a lot worse. I'm sure many of you can tell of similar stories of having been involved in collisions. The driver who struck me claimed he was looking in his rear-view mirror trying to track a motorcycle changing lanes.

I know what you're all thinking… …"yeah, right". Who knows. Maybe he was texting, maybe he wasn't. It is quite possible; even *probable*. Was there something *we* could have done to prevent this collision? I'm grateful to be a part of a community of professionals who share the same goal of making that drive home from work to our loved ones *uneventful*. Whether it be through engineering, education or enforcement – thank you all for what you do.

Chris Poirier
Chief Editor

Éditorial

Vendredi le 13 septembre 2019, alors que j'attendais au barre d'arrêt pour que le signal passe au vert, j'ai été heurté par derrière par un véhicule faisant environ 60 km/h (c'est ma Yaris ci-dessus).

Les 7 jours suivants ont été très différents. Je ne me souviens pas des 2 heures suivant la collision. J'ai été rapidement traitée par notre système de soins de santé, transférée à un hôpital d'un centre plus grand pour une analyse, j'ai été diagnostiquée avec un coup de fouet cervical et une commotion cérébrale et permettée à retourner chez moi.

Je suis resté dans un état brumeux et oublieux pendant quelques jours. J'ai dû prendre une semaine de congé, dormir beaucoup, remplir des formulaires au service de police, signaler la collision à la compagnie d'assurance, magasiner et acheter une nouvelle voiture. Je visite toujours le massothérapeute et le chiropraticien en raison de douleurs persistantes dans le bas du dos.

J'ai eu de la chance que lorsque j'ai été frappé et poussé dans l'intersection, qu'il n'y ait pas eu de circulation transversale. Cela aurait pu être bien pire. Je suis sûr que beaucoup d'entre vous peuvent raconter des histoires similaires d'implication dans des collisions. Le conducteur qui m'a frappé a affirmé qu'il regardait dans son rétroviseur en essayant de suivre une moto qui changeait de voie. Je sais à quoi tu penses tous… "oui, mon oeil"! Peut-être qu'il envoyait un texte, peut-être pas. Il est fort possible; même *probable*. Y avait-il quelque chose que nous aurions pu faire pour empêcher cette collision?

Je suis reconnaissant de faire partie d'une communauté de professionnels qui partagent le même objectif de rendre le retour du travail à nos proches *sans incident*. Que ce soit par l'ingénierie, l'éducation ou l'application de la loi - merci à tous pour ce que vous faites.

Chris Poirier
Rédacteur en chef

Learning From The Best: Lessons From British Columbia's International Road Safety Symposium

Abstract

Road trauma is a health epidemic. In British Columbia (BC), approximately 300 people die and 4,000 people are hospitalized in road traffic crashes every year. (1) These tragedies are not "accidents"; they are predictable and, most importantly, they are preventable. (2) In February 2019, BC held its first Vision Zero Summit in the City of Surrey. This successful event highlighted further need for knowledge exchange, partnership building and frank discussion about the challenges and politics we face to keep British Columbians safe on our roads.

In response, the British Columbia Centre for Disease Control partnered with the University of British Columbia Bureau of Integrated Transportation Safety and Advanced Mobility and held a highly successful International Road Safety Symposium on November 7th & 8th, 2019. The symposium invited speakers from the Netherlands, Australia and Canada to speak on topics such as vehicle speed management, cyclist and pedestrian safety, use of road safety data, and how to tackle the increases in deaths and serious injuries we are seeing on our roads.

Résumé

Le traumatisme routier est une épidémie de santé. En Colombie-Britannique (C.-B.), environ 300 personnes meurent et 4 000 personnes sont hospitalisées chaque année suite à une collision routière (1). Ces tragédies ne sont pas des «accidents»; ils sont prévisibles et, surtout, ils sont évitables (2). En février 2019, la Colombie-Britannique a tenu son premier sommet Vision Zero dans la ville de Surrey. Cet événement a réussi à mettre en évidence la nécessité d'un échange de connaissances, de l'établissement de partenariats et d'une discussion franche sur les défis et les politiques auxquels nous sommes confrontés pour assurer la sécurité des Britanno-Colombiens sur nos routes.

En réponse, le British Columbia Center for Disease Control s'est associé au Bureau de la sécurité des transports intégrés et de la mobilité avancée de l'Université de la Colombie-Britannique et a organisé un symposium international sur la sécurité routière les 7 et 8 novembre 2019. Le symposium a invité des conférenciers des Pays-Bas, de l'Australie et du Canada afin d'adresser des sujets touchant la sécurité routière tels que la gestion de la vitesse des véhicules, la sécurité des cyclistes et des piétons, l'utilisation des données de sécurité routière et la manière de lutter contre l'augmentation des décès et des blessures graves que nous constatons sur nos routes.

Left to right: Dr. Simon Washington; Dr. Ezra Hauer; Dr. Fred Wegman; Dr. Tarek Sayed; Dr. Ben Beck; and Ms. Megan Oakey | Photo Credit: Samantha Bruin

Road Safety Challenges in the Smart Mobility Era

Dr. Tarek Sayed, Distinguished Professor with the Department of Civil Engineering at UBC and Tier 1 Canada Research Chair in Transportation Safety and Advanced Mobility, presented on automated safety analysis using computer vision techniques.

