THE OFFICIAL NEWSLETTER OF THE CANADIAN ASSOCIATION OF ROAD SAFETY PROFESSIONALS/
LE BULLETIN OFFICIEL DE L'ASSOCIATION CANADIENNE DES PROFESSIONALS DE LA SÉCURITÉ ROUTIÈRE

The Safety Network/ Le Réseau-Sécurité

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

Issue 4 2019

IN THIS ISSUE

Editorial

It has been two years since I took on the Chief Editor role of the Safety Network Newsletter. I've had the pleasure of collaborating with a group of experts from across the country and in mutiple disciplines. This Editorial Board has written articles, identified authors to contribute to the Newsletter, edited, translated and secured photos for our use. They are the backbone to this publication. The Safety Network Newsletter is an outlet where current and emerging issues are tackled so that all of us dedicated to making our road safer can access the best evidence available. It's a tool to showcase achievements and recognize the contributions of individuals who have spent a good portion of their professional lives ensuring more Canadians get home safely every night. In the 20 years I have worked in this field significant successes have been realized and, unfortunately, new issues have been created that work against our collective road safety goals. This Newsletter is a key tool and venue for road safety professionals. Eight editions later, as I step back from the Chief Editor role, I am pleased to remain a member of the Editorial Board and continue to provide colleagues with access to important information and evidence to inform their work. It's my pleasure to pass the 'pen' to the incoming Chief Editor, Chris Poirier. Chris is the Project Manager, Transportation at Associated Engineering Alberta Ltd. in Lethbridge. He recently certified as a road safety professional and has many years experience in the area of transportation safety. Chris is excited to take on the role of Chief Editor and I know he will bring new ideas and energy to the Safety Network Newsletter. Welcome Chris!

Pamela Fuselli, MSc
Chief Editor

Éditorial

Cela fait maintenant deux ans que j'assume le rôle de rédactrice en chef du bulletin d'information du réseau de sécurité. J'ai eu le plaisir de collaborer avec un groupe d'experts de partout au pays et de disciplines variées. Ce comité de rédaction a rédigé des articles, identifié des auteurs pour contribuer au bulletin, édité, traduit et pris des photos pour notre bon usage. Ils sont les maîtres d'œuvres de cette publication. Le bulletin d'information du réseau de sécurité est un point de rencontre où les problèmes actuels et émergents sont traités, de sorte que nous, tous déterminés à rendre notre réseau routier plus sûre, pouvons accéder aux meilleures preuves disponibles en recherche et pour nos pratiques. C'est un outil pour mettre en valeur les réalisations et reconnaître les contributions de personnes qui ont passé une bonne partie de leur vie professionnelle à faire en sorte que plus de Canadiens rentrent chez eux en toute sécurité chaque soir. Au cours des 20 dernières années de travail où j'ai travaillé dans ce domaine, des succès importants ont été réalisés et, malheureusement, de nouvelles problématiques sont apparues, voir créées, qui vont à l'encontre de nos objectifs collectifs en matière de sécurité routière. Ce bulletin d'information est un outil essentiel pour les professionnels canadiens de la sécurité routière. Huit éditions plus tard, alors que je me retire du rôle de rédactrice en chef, je suis heureuse de rester membre du comité de rédaction et de continuer à fournir aux collègues un accès à des informations et des preuves importantes pour orienter leur travail et leur pratique. C'est pour moi un plaisir de remettre la "plume" au nouveau rédacteur en chef, Chris Poirier. Chris est gestionnaire de projet chez Transportion, Associated Engineering Alberta Ltd. à Lethbridge. Il a récemment obtenu son diplôme de professionnel de la sécurité routière et possède de nombreuses années d'expérience dans le domaine de la sécurité des transports. Chris est ravi d'assumer ce nouveau rôle de rédacteur en chef et je sais qu'il apportera de nouvelles idées et de nouvelles ressources au bulletin d'information du réseau de sécurité. Bienvenue Chris!

Pamela Fuselli
Rédactrice en chef

What municipalities and road safety stakeholders need to know about snow clearing around road-rail level crossings: Highlights from a recent Transportation Safety Board (TSB) investigation (2018)

By Christina Rudin-Brown, Ph.D, CCPE

Dr. Christina (Missy) Rudin-Brown has been a Senior Human Factors Investigator since joining the TSB in 2012 and is currently Manager of the TSB's Human Factors and Macro Analysis Division.

Abstract
On the morning of 9 January 2018, a CN freight train proceeding eastward struck a snowplow on the sidewalk at the Colborne Street public crossing in London, Ontario. The lone snowplow operator was fatally injured. The Transportation Safety Board (TSB) investigation found that the collision occurred when the snowplow travelled onto the railway crossing while clearing snow from the sidewalk. Although the crossing warning devices and the train's horn activated while the snowplow was in the crossing, the operator did not detect the oncoming train. The investigation also found that the contractor and subcontractor involved in this occurrence did not provide formal training to their employees on safe working practices when clearing snow at railway crossings. Following this occurrence, the City of London modified its requirements for snowplow operators employed by its sidewalk snow-clearing contractors.

On the 9th of January 2018, at about 0940 am, a Canadian National freight train, while proceeding east on the Dundas Subdivision, approached the Colborne Street public crossing in London, Ontario. The crossing was equipped with flashing light signals, a bell, and gates.

Colborne Street public crossing, looking north (Source: TSB)

The train crew observed a snowplow travelling slowly northward toward the crossing while clearing snow from the sidewalk. Travelling onto the crossing, the snowplow continued to clear snow. The locomotive engineer sounded the locomotive horn to alert the snowplow operator to the oncoming train. When it became apparent that the snowplow would not be clear of the crossing before the train reached it, the locomotive engineer initiated an emergency brake application. However, the train was not able to stop before the crossing and struck the snowplow. In the seconds leading up to impact, the snowplow operator did not look toward the train. As a result of the collision, the lone occupant of the snowplow was fatally injured.

Temperature at the time was −4 °C, with wind blowing at about 12 km/h from the west. Visibility was approximately 9 km. There was approximately 30 cm of snow on the ground the day before the collision, with an additional 12.3 cm to 18.5 cm of snow falling overnight.

Bobcat S130 skid-steer loader equipped with a blower (Source: TSB)

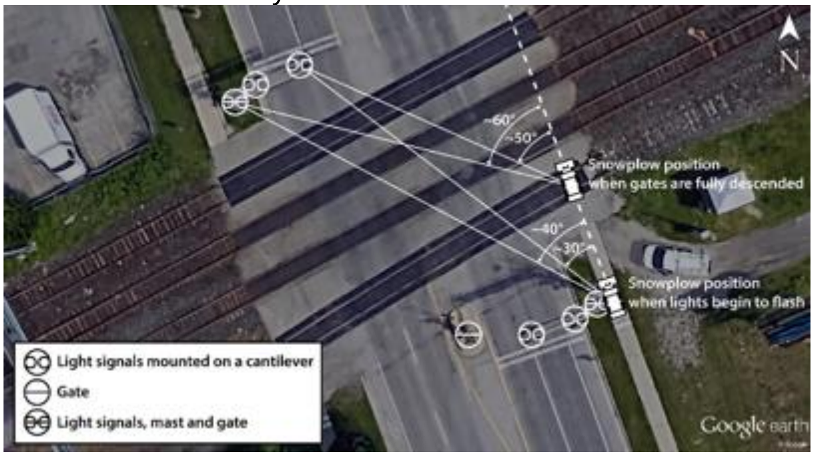
The investigation
The investigation included the following activities:

- a detailed site inspection
- re-enactment of the collision
- audio analysis of train horn audibility
- review of a security camera recording retrieved from a nearby office building
- an evaluation of human factors issues, including operator attention, expectations, knowledge, and experience.

Neither the actions of the train crew nor the condition of the rail equipment were contributing factors to the collision. There was also no indication that the snowplow operator had any medical or psychological condition that would have contributed to the collision. The collision occurred when the snowplow travelled onto the railway crossing while continuing to clear snow from the sidewalk.

What happened?
Review of security video showed that the snowplow was clearing snow from the sidewalk as it approached, and then travelled onto, the crossing from the south. The lights in the southeast quadrant of the crossing first activated when the snowplow was adjacent to the crossing warning system mast and gate. Owing to the positioning of the snowplow beside the south lights and gates when they became active, the flashing lights were not in the operator's field of view and therefore did not alert him to the presence of the oncoming train. He continued past the crossing mast and gate and, as he was approaching the tracks, the gates began to descend. When the snowplow had reached the southern-most track, the gates had completed their descent. The snowplow continued forward onto the south main track, where the collision occurred.

As the snowplow travelled onto the crossing and into the path of the train, the snowplow operator's attention was focused either directly forward at the sidewalk that was about to be cleared of snow or off to the right-hand side where the snow was being thrown toward the east. As a result, the crossing warning system mast and gate in the northwest quadrant of the crossing, as well as the lights on the cantilever, were in the operator's peripheral visual field, reducing the likelihood that they would be detected.