Dr. Sayed conducts automated safety analysis using computer vision techniques, traffic conflict techniques, pedestrian and cyclist modeling, and Intelligent Transport Systems (ITS) in order to make safety evaluations.

He recognizes that in the world of road safety, we are "data rich and understanding poor". His work is focused on helping to correct this.

Dr. Sayed's transportation engineering research focuses on three main areas: 1) to improve road safety analysis and evaluation techniques, 2) to improve the level of knowledge associated with the safety implications of traffic operations and highway design, and 3) developing and evaluating ITS to increase the efficiency of traffic.(3)

From Birth to Recovery – The Public Health Approach to Road Trauma

Dr. Ben Beck, Deputy Head of Prehospital, Emergency and Trauma Research at Monash University, Australia, situated road trauma within a broader public health perspective. He elaborated on the underlying societal reasons for the "fatal five" (speeding; seat belts; drunk / drug driving; fatigue; and distraction (4)), and the importance of land use planning and urban planning to reduce reliance on private motor vehicle use. He elaborated that the key barrier to active transport is perceived safety.

Dr. Beck demonstrated how post-crash care within the health system has brought about high-quality and rapid prehospital trauma care, transport to trauma centres with specialist care, and timely and appropriate rehabilitation. Yet, only a small proportion of patients return to pre-injury levels of function. And finally, that transportion is a determinant of health that contributes to the existence, persistence, and sometimes widening of health inequities within and between cities.

Put simply, increasing dependency on vehicles has led to increasing unfairness.

Evidence-Based Road Safety Management – What Yields True Road Safety Benefits?

Dr. Ezra Hauer, Emeritus Professor, Department of Civil Engineering, University of Toronto, began his presentation with a quote from the 2016 Ontario Road Safety Annual Report: "Ontario's roads continue to be among the safest in North America." He questioned why the report applauded the roads rather than the drivers and presented the 'benevolent answer', which is that drivers cause crashes, and the 'malevolent answer', which is that admitting drivers are safe would mean less money spent on roads.

He discussed crash causation and prevention, weighing the road-user centered approach against the safe systems approach (6).

Safe Systems Approach: Critical Success Factors

Dr. Fred Wegman, Emeritus Professor, Traffic Safety at Delft University of Technology, Netherlands, described the safe systems approach as dealing with the 'environment' of the road user: the road, the vehicle, technology, regulation and legislation, etc. The aim is to eliminate or at least substantially reduce dangerous behaviours resulting in crashes.

Until now, we have inherited an inherently unsafe road safety transport system, and the main approach has been to add risk reducing measures (without limiting individual freedom too much) delivered by government via regulation and compliance (7). In future, we ought to be improving road safety by investing in the Safe System Approach, finding new mechanisms for compliance, and using technology. Further, there is a need to leave the road safety silo and engage with other agendas, such as climate change.

Road User Distraction

Dr. Simon Washington, Professor and Head of School, Civil Engineering, University of Queensland, Australia, described his recent experience as a court expert for a case involving distracted driving and billboards.

Billboards are often rented and leased to ad agencies by the transport authority, generating substantial revenue, a portion of which is devoted to funding road safety investments.

Advertisers would never pay for these roadside billboards if drivers did not look at them; however, until there is hard evidence that crashes are increasing due to billboards, the jury is out. Dr. Washington elaborated on distracted driving and his recent research on texting and driving. Despite a six times higher likelihood of crashing, many drivers do not perceive texting and driving to be dangerous (8). Over the course of two days, participants grappled with the paradigm shift posed by the Safe System Approach and Vision Zero. The solutions do not lie in trying to change humans since humans will always be fallible.

The research is clear: we must build a system around us to protect us. Such a road system includes lower speed limits, barriers to prevent head-on collisions, and better intersection design.

Increasing partnership work between health, engineering, municipalities, the Insurance Corporation of British Columbia, police and government, and other jurisdictions, is critical to make health gains and to garner political will.

By Denise Beaton, BC Centre for Disease Control and Megan Oakey, BC Injury Research and Prevention Unit

Denise Beaton joined the BC Centre for Disease Control and the BC Injury Research and Prevention Unit in 2018 as Provincial Coordinator for Injury Prevention, with 8 years' experience working in academic research, as well as in the non-profit and private sectors. Denise works in collaboration with the Provincial Manager for Injury Prevention, coordinating multiple projects, supporting team efforts with internal and external partners on ongoing projects and initiatives.

Megan Oakey joined the BC Centre for Disease Control and the BC Injury Research and Prevention Unit in 2016 as Provincial Manager for Injury Prevention, with 15 years' experience working in public health in Canada, Australia, Cambodia, Kenya and Tanzania. Megan is the current co-chair of the BC Provincial Public Health Injury Prevention Committee, which provides guidance and recommendations on injury prevention to the Provincial Public Health Executive Committee, the Ministry of Health and the Provincial Health Officer.

References

1) Piedt, S., Rajabali, F., Barnett, B., & Pike, I. (2015). The BC casebook for injury prevention. BC Injury Research and Prevention Unit: Vancouver, BC.