Location of the snowplow and viewing angles from the cab to the grade crossing warning devices (Source: Google Earth, with TSB annotations)

The collision re-enactment found that the operator's view from the cab of the snowplow was restricted. The front-left cab frame pillar obstructed the sightlines to the crossing lights and gates in the northwest quadrant when the snowplow was on the crossing. As well, the screening on the side windows hindered the view along the tracks. The restricted sightline further reduced the likelihood of the operator detecting the activated crossing warning system or the oncoming train.

Photo taken from a driver's seated eye position in the snowplow showing the view toward the northwest quadrant of the crossing when the snowplow was positioned adjacent to the southeast quadrant crossing warning system mast (the location of the snowplow when the gates began to descend) (Source: TSB)

The bells at a crossing, and the train horn, are meant to alert crossing users to the presence of a train. Audio analysis found that the background noise of the operation of the snowplow would have prevented both the crossing bell and the train horn from alerting the operator.

What can be done to reduce the likelihood of this kind of collision, in future?
The following factors were determined to have contributed to the collision. The elimination of any one of these factors may have affected the outcome:

Factors limiting the snowplow operator's visual search
Training, experience, and expectations can influence the effectiveness of a driver's visual search for trains and warning cues at railway crossings. The snowplow operator was not experienced at clearing snow from crossings, having worked just 5 shifts in total, and it was only his 2nd shift involving this specific crossing. In addition, he was not an experienced motor vehicle driver and had received little, if any, training on how to approach and operate over railway crossings. His limited experience with railway crossings in general, and with this specific crossing in particular, and his lack of training on safe working practices when clearing snow at railway crossings inhibited the effectiveness of the operator's visual scanning. As a result, he did not detect the oncoming train.

The snowplow operator, who had been awake for more than 22 hours and on the job for about 11 hours, was likely experiencing fatigue. Due to a combination of the effects of fatigue, the effects of an increased demand for attentional resources from a relatively new and complex task of clearing snow, and the effects of loud background noise from the snowplow, the snowplow operator was likely experiencing tunnel vision or attentional narrowing toward the snow-clearing task. The effect of tunnel vision exacerbated by fatigue likely also diminished the snowplow operator's visual scanning behaviour in the moments leading up to the occurrence.

Inadequate training and supervision
Under the Ontario *Occupational Health and Safety Act*, employers have concurrent responsibility to ensure the health and safety of employees and to take every precaution reasonable in the circumstances to protect a worker. The Act and the Ontario *Occupational Health and Safety Awareness and Training Regulation* require employers to provide information, instruction, and supervision to workers to protect their health and safety; to ensure that workers, or persons in authority over workers, are informed of any safety hazard and the measures and procedures to be taken to ensure the workers' safety; and to ensure that workers are adequately trained. In this occurrence, employers did not provide any training to the snowplow operator.

The City of London has a training program to instruct its employees on the proper and safe execution of their duties, including sidewalk plowing. To ensure that the training program is complete, the City has also undertaken risk assessments on individual tasks, including sidewalk plowing and sanding. Employees' attendance at these courses is tracked and monitored, and any requirement for recurrent training is identified. With these procedures, the City's objective is to prepare its sidewalk snowplow operators with the information, training, and supervision they need to perform their duties safely. The City also stipulated training requirements for contractor employees in its contracts.

However, the contractor and sub-contractor that employed the snowplow operator did not have programs for its snowplow operators. They hired an inexperienced employee who did not hold a full driver's licence and provided no formal training program to ensure that the employee had the skills and knowledge to perform his duties safely. As a result, the employee received no formal training and instruction on safely operating over railway crossings or on clearing snow from sidewalks over railway crossings.

Inadequate oversight of contractors by municipality

Despite certain requirements specified in the contract with the City, and the responsibilities under the provincial act, the contractor did not ensure that the sub-contractor had a training program that met the requirements of the *Occupational Health and Safety Awareness and Training Regulation*, or that the sub-contracted operators were fully informed of the workplace hazards, and related work procedures, while on duty. In addition, the contractor did not ensure that all sub-contracted operators met the requirements specified in the contract. Therefore, the oversight by the contractor did not ensure that its employees and subcontractors assigned to the snow-clearing contract for the City were properly trained and qualified.

The City of London, through its tendering process, placed requirements on its contractors to ensure that the contractors' operators were qualified to perform their duties safely. For example, the tender required the City's contractors for sidewalk snow-clearing operations to submit a list of qualified machine operators, ensure that their operators had a Class G driver's licence, be responsible for training those operators, and use only those operators on the list. Moreover, contractors were not to enter into any subcontracting agreement without first obtaining the City's consent. The contractor subcontracted part of the work under its City of London contract without obtaining approval from the City.

As well as not ensuring that the contractors had developed and conducted an adequate training program, the City did not maintain a list of qualified snowplow operators, did not ensure that only those operators on the list were used, did not ensure that no unapproved subcontractor was employed, and did not ensure that those operators maintained their Class G driver's licence. Once the contract was awarded to the contractors, none of the requirements listed in the tender were verified. For this reason, the City's oversight of its snow-clearing contractors did not identify that snowplow operators did not have sufficient training and qualifications to perform their duties safely.

Safety action taken:

Following the collision, the City of London required snowplow operators employed by its sidewalk snow-clearing contractors to participate in a City-led review of safe operating practices at railway crossings. Guidance documents on clearing snow at crossings were distributed to snowplow operators at this review session.

For the full investigation report, see http://www.bst-tsb.gc.ca/eng/rapports-reports/rail/2018/R18T0006/R18T0006.html.

Ce que les municipalités et les intervenants en sécurité routière doivent savoir sur le déneigement aux passages à niveau: points saillants d'une récente enquête du Bureau de la sécurité des transports (BST)

Par Christina Rudin-Brown, Ph.D, CCPE

Dr. Christina (Missy) Rudin-Brown est enquêteuse principale en facteurs humains depuis son arrivée au BST en 2012 et est actuellement gestionnaire de la Division des facteurs humains et de l'analyse macro .

Résumé
Le matin du 9 janvier 2018, un train de marchandises du CN circulant vers l'est a percuté une déneigeuse sur un trottoir au passage à niveau public de la rue Colborne à London, Ontario. Le conducteur de la déneigeuse, seul à bord du véhicule, a été mortellement blessé. L'enquête du Bureau de la Sécurité des Transports (BST) a permis de déterminer que l'accident s'est produit lorsque la déneigeuse s'est engagée dans le passage à niveau tout en continuant de déneiger le trottoir. Même si le système d'avertissement du passage à niveau et le klaxon du train étaient activés pendant que la déneigeuse était dans le passage à niveau, le conducteur n'a pas détecté le train qui approchait. L'enquête a également permis de déterminer que l'entrepreneur et le sous-traitant en cause dans l'événement en question n'ont donné à leurs employés aucune formation officielle sur les pratiques de travail sécuritaire pour le déneigement de passages à niveau. À la suite de cet événement, la Ville de London a modifié les exigences pour les conducteurs de déneigeuse au service de ses entrepreneurs en déneigement de trottoirs.

Le 9 janvier 2018, à environs 9h 40, un train de marchandises de la Compagnie des chemins de fer nationaux du Canada circulant vers l'est sur la subdivision de Dundas approchait le passage à niveau public de la rue Colborne, en London, Ontario. Ce passage à niveau était muni de feux clignotants, d'une sonnerie et de barrières.

Passage à niveau public de la rue Colborne (vue vers le nord) (Source : BST)

L'équipe de train a aperçu une déneigeuse qui circulait lentement vers le nord en direction du passage à niveau public en déneigeant le trottoir. La déneigeuse a continué de souffler la neige pendant qu'elle franchissait le passage à niveau. Le mécanicien de locomotive a actionné le klaxon de locomotive pour avertir le conducteur de la déneigeuse de l'approche du train. Lorsqu'il est devenu évident que la déneigeuse ne quitterait pas le passage à niveau avant que le train ne l'atteigne, le mécanicien de locomotive a serré les freins d'urgence. Toutefois, le train n'a pas pu s'immobiliser avant d'atteindre le passage à niveau et a percuté la déneigeuse. Durant les secondes qui ont précédé l'impact, le conducteur de la déneigeuse n'a pas tourné son regard en direction du train. Par suite de la collision, l'unique occupant de la déneigeuse a été mortellement blessé.

La température au moment de l'événement était de −4 °C, avec des vents d'ouest soufflant à environ 12 km/h. La visibilité était d'environ 9 km. Il y avait environ 30 cm de neige au sol la veille de la collision, avec 12,3 cm à 18,5 cm supplémentaires de neige tombant au cours de la nuit.

Chargeur compact à direction à glissement muni d'un chasse-neige Bobcat S130 (Source : BST)

L'enquête
L'enquête comprenait les activités suivantes:

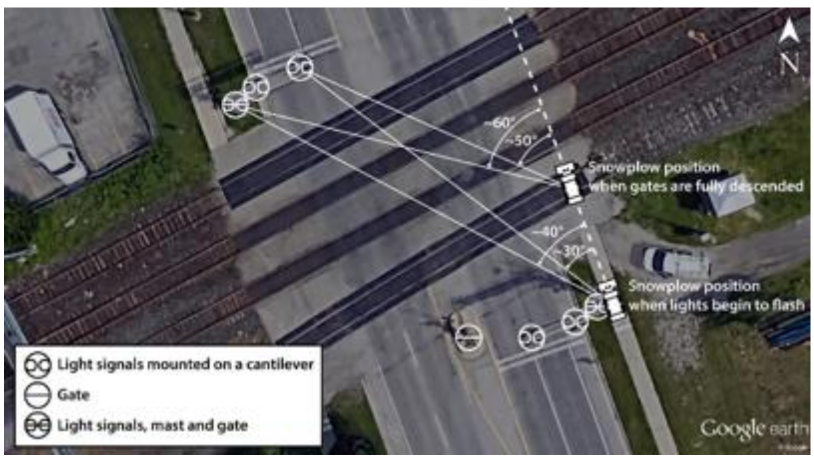
- un examination détaillée du site
- la reconstitution de la collision
- analyse audio de l'audibilité du klaxon
- examen d'un enregistrement de caméra de sécurité récupéré d'un immeuble de bureaux à proximité
- une évaluation des enjeux de facteurs humains, y compris l'attention de l'opérateur, ses attentes, ses connaissances et expérience.

Ni les mesures prises par l'équipe de train ni l'état de l'équipement ou du matériel roulant n'ont été des facteurs contributifs à l'accident. Il n'y avait aucun signe que le conducteur de la déneigeuse eût quelque trouble médical ou psychologique qui aurait pu contribuer à l'accident. L'accident s'est produit lorsque la déneigeuse s'est engagée sur le passage à niveau tout en continuant de déneiger le trottoir.

Qu'est-il arrivée?
Examen de la vidéo de sécurité a montré que la déneigeuse enlevait la neige du trottoir alors qu'elle s'approchait du passage à niveau, avant de s'engager dans celui-ci en provenance du sud. Les feux de signalisation dans le quadrant sud-est du passage à niveau ont commencé à clignoter lorsque la déneigeuse se trouvait à côté du mât et des barrières du système d'avertissement de passage à niveau. Comme la déneigeuse était positionnée à côté des systèmes d'avertissement du passage à niveau sud au moment où ils se sont déclenchés, les feux clignotants ne se trouvaient pas dans le champ visuel du conducteur et

ne l'ont donc pas averti du train qui approchait. Le conducteur s'est avancé au-delà du mât et des barrières de protection, et au moment où il approchait des voies, les barrières ont commencé à s'abaisser. Au moment où la déneigeuse a atteint la voie la plus au sud, les barrières avaient achevé leur descente. La déneigeuse a continué d'avancer sur la voie principale sud, où la collision s'est produite.

Alors que la déneigeuse roulait sur le passage à niveau et dans la trajectoire du train, le conducteur du véhicule concentrait son attention soit droit devant lui sur le trottoir qu'il s'apprêtait à déneiger, soit vers sa droite, où il soufflait la neige (vers l'est). Par conséquent, le mât et la barrière du système d'avertissement dans le quadrant nord-ouest du passage à niveau, de même que les feux en porte-à-faux, se trouvaient dans le champ de vision périphérique du conducteur de la déneigeuse, ce qui a réduit la probabilité qu'il les aperçoive.



Position de la déneigeuse et angles de vue depuis son habitacle vers le système d'avertissement du passage à niveau (Source : Google Earth, avec annotations du BST)

La reconstitution de la collision a trouvé que la vue du conducteur depuis l'intérieur de l'habitacle de la déneigeuse était limitée. Le montant avant gauche de l'habitacle obstruait la ligne de visibilité des feux et des barrières dans le quadrant nord-ouest du passage à niveau lorsque la déneigeuse occupait le passage à niveau. De plus, le grillage qui couvrait les vitres latérales réduisait la visibilité le long des voies. La ligne de visibilité restreinte a davantage réduit la probabilité que le conducteur détecte les systèmes d'avertissement du passage à niveau ou le train qui approchait.

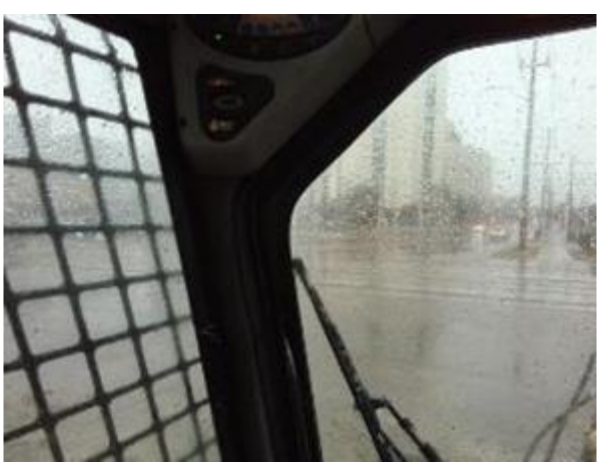


Photo prise du point de vue d'un conducteur assis dans la déneigeuse et montrant la vue vers le quadrant nord-ouest du passage à niveau, lorsque la déneigeuse était adjacente au mât du système d'avertissement du quadrant sud-est (position de la déneigeuse lorsque les barrières ont commencé à s'abaisser) (Source : BST)

Les sonneries d'un passage à niveau, de même que le klaxon d'un train, servent à avertir les usagers d'un passage à niveau de l'approche d'un train. L'analyse audio a conclu que le bruit de fond généré par le fonctionnement de la déneigeuse a empêché le conducteur du véhicule d'entendre la sonnerie du système d'avertissement et le klaxon du train.

Que peut-on faire pour réduire les risques de ce type de collision à l'avenir?
Il a été déterminé que les facteurs suivants ont contribué à la collision. L'élimination de l'un ou l'autre de ces facteurs peut avoir influé sur le résultat:

Facteurs limitant la recherche visuelle de l'opérateur de chasse-neige
La formation, l'expérience et les attentes peuvent influer sur l'efficacité de la recherche visuelle de trains et de signes d'avertissement aux passages à niveau par un conducteur. Le conducteur de la déneigeuse n'avait aucune expérience du déneigement des passages à niveau; il n'avait travaillé que 5 quarts en tout, et il ne s'agissait que du 2e quart au cours duquel il devait croiser le passage à niveau à l'étude. De plus, il n'était pas un conducteur chevronné de véhicule automobile et n'avait reçu que peu de formation, voire aucune, sur la façon d'approcher et de franchir un passage à niveau ferroviaire. Son expérience limitée des passages à niveau ferroviaires en général, et du passage à niveau en cause dans l'événement à l'étude en particulier, ainsi que son manque de formation sur les pratiques de travail sécuritaires pour le déneigement d'un passage à niveau ferroviaire, ont diminué l'efficacité de son balayage visuel. Par conséquent, il n'a pas détecté le train qui approchait. Le conducteur de la déneigeuse, qui avait été éveillé pendant plus de 22 heures et au travail pendant 11 heures, ressentait probablement de la fatigue. Étant donné la combinaison des effets de la fatigue, des effets d'une demande accrue de ressources attentionnelles pour exécuter une tâche relativement nouvelle et complexe (le déneigement), et des effets du fort bruit de fond produit par la déneigeuse, le conducteur ressentait probablement les effets de la vision tubulaire ou du rétrécissement de l'attention à l'égard de la tâche de déneigement. En outre, l'effet de vision tubulaire exacerbé par la fatigue a probablement réduit l'efficacité du balayage visuel du conducteur dans les instants qui ont précédé l'événement.

Formation et supervision inadéquates
En vertu de la *Loi sur la santé et sécurité au travail* de l'Ontario, il incombe aux employeurs à la fois de veiller à la santé et sécurité de leurs employés et de prendre toute précaution raisonnable dans les circonstances pour protéger un travailleur. Cette Loi, de même que le *Règlement sur la sensibilisation à la santé et à la sécurité au travail et formation* de l'Ontario, impose aux employeurs d'informer, d'instruire et de superviser les travailleurs pour protéger leur santé et leur sécurité; de s'assurer que les travailleurs ou les personnes qui exercent une autorité sur eux sont informés de tout danger pour la sécurité et des procédures à prendre pour assurer la sécurité des travailleurs; et de s'assurer que les travailleurs ont reçu une formation adéquate. Dans l'événement à l'étude, les employeurs n'ont donné aucune formation au conducteur de la déneigeuse.