2) RoadSafetyBC (2016). Moving to Vision Zero: Road Safety Strategy Update and Showcase of Innovation in British Columbia. Victoria, BC.

3) Zheng, L. & Sayed, T. (2019). Bayesian hierarchical modeling of traffic conflict extremes for crash estimation: A non-stationary peak over threshold approach. *Analytic Methods in Accident Research, 24* https://doi.org/10.1016/j.amar. 2019.100106

4) Salmon, P.M., Read, G.J.M., Beanland, V., Thompson, J., Filtness, A.J., Hulme, A., McClure, R., & Johnston, I. (2019). Bad behaviour or societal failure? Perceptions of the factors contributing to drivers' engagement in the fatal five driving behaviours. *Applied Ergonomics, 74*, 162-171.

5) Beck et al. How much space do drivers provide when passing cyclists? Understanding the impact of motor vehicle and infrastructure characteristics on passing distance. Accident Analysis & Prevention, 2019; DOI: 10.1016/j.aap.2019.03.007

6) Tingvall et al (2019). Recommendations from the Academic Expert Group regarding a second Decade of Action for Global Road Safety. Swedish Transport Administration, TRV 2018/24495.

7) Academic Expert Group (2019). Saving Lives Beyond 2020: The Next Steps. Recommendations from the Third Global Ministerial Conference on Road Safety.

8) Oviedo-Trespalacios, O., Haque, M., King, M. & Washington, S. (2018). Should I text or call here? A situation-based analysis of drivers' perceived likelihood of engaging in mobile phone multitasking. *Risk Analysis.*

CARSP/PRI 2020 Joint Road Safety Conference COVID-19 Update

To: Current and potential delegates of the CARSP/PRI 2020 Joint Road Safety Conference

CARSP and PRI, and its partner agency TIRF, along with the Local Organizing Committee (LOC) for this year's conference are monitoring public health coverage related to COVID-19 daily.

We want to assure delegates that, as of now, planning for the CARSP/PRI 2020 Joint Road Safety Conference is proceeding. Important dates and deadlines, including our updated cancellation/refund policy, are outlined below:

- Early Bird Registration deadline: **extended to April 20, 2020** (*from April 6th*)
- Last day to cancel registration and receive a full refund: **extended to May 20, 2020** (*from April 15th – plus we are waiving the $50 service fee*)
- Last day to cancel registration and receive a 50% refund less a $50 late withdrawal fee: **extended to May 31, 2020** (from May 15th)

This added flexibility to the cancellation/refund policy allows plenty of time to monitor the situation. If delegates need to cancel their registration for any reason, they may do so by **May 20th** for a full refund.

We have also been informed by the Holiday Inn (one of two official hotels of the CARSP/PRI 2020 Conference) that they will provide a full refund for cancellations within 45 days of the conference (May 1st) or at any point if the cancellation is due to COVID-19 event cancellation. Similarly, the Hotel Monville will reimburse individuals through their credit cards for the first night's fee that was charged at the time of booking.

We will provide another update soon based on information and guidelines issued by relevant authorities such as the Public Health Agency of Canada (PHAC), the Quebec Provincial Health Officer and the Montreal Medical Officer of Health.

Until that time, delegates may want to delay booking travel or carefully review airline insurance, cancellation, and flight change policies to ensure any cancellations or changes are eligible.

Please contact Brenda Suggett if you have any questions or would like more information: brenda.suggett@carsp.ca.

On behalf of CARSP, PRI, TIRF, and the LOC, stay safe and we hope to see you in Montreal.

Follow event updates on social media: #CARSPPRI2020

Twitter - #CARSPPRI2020

LinkedIn

Photo Credit: Kevin Nielsen

Slip Sliding Away: A Combined Portrait of Motor Vehicle Collision and Fall-Related Injuries During Winter Storms

Abstract

This study documents the degree to which both motor vehicle collisions and fall-related injuries occur during winter storms in the Region of Waterloo, Ontario. While fall-related injuries were more prevalent than injuries from motor vehicle collisions, both types of incidents increased substantially during winter weather events.

Résumé

Cette étude documente l'impact des conditions hivernales sur l'occurrence des collisions routières pour les véhicules à moteur ainsi que les blessures reliées aux chutes dans la région de Waterloo (Ontario, Canada). Alors que les blessures reliées aux chutes étaient plus fréquentes que les blessures causées par les collisions routières, les deux types d'incidents ont augmenté considérablement pendant ces événements météorologiques hivernaux.

Winter storms present challenges to the mobility of Canadians and the transportation systems upon which they depend for safe, orderly, and reliable travel.

These include reduced visibility in falling precipitation and blowing and drifting snow; slippery walking, biking, and driving surfaces; impassable walkways, paths and roads due to excessive snow depths, ice accretion, or fallen trees; and ice or snow-encumbered rail switches, vehicles, and other infrastructure.

Public and private sector investments to minimize these hazards, maintain safety, and limit disruptions are significant—winter maintenance in Canada alone costs billions of dollars annually in equipment, labour, and material expenditures e.g., rock salt, brine, sand (1).

Smaller yet substantive allocations are made to develop and operate information systems to support maintenance decisions and inform the public about pending storms and recommended actions to reduce exposure and sensitivity while travelling in poor conditions.