La Ville de London s'est dotée d'un programme de formation pour apprendre à ses employés comment exécuter leurs tâches, y compris le déneigement des trottoirs, de façon appropriée et sécuritaire. Pour s'assurer que le programme de formation est complet, la Ville a également mené des évaluations des risques pour des tâches individuelles, y compris le déneigement des trottoirs et l'épandage de sable. La présence des employés à ces cours est suivie et vérifiée, et tous les besoins en matière de formation périodique sont cernés. Forte de ces procédures, la Ville a pour objectif de préparer ses conducteurs de déneigeuse de trottoirs avec l'information, la formation et la supervision qu'il leur faut pour effectuer leurs tâches en toute sécurité. La Ville a également stipulé dans ses contrats des exigences en matière de formation pour les employés des entrepreneurs.

Or, l' entrepreneur et le sous-traitant n'avait aucun programme en place pour des conducteurs de déneigeuse ou pour ses sous-traitants. Ils ont embauché un employé novice qui n'était pas titulaire d'un permis de conduire de catégorie G et ne lui a offert aucun programme de formation formel pour s'assurer qu'il avait les compétences et connaissances requises pour s'acquitter de ses tâches de façon sécuritaire. Ainsi, l'employé n'a reçu aucune formation ni instruction formelle sur la conduite sécuritaire sur un passage à niveau ferroviaire ou sur le déneigement de trottoirs sur un passage à niveau ferroviaire.

Surveillance inadéquate des entrepreneurs par la municipalité

Malgré certaines exigences que stipulait le contrat passé avec la Ville, et malgré ses responsabilités en vertu de la loi provinciale, l'entrepreneur n'a pas vérifié si le sous-traitant avait un programme de formation qui satisfaisait aux exigences du *Règlement sur la sensibilisation à la santé et à la sécurité au travail et formation*, ou que les conducteurs du sous-traitant étaient entièrement informés des dangers en milieu de travail et des procédures de travail connexes pendant qu'ils étaient en service. De plus, l'entrepreneur n'a pas vérifié si tous les conducteurs du sous-traitant satisfaisaient aux exigences stipulées au contrat. Par conséquent, la surveillance exercée par l'entrepreneur n'a pas fait en sorte que ses employés et sous-traitants affectés au contrat de déneigement pour la Ville soient adéquatement formés et qualifiés.

La Ville de London, par l'intermédiaire de son processus d'appel d'offres, a imposé des exigences à ses entrepreneurs pour s'assurer que leurs conducteurs avaient les qualifications pour effectuer leurs tâches en toute sécurité. Par exemple, l'appel d'offres de la Ville exigeait que les entrepreneurs qui effectuent le déneigement des trottoirs remettent une liste de conducteurs qualifiés, veillent à ce que leurs conducteurs détiennent un permis de conduire de catégorie G, assument la responsabilité de former leurs conducteurs, et fassent appel uniquement aux conducteurs inscrits sur la liste. Qui plus est, les entrepreneurs ne devaient conclure aucune entente de sous-traitance sans d'abord obtenir le consentement de la Ville. L'entrepreneur a donné en sous-traitance une partie du travail prévu dans son contrat avec la Ville de London sans d'abord obtenir le consentement de la Ville.

En plus de ne pas avoir vérifié que les entrepreneurs avaient développé et mené un programme de formation adéquat, la Ville n'a tenu aucune liste de conducteurs de déneigeuse qualifiés, n'a pas veillé à ce qu'on fasse appel à ces seuls conducteurs, n'a pas fait en sorte qu'on ne fasse pas appel à des sous-traitants inadmissibles, et n'a pas vérifié que les conducteurs étaient titulaires d'un permis de conduire de catégorie G valide. Après l'attribution du contrat aux entrepreneurs, aucune des exigences stipulées dans l'appel d'offres n'a été vérifiée. Pour cette raison, la surveillance exercée par la Ville de ses entrepreneurs de déneigement n'a pas révélé que les conducteurs de déneigeuse n'avaient reçu aucune formation adéquate et n'avaient pas les qualifications requises pour effectuer leurs tâches en toute sécurité.

Mesures de sécurité prises:

À la suite de l'accident, la Ville de London a exigé que les conducteurs de déneigeuse au service de ses entrepreneurs de déneigement de trottoirs participent à un examen des pratiques de travail sécuritaires aux passages à niveau organisé par la Ville. Des directives sur le déneigement des passages à niveau ont été distribuées aux conducteurs de déneigeuse à l'occasion de cette séance d'examen.

Pour le rapport d'enquête complet, voir http://www.bst-tsb.gc.ca/fra/rapports-reports/rail/2018/r18t0006/r18t0006.html.

BC's Shift into Winter Campaign Enters its Second Decade

By Louise Yako, Road Safety at Work

Louise has extensive leadership experience in the transportation and safety sectors. She is a former Board member of WorkSafeBC and CEO of the BC Trucking Association.

Résumé
Orientée sur l'hiver, la 11e campagne annuelle multi-organisationnelle et multimédia de la Colombie-Britannique a été lancée le 1er octobre 2019 afin de réduire le risque d'accidents liés aux conditions hivernales. L'audience visé par cette campagne est le grand public, les employeurs et les entreprises qui gèrent des chauffeurs professionnels. Cette campagne est une initiative provinciale conjointe initiée par la Winter Driving Safety Alliance, un groupe de 20 organisations impliquées pour améliorer les comportements routiers. ShiftIntoWinter.ca fournit des informations et des ressources destinées aux conducteurs, aux employeurs et aux superviseurs, ainsi qu'aux groupes plus à risque étant donné leur exposition.

Shift into Winter, British Columbia's 11th annual, multi-organizational, multi-media campaign to undertake direct action to reduce the risk of winter weather-related crashes launched on October 1, 2019. That date coincides with BC's seasonal requirement for motor vehicles to be equipped with winter tires or carry tire chains on most highways in the province. The campaign's audiences are the general public as well as employers and supervisors who manage staff who drive for work.

In BC, on average, the number of casualty crashes due to driving too fast for the conditions increases by 87 percent in December compared to October – about 236 crashes in December compared to 126 in October[1]. The statistics involving those who drive for work are equally concerning -- almost one-third of all work-related crashes resulting in injury and time-loss claims occur during November, December and January.

The Shift into Winter campaign is a joint, provincial initiative led by the Winter Driving Safety Alliance – a group of 20 organizations committed to working together to improve safe winter driving behaviours and practices in BC. Members include Ambulance Paramedics of B.C. (CUPE 873), Automotive Retailers Association, BCAA, BC Forest Safety Council, BC Road Builders and Heavy Construction Association, BC Trucking Association, City of Prince George, Concrete BC, Government of BC, Insurance Corporation of BC, Justice Institute of British Columbia, Kal Tire, Mainroad Group, RCMP, SafetyDriven, Tiger Calcium, Tire and Rubber Association of Canada, Wilson M Beck Insurance Group, and WorkSafeBC.

The campaign raises awareness and directs the driving public, employers and supervisors to the ShiftintoWinter.ca website through paid, earned and social media. ShiftIntoWinter.ca provides information and resources aimed at:

- Drivers – on how to prepare their vehicle and themselves for winter conditions.
- Employers and supervisors in the form of a toolkit that contains all the information necessary to develop and maintain a winter safe driving program and an online course.
- Specific groups like truck drivers and home and community care workers whom data indicate have a higher risk due to exposure.

The keys to the success of Shift into Winter are the reach that it engenders through its partnership and stakeholder engagement, as well as its multi-media promotional campaign. Alliance members are encouraged to use and customize promotional materials, such as social media messages and images, by co-branding the material.

The Shift into Winter campaign relies on paid, earned (unpaid), and social media and electronic highway message signs to raise public awareness. Alliance members and Shift into Winter campaign supporters are also encouraged to notify local media when a related educational or enforcement event is scheduled to take place since winter driving preparations can be location specific. But the biggest factor in campaign awareness seems to be the weather itself. Past research indicates that campaign recall is higher when regions suffer more severe weather.

The Alliance is well aware that BC winters are becoming more unpredictable. Winter means different things in different parts of the province -- from rain and fog in the south, to snow and ice in the north. Regardless of the type of weather, winter conditions (colder temperatures, rain, snow, black ice, reduced visibility and fewer daylight hours) present serious hazards for all drivers, professional or otherwise.

For drivers, successfully navigating winter driving conditions are dependent on the twin principles of preparation and delay. These principles are incorporated in key messages:

- Prepare your vehicle by installing a set of four matched winter tires, undergoing a pre-season maintenance check-up and equipping it with an emergency kit.
- Prepare yourself by knowing or learning how to drive for the conditions before you get behind the wheel.
- Don't go when faced with poor road and weather conditions.
- Know before you go by checking weather and road conditions when travel by motor vehicle can't be postponed, selecting the safest route and informing others where you're going and when you expect to arrive.

The campaign ends on March 31, although the winter tire and chain requirement remain in place for select BC highways until the end of April. The Alliance typically gauges the campaign's effectiveness via a third-party research firm to measure advertising recall, perceived effectiveness of ads, as well as attitudes, perceptions and knowledge about winter safe driving practices.

Reference

1 (ICBC Casualty Crashes by Contributing Factor. Driving Too Fast for the Conditions 2013 – 2018. Police Reported Data).

On the expected safety consequences of increasing the speed limit on Ontario 400 series highways from 100 to 110 km/hr.

An evidence-based opinion piece *authored by (in alphabetical order)*:

By
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Alison Smiley is President of Human Factors North Inc. For more than 40 years, she has led research, taught human factors and traffic safety to students, engineers and police, and acted as a human factors expert witness in over 450 legal cases involving motor vehicle crashes.

Résumé
Le Ministère des Transport de l'Ontario envisage d'augmenter la limite de vitesse sur ses autoroutes de série 400 de 100 à 110 km/h. et a lancé des consultations publiques et une étude pilote à ce sujet. Cet article d'opinion fondé sur des preuves (« evidence-based ») est destiné à contribuer à la discussion sur les avantages et les inconvénients de cette proposition du point de vue de quatre experts en sécurité routière représentant les milieux universitaires et le secteur de la consultation. Il décrit l'essentiel des preuves existantes au Canada et dans le monde sur les conséquences probables pour la sécurité de l'augmentation proposée de la limitation de vitesse. Ces preuves devraient être prises en compte et influer sur la décision finale en ce sens qu'elles suggèrent clairement que les collisions seront plus graves et que les blessures et les décès seront plus nombreux si une telle mesure est adoptée.

What motivates this opinion piece?

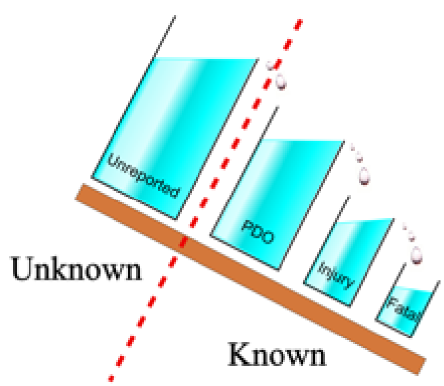
The Government of Ontario is considering increasing the posted speed limit on its 400-series highways[1]. Doing so will have diverse consequences, some beneficial, others harmful. In the short term, people will save time, trucks will be more productive, fuel consumption, and greenhouse gas emissions will increase, seniors may be even more reluctant to use these roads, crashes will be more severe, injuries and fatalities more numerous. In the long run, activities will become even more footloose, land use more decentralized and, as a result, car and truck travel distances will be longer. There is also evidence of spillover increases in speeds on the roads near to where the posted speed limit has been increased.

The authors' expertise is in road safety and our purpose is to put before the decision-makers and the public the extant evidence on what one should expect to be the safety effect of posted speed limit increases in general and the proposed one in particular. We recognize that when setting speed limits, complex considerations and tradeoffs in addition to safety come into play. We believe, however, that what is known about safety consequences should be taken into consideration and influence the eventual decision. This opinion piece is not an exhaustive literature review. Such reviews can be found in the scholarly literature[2].

Do operating speeds increase when posted speed limits are increased?
The obvious effect of raising the posted speed limit is for some to drive a bit faster. Thus, e.g., Hunt et al.[3] report that after Saskatchewan raised the speed limit on four rural highways, in 2003, from 100 km/h to 110 km/h, the average operating speed increased from 107 to 111 km/h. They called the increase "minimal" and "insignificant" and, at first sight, many readers might concur. However, as evidence shows, small increases in mean operating speed are associated with much larger increases in injury and fatal crashes. How much the increase was in Saskatchewan is unknown as, to our knowledge, there are no publicly available safety evaluations. How much the increase will be in Ontario is difficult to predict accurately. Experience elsewhere suggests that a 10 km/h increase in speed limit on high speed highways will result in a 3 – 4 km/h increase in mean operating speed. This is what should be expected. Another likely effect will be an increase in speed diversity. While one can convincingly argue that the more diverse the speeds the more frequent is lane changing and the related turbulence, the literature about the safety effect of speed variance has not yet arrived at a clear consensus.

The potential for safety consequences
It has been argued that faster travel increases the probability of crash occurrence. After all, the stopping distance increases with speed quite dramatically and thereby, so it seems, the ability to avoid crashes must diminish. This "mechanical" view of crash occurrence is overly simplistic. Drivers are not automatons and changes in alertness and other means of adaptation are difficult to observe. Be that as it may, the conjecture that the probability of being involved in a crash increases when speed increases has proven difficult to show by defensible science[4].

On the other hand, there cannot be much doubt that the higher the speed the more severe the consequence of a crash tends to be. Momentum is proportional to speed, and kinetic energy to its square. Both are nullified in a collision when the brain crushes against the skull, the skull against the windshield, the heart and lungs against the ribcage and the body against the seatbelt, airbag or steering wheel. It is just the reality of physics and properties of materials; there is no room for behavioural adaptation. What happens to crash counts is shown in the figure below.



When posted speed limit is increased, and mean speed increases, some crashes that were "injury" before the increase become "fatal", some that were "PDO" (property damage only) turn into "injury", and some that would have been "unreported" (crashes with no injury and damage of less than $2,000 do not have to be reported) spill into the "PDO" category. For every fatal crash in Ontario there are about 75 injury crashes and 320 PDO crashes. Given these proportions one can see that due to the vessel-to-vessel spillage the number of fatal crashes is bound to increase, the number of injury crashes is likely to increase and what will happen to PDO (and therefore Total) crashes is unclear.

Irrefutable published evidence of negative safety consequences
These concepts are validated by irrefutable published evidence from around the world, including some from here in Canada. In British Columbia, posted speed limits were increased by 10 km/h on some 1,300 km of rural provincial highways. A rigorous before-after evaluation led by a prominent researcher using state-of-the art methods found a statistically significant increase in fatal-plus-injury (severe) crashes of 11.1%[5].

Further afield, but as compelling, Elvik[6] summarized and modeled the results of nearly a hundred scientific studies containing empirical estimates of the relationship between the change in mean operating speed and the associated change in crashes or crash victims. The Table below presents some of his results in simplified form.

Outcome	**% change in outcome for 1% change in mean operating speed**
Fatal crashes	4.21, 3.65*
Fatalities	4.90, 4.90
Serious injury crashes	1.35, 1.59
Seriously injured persons	1.59, 1.76
Slight injury crashes	0.90, 1.05
Slightly injured persons	1.64, 1.56
Property Damage Only	1.70, 0.73

*The first entry is for "all studies", the second for "well-controlled studies"

In a subsequent study for the Transportation Research Board[7], more complex statistical models were fitted to Elvik's data in which the percentage increase in crashes for a given increase in mean speed better reflects the original mean speed. If the contemplated posted speed limit increase were to be implemented on the 400-series highways and, as in Saskatchewan, the mean operating speed when traffic is light would increase by 4 km/h from, say, 110 to 114 km/h, these models indicate that injury crashes would increase by about 13% and fatal crashes by about 21%. What may seem to be a moderate increase in mean operating speed is likely to translate into a sizeable increase in fatalities and injuries. These are the facts, and this is what we should expect[8].

Rebutting Counterarguments
Addressing the expected safety consequences of raising posted speed limits, the proponents offer a variety of arguments. Some are entirely without merit and do not deserve comment[9]. Other arguments may appear superficially plausible and require discussion.

One such argument is that the 400-series highways have a design speed of 120 km/h and therefore can safely accommodate the higher speed limit[10]. However, the Ministry of Transportation, Ontario's (MTO's) Design Supplement for the 2017 Transportation Association of Canada Geometric Design Guide for Canadian Roads, which MTO has now adopted, states that "For operational and safety considerations, the design speed should desirably be 20 km/h greater than the posted speed …" and further acknowledges the "… additional margin of safety and capacity normally associated with the desirable design." It does suggest that "An acceptable relation is one where the design speed equals the posted speed" but specifies that "Every effort should be made to use the desirable standard on freeways, arterials and major collectors" (as opposed to the *acceptable* one).

The issue here is the relationship between the "design speed" and safety. The higher the design speed of a road, the more generous are its features, the larger are the radii of horizontal curves, the longer are the sight distances on vertical curves, the milder the grades, etc. Some of these features are explicitly designed so that the large majority of drivers can negotiate them safely. This, of course does not mean that vehicles travelling below the design speed are not involved in crashes; nor does it mean that as long as the posted speed limit remains below the design speed it can be increased without paying the price of more fatalities and injuries. The opposite is true.

Occasionally, a related argument is advanced claiming that if a road is sufficiently improved the posted speed limit on it can be raised without harm to safety[11] This again is untrue. Raising posted speed limits causes speed to increase and this, in turn, inevitably increases crash severity. If the improvement to the road (such as twinning) enhanced safety this was a safety gain. If a subsequent increase in the posted speed limit undoes this gain, this is a safety loss. It is also sometimes argued that raising the posted speed limit will do no harm if by enforcement one ensures that there will be no speeding. That can be true. For example, there is some evidence that the introduction of automated speed enforcement has helped to reduce the number of crashes. However, for that to be true in the case of the proposed posted speed limit increase in Ontario one has to either commit to a comprehensive photo radar system on the 400-series highways or to a massive and sustained increase in the police force devoted to speed enforcement.