Adopted at the individual and household level, such adjustments include installation of winter tires, cancelling or rescheduling trips and activities, leaving extra time for trips,

altering routes and modes of travel, and taking extra precautions while driving, cycling or walking.

As part of the first author's PhD research, an exploratory project was initiated to better understand the efficacy of such interventions in terms of overall safety during winter storms with a particular emphasis on the influence of weather and related risk information on trip decisions and behaviour.

Focused on the Regional Municipality of Waterloo, Ontario, the study consists of three major components:

1) Longitudinal analysis of the relative risk of motor vehicle injury and non-injury collisions during winter storms (2002-2016);
2) Comparable longitudinal analysis of the relative risk of fall-related injuries (2009-2017); and
3) Descriptive and qualitative evaluation of the trip/activity behaviour, beliefs, and practices of a small, targeted convenience sample of households (2018-19 winter season).

The first two elements are largely complete and are the focus of this summary report (2,3). Aimed at establishing baseline risks and trends at an aggregate scale, they built upon the matched-pair technique pioneered and applied by Dr. Andrey to estimate collision risk during hazardous weather relative to normal, dry conditions for many Canadian cities (4,5). The current research involved identifying a series of storm events and corresponding control periods that are free of hazardous weather and matched by time and weekday, either one week earlier or one week later than the event. Weather radar imagery was used to define events and capture the entire lifecycle of 196 winter storms; this facilitated inclusion of a greater portion of time during which people respond to hazardous weather and deteriorated road or walking surface conditions compared to previous studies. Collision or injury counts for the event-control pairs were tabulated using regional road crash data derived from police reports and obtained from the Regional Municipality of Waterloo Department of Transportation (6). Event-control pairs were statistically analyzed to estimate relative risk and assess temporal trends.

The first investigation found that injury collisions increased by 68 percent during snowstorms and 80 percent during winter storms involving freezing rain, respectively, relative to dry weather conditions. Injury collision risk rose for both snowfall and mixed events as precipitation accumulation increased from low (<5 mm water equivalent) to moderate (5-9.9 mm water equivalent) amounts, but then dropped slightly for events with higher accumulations (≥ 10 mm water

Photo Credit: Jean Andrey

equivalent). Delayed awareness and response on the part of drivers, along with snow-clearing and de-icing practices of road maintenance authorities, were offered as plausible explanations for observed differences in relative collision risks across winter storm precipitation types and accumulation amounts.

The second investigation examined pedestrian falls, an important public health outcome and often ignored complement to transportation safety and mobility studies focused on motor vehicle collisions (7). Emergency department visitation data obtained from the Canadian Institute for Health Information were treated in an identical manner to that used in the collision analysis to estimate the effects of winter storms on fall-related injury risks in the study area. Winter storms were associated with 38 percent and 102 percent increases in the mean incidence of same-level falls (i.e., those not involving a change in elevation) involving ice and snow during snow events and freezing rain events, respectively. In absolute terms, same-level falls on ice and snow were 17 percent more frequent than motor vehicle collision injuries on regional roads (6) over the 96 storms examined in the comparable time period (2009-2016). Based on these results, and assuming they hold for other regions of the country, practitioners engaged in developing injury prevention strategies and related public risk messaging should consider placing greater emphasis on falls and multi-modal injury risks in communications related to winter storm hazards.

Two additional findings were common to both the collision and fall-related injury analyses. First, although consistent and significant effects of government-issued weather warning communications on risk outcomes were not found in either analysis, up to 75 percent of impactful winter storm events, as defined in the study, went unwarned. This lends further support to authorities re-evaluating warning thresholds from an impact rather than a purely meteorological perspective. Second, relative risks varied considerably over both short and long timeframes suggesting possible shifts in exposure, sensitivity, and/or risk-mitigating decisions, actions, and behaviour. The third and final component of the study will look explicitly at inter-storm and within-storm variation with results expected later this year. Over the longer-term, statistically significant declines in relative risk during winter storms were observed over the study periods of both analyses. Understanding why this is occurring, and then attributing improvements to specific winter road/walkway safety interventions and behavioural adjustments, are key foci for future research and for informing future risk-mitigating investments.

By Brian Mills and Dr. Jean Andrey

Brian Mills[ab] is an interdisciplinary scientist employed by Environment and Climate Change Canada based out of the University of Waterloo, where he is also completing a part-time PhD in Geography. Throughout his 27-year career with the federal government, Brian has applied social and physical scientific knowledge, data and methods to understand the impacts of weather and the use and socio-economic value of weather and related risk information in decision making within the transportation, health, and urban water management sectors.

Dr. Jean Andrey[b] is a professor and the Dean of the Faculty of Environment at the University of Waterloo, recently appointed for a second consecutive term. Her research examines weather and society, climate change impacts and adaptations, and weather-transport interactions. More generally, she is engaged in the challenge of creating transportation systems, and indeed cities, that are both safe and environmentally sustainable.

[a]Meteorological Research Division, Environment and Climate Change Canada
[b]Department of Geography and Environmental Management, University of Waterloo

References

1) Jones, B., 2003. Road maintenance costs in Canada in winter, chapter 5 in J. Andrey and C. Knapper (eds) *Weather and Transportation in Canada*, Department of Geography Publication Series, No. 55. University of Waterloo, Waterloo, Canada. pp.121-142.