Summary

This evidence-based position paper is in response to an Ontario Government proposal to increase the posted speed limit on its 400-series highways from 100 to 110 km/h. Saskatchewan and B.C. have recent experiences with posted speed limit increases. In Saskatchewan, an increase from 100 to 110 km/h on four rural highways resulted in an increase in average operating speed of 4 km/h. The effect on safety there is unknown as, to our knowledge, there are no publicly available safety evaluations. Although there are good reasons to expect that increasing speed will increase the probability of collisions, this has been difficult to prove. What is indisputable, however, is that increased operating speed is associated with increased crash severity. The result is that some collisions that resulted in "non-fatal injury" become "fatal" and some "property damage only" become "injury". A rigorous evaluation led by a prominent researcher in B.C., where posted speed limits were increased by 10 km/h on some 1,300 km of rural provincial highways, found a statistically significant increase in fatal-plus-injury crashes of 11.1%.

A Transportation Research Board study developed statistical models based on nearly a hundred studies, to estimate the relationship between the change in mean speed and the associated change in crashes and crash victims. If the contemplated posted speed limit increase were to be implemented on the 400-series highways and, as in Saskatchewan, the mean operating speed when traffic is light would increase by 4 km/h from, say, 110 to 114 km/h, these models indicate that injury crashes would increase by about 13% and fatal crashes by about 21%. Thus, what may seem to be a moderate increase in mean speed is likely to translate into a sizeable increase in injuries and fatalities.

Some argue that raising the posted speed limit will do no harm if by enforcement one ensures that there will be no speeding. However, past experience tells us that this would require a comprehensive photo radar system on the 400-series highways or a massive and sustained increase in the police force devoted to speed enforcement.

We recognize that when setting speed limits, complex considerations and tradeoffs in addition to safety come into play. We believe, however, that what is known about safety consequences should be given strong consideration and influence the eventual decision on raising speed limits on the 400-series highways.

References

1 https://www.ontario.ca/page/consultation-speed-limits-ontario-highways

2 See e.g., K. Kockelman, Safety Impacts and Other Implications of Raised Speed Limits on High-Speed Roads. NCHRP Web-Only Document 90 (Project 17-23): Contractor's Final Report, https://safety.fhwa.dot.gov/speedmgt/ref_mats/fhwasa1304/Resources3/22%20%20Safety%20Impacts%20and20Other%20Implications%20of%20Raised%20Speed%20Limits%20on%20High-Speed%20Roads.pdf or Charles M. Farmer, The Effects of Higher Speed Limits on Traffic Fatalities in the United States, 1993–2017 April 2019. Insurance Institute for Highway Safety https://www.iihs.org/api/datastoredocument/bibliography/2188,
See also references in notes 5 and 6.

3 Hunt, P., B. Larocque and W. Gienow (2004). Analysis of 110 km/h Speed Limit: Implementation on Saskatchewan Divided Rural Highways, 2004 Annual Conference of the Transportation Association of Canada. Québec City, Québec. http://conf.tac-atc.ca/english/resourcecentre/readingroom/conference/conf2004/docs/s16/p-hunt.pdf.

4 See, e.g., quoting Shinar (D. Shinar. Speed and Crashes: A Controversial Topic. Appendix B in "Managing Speed, Special Report 254, Transportation Research Board, Washington D.C., 1998. pp. 221-276.) "From a very simplistic point of view it appears that as speed increases, the time to react to emerging dangers is shortened, and the likelihood of successfully coping with the imminent crash situation decreases. Also, even after the driver reacts by braking, the braking distance of the vehicle is proportional to the square of pre-braking speed. .... But reality is much more complicated, both theoretically and empirically." (5, p. 231). After reviewing the extant evidence Shinar concludes that: "In summary, with the exception of one small study ..., none of the observational/correlational studies that have been reviewed were able to measure empirically or statistically control for all the potential factors that mediate speed and crash probability." (5, p. 251).

5 Tarek Sayed, Emanuele Sacchi, Evaluating the Safety Impact of Increased Speed Limits on Rural Highways in British Columbia, Accident Analysis and Prevention 95 (2016) 172–177.

6 Rune Elvik (2005) Speed and Road Safety, Synthesis of Evidence from Evaluation Studies. Transportation Research Record: Journal of the Transportation Research Board, No. 1908, Transportation Research Board of the National Academies, Washington, D.C., 2005, pp. 59–69.

7 Table F19 of Harkey, D.L., et al., 2008. Accident modification factors for traffic engineering and ITS improvements. National Cooperative Highway Research Program (NCHRP) Report 617, Transportation Research Board. (Models cited are given in Equations 47 and 48 on page 47 of Appendix F.).

8 On September 26, 2019, as a "pilot" project, Ontario raised the speed limit to 110 km/h on three road sections 224 kilometers in length. Here, too, one should expect a sizeable increase in fatalities.

9 For example, a petition asking Alberta to adopt 120 km/h speed limits claiming to be endorsed by more than 11,000 signatories claims that "According to the studies done in province of British Columbia and all other places in United States, it was clearly revealed that when speed limits are increased, the amount of collisions go down significantly". https://www.change.org/p/government-of-alberta-raise-alberta-highway-s-speed-limit-to-120

10 The Ontario Minister of Transportation is quoted saying that "Our roads are built and designed — the 400-series highways, provincial highways — to carry it at 120 kilometers an hour safely, so we've got to make sure that we keep that in mind with regards to speed limits." https://toronto.citynews.ca/2019/05/01/ontarios-transportation-minister-raises-possibility-of-higher-speed-limits/. In announcing public consultations on the matter the MTO says "Safety is the government's number one priority and each pilot location was carefully chosen based on a number of factors, including its ability to accommodate higher speed limits."

11 Before raising the speed limit to 110 km/h the Saskatchewan transportation minister was quoted saying that ""…the massive investment we've made to accelerate twinning means that our four-lane highways can accommodate an increased speed limit," and that "Through this investment we are now in a position to move people and goods as quickly and efficiently as possible while, at the same time, ensuring safety." (June 1, 2003 by Truck News, https://www.trucknews.com/features/sask-speed-limits-increased-to-110/

Recent Advances in EDR Technology

By Jean-Louis Comeau and Alan German

Jean-Louis is the Chief of Transport Canada's Collision Investigations and Research Division. Alan is a past Chief of this same research group. These individuals have been involved in research on the application and utility of Event Data Recorders (EDR), both in staged-crash tests and in real-world collision investigations, as these devices have developed over the past several years.

Résumé
L'introduction de véhicules entièrement autonomes dans le parc de véhicules signifiera qu'à l'avenir, les manoeuvres de véhicules seront régies par des systèmes de prise de décision automatisés, plutôt que par des conducteurs. En fait, c'est déjà le cas bien souvent aujourd'hui, en raison de la présence de plus en plus importante des systèmes avancés d'aide à la conduite. Compte tenu de cette tendance, il est impératif que les systèmes de détection et de contrôle associés aux systèmes automatisés soient surveillés de près et que leurs actions soient enregistrées, afin de pouvoir évaluer leur performance à la suite d'événements imprévus, telles que les collisions. Dans cet article, nous examinons certaines des dernières fonctionnalités propres aux enregistreurs d'événement qui facilitent ce processus.

The potential introduction of fully-autonomous vehicles into the vehicle fleet means that, in future, many vehicle manoeuvres will be governed by automatic systems rather than by vehicle drivers. In fact, this is often the case today due to the increasing implementation of Advanced Driver Assistance Systems (ADAS) in production vehicles. These trends make it imperative that the sensing and control systems associated with on-board automated systems are carefully monitored, and their actions fully recorded, so that their performance can be evaluated following any unexpected event such as a collision. In this article we look at some of the latest features of Event Data Recorders (EDR) that facilitate this process.

On-board crash recorders have evolved considerably from their initial implementation as a set of fuses to record the deployment of the first airbag systems. Significant enhancements to the capabilities of EDR's arrived with the introduction of microprocessor-based systems in the 1990's. This generation of EDR's typically captured a range of pre-crash data, such as vehicle speed (mph), engine speed (rpm), brake-switch status (on/off), accelerator position and throttle opening (%). These variables were recorded at each of five, one-second intervals prior to the occurrence of a crash. The seat-belt status (buckled/unbuckled) for both the driver and right-front passenger were also captured, as were the firing times (ms) for the single-stage, front airbags. Collision severity was recorded through time–series measurements, at 10 ms intervals, typically for a duration of 150-300 ms, of the vehicle's longitudinal change in velocity (ΔV).

Today's EDR's are sophisticated electronic devices that capture a much more comprehensive range of both pre-collision and crash-related data. These data are thus extremely useful in indicating the actions of both a driver and any on-board automated control systems that precede a crash. Similarly, parameters related to the crash severity, and the deployment of restraint technologies such as seat belt pre-tensioners, load limiters, multi-stage front airbags, side airbags, curtains, and knee bolsters, offer considerable insights into the performance of these safety systems, and the levels of injury mitigation that they provide. Indeed, the inputs to the automated control systems and the resulting vehicle responses, and the precise nature of the deployment regime for pyrotechnic restraint system components, would not be known without such detailed recorded information.