2) Mills, B., J. Andrey, B. Doberstein, S. Doherty, and J. Yessis, 2019. Changing patterns of motor vehicle collision risk during winter storms: A new look at a pervasive problem, *Accident Analysis & Prevention*. 127,186-197. doi.org/10.1016/j.aap.2019.02.027.

3) Mills, B., J. Andrey, S. Doherty, B. Doberstein, and J. Yessis. Winter storms and fall-related injuries: Is it safer to walk than to drive? *Weather, Climate & Society*. In review.

4) Andrey, J., and S. Yagar, 1993. A temporal analysis of rain-related crash risk. Accident Analysis and Prevention 25(4), 465-472
5) Andrey, J. 2010. Long-term trends in weather-related crash risks. *Journal of Transport Geography* 18, 247-258.
6) Note: The crash data included all incidents reported to the Waterloo Regional Police Service that occurred on roads managed by the Regional Municipality of Waterloo or at signalized intersections and pedestrian crossings on local streets. It excluded collisions on other sections of local streets and provincial highways under the jurisdiction of the local area municipalities or the Province of Ontario.
7) Methorst, R., P. Schepers, N. Christie, M. Dijst, R. Risser, D. Sauter, and B. Wee, 2017: 'Pedestrian falls' as necessary addition to the current definition of traffic crashes for improved public health policies. *Journal of Transport and Health*, 6, 10-12.

Conférence conjointe ACPSER/PRI 2020 sur la sécurité routière Mise à jour COVID-19

À : Tous les délégués actuels et potentiels de la Conférence conjointe 2020 de l'ACPSER/PRI sur la sécurité routière

L'ACPSER et la PRI, ainsi que leur partenaire la FRBR et le Comité organisateur local (COL) de la conférence de cette année suivent quotidiennement la couverture de santé publique liée à la COVID-19.

Nous tenons à assurer les délégués que, pour le moment, la planification de la conférence conjointe CARSP/PRI 2020 sur la sécurité routière se poursuit. Voici quelques dates importantes, incluant notre politique d'annulation / remboursement qui a été modifiée :

- Date limite des inscriptions hâtives : **reporté au 20 avril 2020** (*au lieu du 6 avril*)
- Date limite d'annulation d'une inscription pour avoir droit à un remboursement complet : **reporté au 20 mai 2020** (*au lieu du 15 avril – de plus, nous annulons les frais administratifs de 50 $*)
- Date limite d'annulation d'une inscription pour avoir droit à un remboursement de 50 % moins des frais d'annulation tardive de 50 $: **reporté au 31 mai 2020** (*au lieu du 15 mai*)

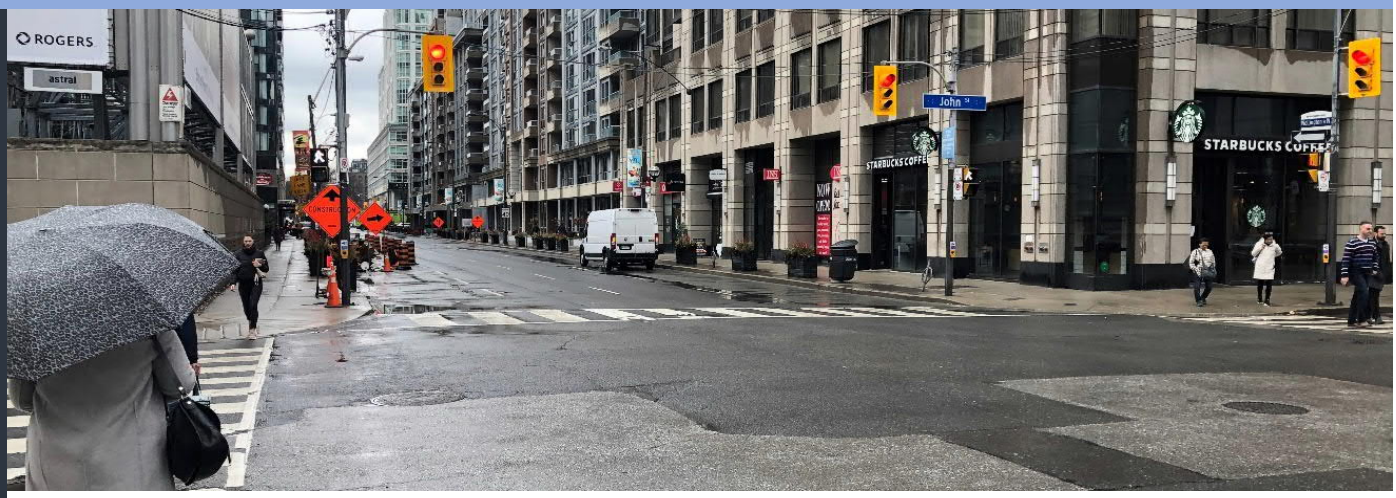
Cette souplesse accrue de la politique d'annulation/remboursement nous laisse assez de temps pour surveiller l'évolution de la situation. Si des délégués doivent annuler leur inscription pour une raison quelconque, ils peuvent le faire avant le 20 mai pour obtenir un remboursement complet.