As such, these data are invaluable to the automotive engineers who design vehicle safety systems in order that they can fully understand their real-world system performance and make any necessary enhancements. EDR's also provide a wealth of collision-related data that can be used by researchers to explore wide-ranging safety issues, and by regulators to identify opportunities for improving vehicle safety features.

An example of the data captured by an EDR in a recent-model vehicle is highlighted through the following case study of a real-world collision.

A late-model pickup truck was travelling westbound, during daylight hours, along a six-lane, median-divided highway. The asphalt-paved roadway was dry and the weather was clear. The roadway had a slight incline and was curved prior to the impact location, but then became straight and level. Traffic was light and the pickup's driver estimated that the closest vehicle was approximately four vehicle lengths ahead. As the pickup continued along the middle lane of travel, it was overtaking slower-moving vehicles in both adjacent lanes.

Suddenly, the driver heard an alert issued by the vehicle's Forward Collision Warning (FCW) system and became aware that the vehicle was undergoing heavy braking. He indicated that there was no vehicle or object in close proximity to the pickup, yet the braking was such as to bring his vehicle to a complete stop on the highway.

Figure 1. Operation of Forward Collision Warning System

The driver of a tractor-trailer combination, who was following the pickup truck, was unable to brake sufficiently to avoid a collision, and the tractor-trailer struck the rear of the pickup. The seat-belt pre-tensioners for the pickup's driver activated on impact, but no airbags were deployed. The rear-end collision was of minor severity and neither driver sustained any injury.

The report obtained from the pickup truck's EDR contained a wealth of data relating the collision, including the driver's occupant-restraint status, the vehicle's ΔV and, most importantly, a wide range of information on pre-crash factors relating to the FCW system and the brake application.

System Status at Event (Most Recent Event - Deploym

Event Number	
Complete File Recorded	
Ignition Cycle, Crash	
Multi-Event, Number of Event	
Time From Event 1 to 2 (sec)	
Safety Belt Status, Driver	Buc
Safety Belt Status, Passenger	Unbuc
Seat Track Position Switch, Foremost, Status, Driver	Not Frontal :
Seat Track Position Switch, Foremost, Status, Right Front Passenger	Not Frontal :
Occupant Size Classification, Outboard Front Passenger	(
Maximum Delta-V, Longitudinal (MPH [km/h])	11.8
Time, Maximum Delta-V, Longitudinal (ms)	
Maximum Delta-V, Lateral (MPH [km/h])	0.
Time, Maximum Delta-V, Lateral (ms)	
Frontal Airbag Warning Lamp	
Operation system time (min)	
Airbag Warning Lamp On Time (min)	
Total Number of Events	

Deployment Command Data (Most Recent Event - Deployme

Frontal Airbag Deployment, 1st Stage, Driver	
Frontal Airbag deployment, Time to Deploy 1st stage, Driver (ms)	
Frontal Airbag Deployment, 2nd Stage, Driver	
Frontal Airbag deployment, Time to Deploy 2nd stage, Driver (ms)	
Frontal Airbag Deployment, 3rd Squib, Driver	
Frontal Airbag deployment, Time to Deploy 3rd Squib, Driver (ms)	
Frontal Airbag, Deployment 1st Stage, Passenger	
Frontal Airbag deployment, Time to Deploy 1st stage, Passenger (ms)	
Front Airbag, Deployment 2nd Stage, Passenger	
Front Airbag, Time to Deploy 2nd stage, Passenger (ms)	
Front Airbag, Deployment 3rd Squib, Passenger	
Front Airbag, Time to Deploy 3rd Squib, Passenger (ms)	
Adaptive Load Limiter Deployment, Driver	
Retractor Pretensioner Deployment, Driver	
Anchor Pretensioner Deployment, Driver	
Adaptive Load Limiter Deployment, Passenger	
Retractor Pretensioner Deployment, Passenger	
Anchor Pretensioner Deployment, Passenger	
Side Seat Airbag Deployment, Front Left	
Side Curtain Airbag Deployment, Left	
Side Seat Airbag Deployment, Front Right	
Side Curtain Airbag Deployment, Right	

Figure 2. Occupant Restraint System Status/and Deployment Characteristics

The tables shown in Figure 2 confirmed that the pickup truck driver's seat belt was buckled, that the pre-tensioners on both the seat belt retractor and anchorage were activated, none of the stages of the front airbag and neither the side airbag nor the side curtain were deployed.

As the pickup truck was pushed forwards, the maximum longitudinal ΔV for the rear-end impact was noted as being 19 km/h (11.8 mph) with a duration 72 ms. There was no lateral component to the vehicle's change in velocity. The longitudinal crash pulse is shown in Figure 3.

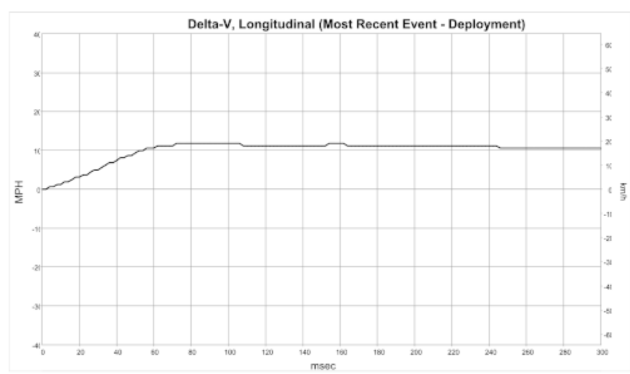


Figure 3. Longitudinal Delta-V (mph)

The EDR in the pickup truck recorded a wide range of pre-crash data at 0.1 s intervals for a period of 5 s prior to the occurrence of the rear-end impact. A graphical depiction of the engine rpm, vehicle speed (mph), the brake status (on/off), the activation of the accelerator pedal (%) and throttle (%) is shown in Figure 4.

The vehicle can be seen to be slowing very gently from t = -5 s to t = -1.8 s. In the initial portion of this time period, there was activation of the braking system by the driver between t = -5 s and t = -3.7 s. There was no further brake application until t = -0.5 s. The accelerator pedal was depressed to a maximum of approximately 14% between t = -2.8 s and t = -1.5 s and thereafter left untouched. It should be noted that the service brake parameter relates specifically to depression of the brake pedal by the vehicle's driver. Braking due to intervention by the FCW system is not reported through this data element.

Between t = -1.8 s and t = -0.6 s, the associated tabular data (Figure 5) show that vehicle's speed dropped from 29 km/h to 3 km/h; however, there was no activation of the service brakes by the vehicle's driver during this time period. Nevertheless, the vehicle's deceleration averaged 0.9 g which, for ABS and the dry asphalt roadway, is indicative of full brake application and an emergency stop procedure.

Additional information relating specifically to the FCW system is contained in a second table of pre-crash data. The relevant portion of this table is shown in Figure 6. In particular, note that between t = -1.2 s and t = -0.8 s the parameter "Braking System, Maximum Braking" was set as "Yes" indicating that the vehicle's brakes were being applied.

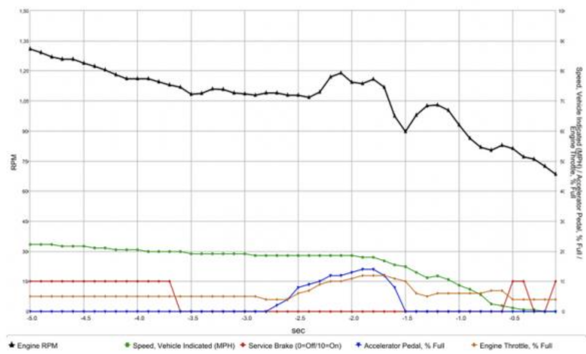


Figure 4. Pre-Crash Data (-5.0 to 0 s)

A number of other items of note to the current collision situation that are recorded elsewhere in the pre-crash data are that the FCW system was fully on with active braking as well as the audible and visual warnings enabled. The vehicle's regular cruise control and Adaptive Cruise Control (ACC) systems were not engaged. There was little to no steering input by the driver. Of particular note was that the pressure in the master cylinder was zero during the period t = -3.6 s to t = -0.5 s which corresponds to the indication that the driver did not apply the service brakes during this time period.