Nous avons également été informés par l'hôtel Holiday Inn (l'un des deux hôtels officiels de la conférence ACPSER / PRI 2020) qu'il remboursera intégralement les annulations faites 45 jours avant la conférence (1er mai) ou à tout moment si l'annulation est due à l'annulation de l'événement à cause de la COVID-19. De même, l'hôtel Monville remboursera aux particuliers par carte de crédit les frais de la première nuit facturés au moment de la réservation. Nous vous transmettrons bientôt une autre mise à jour basée sur l'information et les directives fournies par les autorités compétentes, telles que l'Agence de la santé publique du Canada (ASPC), le directeur provincial de la santé publique du Québec et la directrice de la santé publique de Montréal. D'ici là, les délégués voudront peut-être retarder la réservation de leur voyage ou étudier attentivement les politiques des compagnies aériennes en matière d'assurance, d'annulation et de changement de vol pour vérifier les possibilités d'annulation ou de changement. Pour toute question, veuillez communiquer avec Brenda Suggett : brenda.suggett@carsp.ca.

Au nom de l'ACPSER, de la PRI, de la FRBR et du COL, soyez prudents et nous espérons vous voir à Montréal.

Suivez les mises à jour de l'événement sur les médias sociaux : #CARSPPRI2020

Twitter - #CARSPPRI2020 LinkedIn



Systemic Implementation of Leading Pedestrian Intervals in the City of Toronto

Abstract

The development of the City of Toronto's Vision Zero 2.0 – Road Safety Plan Update in 2019, provided an opportunity to evaluate the progress of the Vision Zero efforts, first introduced in 2016, as well as to refocus efforts on addressing the most common collisions resulting in serious injuries or fatalities. Through this process, Leading Pedestrian Intervals (LPI) were identified as a key measure to address the significant number of collisions between turning vehicles and pedestrians observed at signalized intersections. LPI implementation had previously been a request-based process.

With the commitment to have LPI as a feature of all possible signalized intersections across the city, a systematic approach for prioritizing and implementing LPI has been developed in partnership with various internal delivery partners and stakeholders. Implementing LPI as a part of the signal coordination process allows both an opportunity to mitigate the added vehicular delay associated with LPI as well as to ensure corridor-level consistency in signal programming, allowing drivers to become more familiar with LPI.

Résumé

L'élaboration de la *Vision Zéro 2.0 - Mise à Jour du Plan de Sécurité Routière* de la ville de Toronto en 2019 a fourni l'occasion d'évaluer les progrès des efforts de Vision Zéro, introduits pour la première fois en 2016, ainsi que de recentrer les efforts sur la lutte contre les collisions les plus courantes, entraînant de graves blessures ou décès. Grâce à ce processus, les intersections avec des feux pour piétons en mode partiellement protégé (MPP) ont été identifiés comme une mesure clé pour traiter le nombre signicatif de collisions entre les véhicules qui tournent et les piétons observées aux intersections signalées. La mise en œuvre des MPP était auparavant un processus basé sur les demandes.

Avec l'engagement d'avoir l'MPP systématiquement comme caractéristique de toutes les intersections signalées possibles à travers la ville, une approche systématique pour hiérarchiser et mettre en œuvre l'MPP a été développée en partenariat avec divers partenaires internes et parties prenantes. La mise en œuvre de l'MPP dans le cadre du processus de coordination des signaux permet d'atténuer le retard supplémentaire des véhicules associé à l'MPP ainsi que d'assurer la cohérence au niveau du couloir dans la programmation des signaux, permettant aux conducteurs de se familiariser avec le MPP.

The main objective of Toronto's Vision Zero Road Safety Plan, approved by Council in July 2016, is to eliminate serious injury and fatal collisions and to provide further protection for vulnerable road users. City Council unanimously approved the Vision Zero 2.0 Road Safety Plan Update on July 16th, 2019. This updated plan represents a renewed focus to enhance safety for vulnerable road users and recommends a set of more extensive, more proactive and more targeted initiatives that are informed by data.

2017-2021 | TORONTO'S ROAD SAFETY PLAN
VISION ZERO

In developing Vision Zero 2.0, the first step in ensuring efforts were best focused was identifying and visualizing where killed and serious injury (KSI) collisions had historically occurred in the city, particularly those involving vulnerable road users (VRUs). Pedestrians and cyclists make up 65% of road fatalities in Toronto. **Figure 1** shows a breakdown of pedestrian KSI collisions by type.

After mid-block crossings, left turn collisions at signalized intersections are the second most prevalent type of KSI collisions involving pedestrians (18%) and cyclists (8%). Right turn collisions at signalized intersections are responsible for 6% of pedestrian and 12% of cyclist KSI collisions. Left turn collisions with vulnerable road users are typically more dangerous compared to right turn collisions because drivers have picked up more speed by the time impact occurs.

Toronto has identified pedestrian head start signals, also known as Leading Pedestrian Intervals (LPI), as one of the key countermeasures for left turn collisions with pedestrians. LPI is a feature of a traffic signal that provides pedestrians with the opportunity to begin crossing the street before vehicles are permitted to proceed by delaying the corresponding vehicle green signal in the same direction.

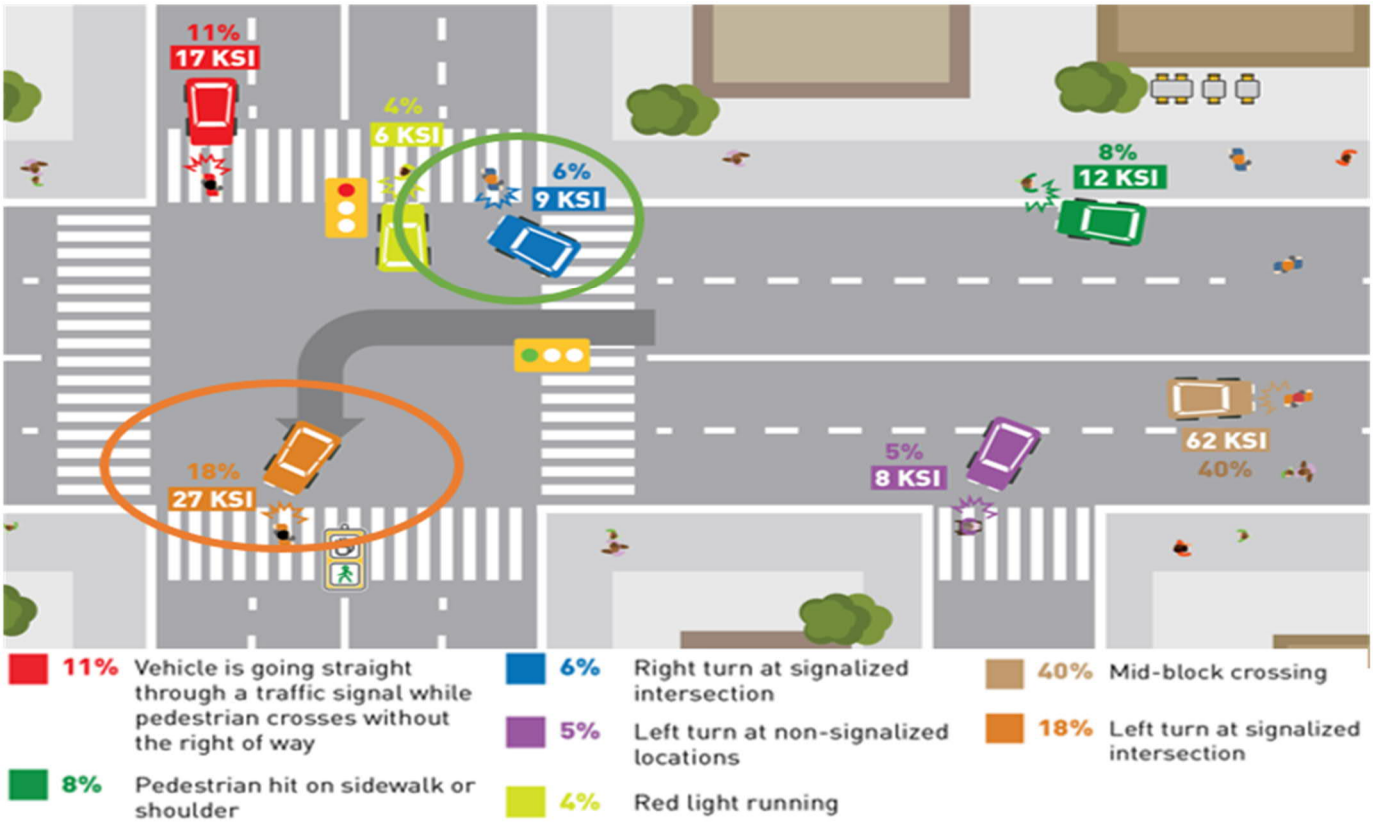


Figure 1 - Where pedestrians are being hit in Toronto (2014-2018)


Photo Credit: toronto.ca

This allows pedestrians to establish a presence in the crosswalk, which enhances their visibility to drivers and reinforces the pedestrian's right-of-way over turning vehicles.

LPI has been shown to be effective in improving pedestrian safety at intersections with low implementation costs (1). Many high-quality studies in the Crash Modification Factors (CMF) Clearinghouse database (2) show CMFs between 0.80 and 0.90. In the majority of cases, the signal timing change required to enable LPI can be implemented without other changes to the built form or equipment. Because of the benefits, relative ease and low cost of implementation, Vision Zero 2.0 called for wide-scale systemic application of LPIs for addressing turning collisions - a collision type common to most signalized intersections. Other planned measures include strategic application of right-turn-on-red prohibitions and expanding the toolbox by developing guidelines for fully protected signal turn phases, and conducting a left turn calming pilot program.

LPI was introduced to Toronto in 2004 and saw limited applications until 2014 when a guideline was developed following a jurisdictional scan of effectiveness. At that time there were seven intersections with LPI. Today LPI is a feature of 188 of the city's approximately 2,300 signalized intersections.

Previously, Transportation Services only used a reactive approach for implementing LPIs, selecting locations through two streams, based on either requests or observed collisions. The suitability of LPI was evaluated based on applying a worksheet that considered the following conditions:

- T-intersections and intersections of roads with one-way roads;
- irregular intersection geometry, obstructed sightlines;
- high volume of pedestrians crossing;
- high rate of collisions between pedestrians and turning vehicles;
- proximity to elementary schools;
- high level of activity by elderly residents; and
- high impact on vehicular traffic delay.

These conditions were analyzed and quantified through applying positive and negative scores to each, depending on the type and extent of impact, and adding up all values to see if the location met the established threshold. The goal was to target locations that would benefit the most. However, the process of conducting the analysis for the worksheet was resource intensive, including intersection capacity analysis, and the stringent threshold at times meant that high priority locations would not meet the requirement due to expected impact on vehicular delay.

Under Vision Zero 2.0, staff are developing a proactive approach for application of LPIs as a default safety feature for the majority of existing and new signalized intersections across the city. The first step of the process was a review of the existing city policy, a jurisdictional scan and consultation with various internal units to understand the process and challenges. Large scale roll out of LPIs will require modifications at hundreds of traffic signals. Implementation will have to be phased over several years. The approach that staff are exploring is to implement LPI in conjunction with corridor traffic signal coordination reviews.

This proactive implementation would address major concerns with sporadic application of LPI negatively impacting recently coordinated corridors. Added vehicular delay from LPI implementation could potentially be mitigated through improved signal coordination.

In addition, reactive implementation will continue on a request basis, with a revised worksheet with a lower threshold. Through this approach it is anticipated that, while targeting high-priority intersections, it will be possible to implement LPI at as many as 300 intersections per year, a significant increase from the 100 per year over the past few years.

In order to reduce the occasional instances of drivers mistaking LPI for signal malfunction, staff have developed "New Pedestrian Head Start" signs. The plan is to install this sign for a couple of months after LPI implementation at a particular signal to alert drivers to change in signal function and raise awareness of the Vision Zero program. A sign design that could be used for this purpose is shown as **Figure 2**.

Figure 2
Temporary sign to be installed at new LPI installations

While the City believes that it has identified the best approach to deliver wide-scale LPI implementation, there are also challenges that have been identified which staff are actively working on addressing. These include:

- the decision about modifying protected-permissive left turn operations to allow for LPI or fully protected left turn phase,
- the decision about acceptable level of impact on vehicular delay as a result of LPI,
- mitigating impacts on transit operation, and
- mitigating impacts on vehicular delay.

The Vision Zero approach to road safety is a large departure from traditional methods. Wide-scale, proactive, targeted and data driven initiatives are needed in order to see noticeable and rapid reductions in the numbers of people killed and seriously injured on the roads. Throughout this process, there are inevitably disruptions to the status quo, including changing priorities of the road network away from solely serving vehicular operations.

The City of Toronto's systemic approach with LPIs aims to see this become a default feature of every traffic signal. This change is not going to happen overnight but efforts are being made to identify challenges with wide-scale implementation and develop solutions to address those challenges to the extent possible.

By Mateen Mahboubi

Mateen Mahboubi has over 10 years of experience in the private and public sector delivering various transportation projects. Mateen is currently a Senior Project Manager in the City of Toronto's Vision Zero Projects Unit and is tasked with delivering many features of the City's Road Safety Plan including School Safety Zones and Leading Pedestrian

References

1. Studies across North America have shown that LPIs can reduce pedestrian-vehicle collisions by 20% to 60%. Goughnour et al. (2018) "Safety Evaluation of Protected Left-Turn Phasing and Leading Pedestrian Intervals on Pedestrian Safety", FHWA. Fayish & Gross (2009) "Safety Effectiveness of Leading Pedestrian Intervals Using the Empirical Bayes Method", Transportation Research Records

2. Developed as part of the Highway Safety Manual, Crash Modification Factors (CMF) estimate a countermeasure's ability to reduce crashes and crash severity. In practice, the CMF for a countermeasure can be multiplied by the average yearly number of crashes to determine the number of crashes expected to occur after the countermeasure has been implemented (i.e. a CMF <1.0 reflects an improvement in safety).

This issue of The Safety Network Journal was produced through the contributions of the following individuals:

Contributors / trices / teurs

Denise Beaton, BC Centre for Disease Control and BC Injury Research and Prevention Unit

Megan Oakey, BC Centre for Disease Control and BC Injury Research and Prevention Unit

Brian Mills, Meteorological Research Division, Environment and Climate Change Canada and Department of Geography and Environmental Management, University of Waterloo

Dr. Jean Andrey, Department of Geography and Environmental Management, University of Waterloo

Mateen Mahboubi, City of Toronto

Special Thanks

Kylee Bowman, Mildly Mad Graphics, mildlymadgraphics.com (CARSP logo modifications)

Please note

The process of Calls for Nominations for Election to CARSP Board of Directors and Lifetime Achievement Award is delayed until further notice.

Notez s'il vous plaît

Le processus d'appels de candidatures pour l'élection au conseil d'administration de CARSP et le prix pour l'ensemble des réalisations est retardé jusqu'à nouvel ordre.

CARSP-ACPSER

17 Meadowbrook Crescent

St Catharines, ON L2M 7G8

Canada

carsp.ca - acpser.ca

CARSP ACPSER

Canadian Association of Road Safety Professionals

L'Association canadienne des professionnels de la sécurité routière