Time (sec)	Pre-Crash Recorder Status	Speed, Vehicle Indicated (MPH [km/h])	Accelerator Pedal, % Full (%)	Engine Throttle, % Full (%)	Service Brake	Engine RPM (RPM)	ABS Activity	Stability Control
-2.0	Complete	18.6 [30]	13	11	Off	1,144	No	On
-1.9	Complete	18.0 [29]	14	12	Off	1,136	No	On
-1.8	Complete	18.0 [29]	14	12	Off	1,158	No	On
-1.7	Complete	16.8 [27]	12	12	Off	1,120	No	On
-1.6	Complete	15.5 [25]	8	11	Off	974	No	On
-1.5	Complete	14.9 [24]	0	10	Off	897	No	On
-1.4	Complete	13.0 [21]	0	6	Off	980	No	On
-1.3	Complete	11.2 [18]	0	5	Off	1,025	No	On
-1.2	Complete	11.8 [19]	0	6	Off	1,030	No	On
-1.1	Complete	10.6 [17]	0	6	Off	1,004	No	On
-1.0	Complete	8.7 [14]	0	6	Off	930	No	On
-0.9	Complete	7.5 [12]	0	6	Off	865	No	On
-0.8	Complete	5.6 [9]	0	6	Off	820	No	On
-0.7	Complete	2.5 [4]	0	7	Off	804	No	On
-0.6	Complete	1.9 [3]	0	7	Off	829	No	On
-0.5	Complete	1.2 [2]	0	4	On	814	No	On
-0.4	Complete	0.6 [1]	0	4	On	770	No	On
-0.3	Complete	0.6 [1]	0	4	Off	760	No	On
-0.2	Complete	0.0 [0]	0	4	Off	725	No	On
-0.1	Complete	0.0 [0]	0	4	On	684	No	On

Figure 5. Portion of the Pre-Crash Data

Time (sec)	Pre-Crash Recorder Status	Braking System, Maximum Braking	Wheel Speed, LF (RPM)	Wheel Speed, RF (RPM)	Wheel Speed, LR (RPM)	Wheel Speed, RR (RPM)	Yaw Rate (deg/sec)	Object of Interest Distance (m)
-2.0	Complete	No	203	207	203	199	1.28	1
-1.9	Complete	No	199	202	196	199	0.16	11
-1.8	Complete	No	193	192	196	195	0.64	11
-1.7	Complete	No	186	185	189	183	-0.40	11
-1.6	Complete	No	175	172	169	179	-1.04	11
-1.5	Complete	No	154	160	157	164	-0.80	11
-1.4	Complete	No	142	140	144	140	-0.16	11
-1.3	Complete	No	101	109	123	108	-0.24	11
-1.2	Complete	Yes	112	15	101	100	0.16	11
-1.1	Complete	Yes	90	99	89	89	-1.44	11
-1.0	Complete	Yes	74	71	72	71	0.72	11
-0.9	Complete	Yes	57	54	55	32	0.56	11
-0.8	Complete	Yes	35	39	42	41	-0.48	11
-0.7	Complete	No	25	24	25	24	-0.24	5
-0.6	Complete	No	15	15	18	18	-0.40	5
-0.5	Complete	No	9	8	10	11	-0.32	6
-0.4	Complete	No	0	6	6	6	-0.24	6
-0.3	Complete	No	0	0	0	0	-0.16	6
-0.2	Complete	No	0	0	0	0	-0.72	7
-0.1	Complete	No	0	0	0	0	-0.56	8

Figure 6. Additional Pre-Crash Data Elements

The other parameter of special note with regard to activation of the FCW system is the "Object of Interest Distance (m)". This is a measure of the headway between the pickup truck and the main object being tracked by the FCW system. The specific values recorded as a function of time are shown in Figure 7.

Initially, the headway was maintained at approximately 11 m. The headway then dropped to about 6 m for 0.7 s. The headway was briefly recorded, for a single interval (at t = -2.6 s), at 197 m, followed by a period of 0.6 s (from t = -2.5 to t = -2.0 s) when the headway was reduced to between 1 and 2 m. Subsequently, the headway remained at 11 m from t = -1.9 s to t = -0.8 s, and between 5 and 8 m, after that the highlighted row in Figure 7 for t = -1.2 to -0.8 s corresponds to the activation of the FCW system and the hard-braking event.

t (s)	d (m)
-5.0 to -3.4	10 to 11
-3.3 to -2.7	5 to 6
-2.6	197
-2.5 to -2.0	1 to 2
-1.9 to -1.3	11
-1.2 to -0.8	11
-0.7 to -0.1	5 to 8

Figure 7. Object of Interest Distance

It is clear from the data captured by the EDR in the pickup truck that the FCW activated and abruptly reduced the vehicle's travel speed to near zero in under two seconds. The tractor-trailer following close behind the pickup could not match the pickup's deceleration and the rear-end collision resulted.

The pickup truck's driver maintained that there was no vehicle or object close in front of his vehicle, in which case the FCW system should not have engaged the vehicle's brakes. This seems to be borne out by the EDR indicating a headway of at least 10 m for up to 0.7 s before the hard-braking event occurred. However, the situation is confounded somewhat by the headway measurements immediately prior to this time period where the values go from 197 m for a single 0.1 s sampling interval to between 1 and 2 m over a period of 0.6 s.

The on-road situation, or the vehicle sensing condition, that gave rise to the above-noted headway values is not clear. Certainly, an object appearing abruptly within 1 to 2 m of the front of the subject vehicle might well cause the FCW to engage. However, this scenario is at variance with the statement of the vehicle driver that the road ahead was clear and, in particular, that no vehicle was attempting to cut in front of the pickup truck.

As of the time of writing, the specific circumstances of the case collision remain unresolved. Nevertheless, given the wide-ranging nature of the information provided by the EDR in this case, it is clear that the current generation of these devices are of considerable utility in understanding the real-world performance of automated vehicle systems. And, no doubt, as these devices evolve even further, they will become an invaluable tool to enhance safety.

For more information on the operation of Forward Collision Warning (FCW) systems, and other ADAS devices, see the article *Advanced Driver Assistance Systems* elsewhere in this issue.

Brief overview of some of the advanced driver assistance systems (ADAS)

By Alan German, Road Safety Research

Alan is a Research Scientist with Road Safety Research in Ottawa, Ontario. He is a Past President of CARSP and a current member of CARSP's Editorial Board. A long-time proponent of high-tech motor-vehicle systems, Alan is currently looking forward to acquiring a vehicle equipped with ADAS.

Résumé
Il y a eu beaucoup de discussions, ces dernières années, autour des véhicules autonomes. Toutefois, bien qu'ils sont actuellement en développement et, dans certains cas, soient soumis à des tests routiers, le potentiel des véhicules autonomes reste à exploiter. Il faut également reconnaître qu'un certain nombre de technologies a déjà fait son apparition dans le parc de véhicules. Commercialisés sous l'appellation ADAS (Advanced Driver Assistance Systems), les systèmes avancés d'aide à la conduite font partie intégrante de plusieurs véhicules de série.

There has been much discussion in recent years on the topic of autonomous vehicles; however, while these are under active development and even, in some cases, are on the road as limited test fleets, their full potential has yet to be exploited. Nevertheless, a number of the underlying technologies and sub-systems are making their way into the current vehicle fleet. Marketed as Advanced Driver Assistance Systems (ADAS), many current production vehicles are equipped with a variety of such high-tech systems.

The process of automating the driving task with a view to making vehicle travel safer has been in progress for a number of years. We are now familiar with the availability of in-vehicle safety systems such as anti-lock brakes (ABS) and electronic stability control (ESC) and, indeed, these technologies are standard equipment in all new passenger vehicles. In recent years there has been an industry-wide trend to equip vehicles with a range of similar technologies, all aimed to further assist vehicle operators with the driving task.

Commonly available systems in current production vehicles include adaptive cruise control, forward collision warning, pedestrian detection, automatic emergency braking, backup cameras, blind spot monitoring, lane departure warning and lane keeping assistance systems. Often, several such systems are bundled in optional packages, or included as increasing levels of standard equipment in the more expensive models for any given vehicle platform. The output of these systems varies with the specific device and vehicle manufacturer and can involve one or more of audio or visual warning signals, hepatic feedback, and automatic activation of vehicle control systems.

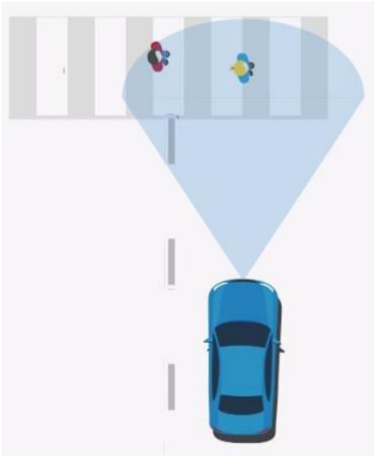
Adaptive Cruise Control
The essence of Adaptive Cruise Control (ACC) is for the vehicle to maintain a set distance between itself and any vehicle ahead. The vehicle driver sets the desired speed that is to be maintained as is the case for regular cruise control. The ACC system then monitors the road ahead, typically using radar or laser-based ranging (LIDAR) sensors and/or front-facing cameras, to detect the presence of other vehicles. Should any such vehicle be moving more slowly than the subject vehicle, the ACC system will adjust the throttle and/or apply the brakes in order to match the other vehicle's speed and maintain the set headway.

Should the other vehicle accelerate, or turn off the roadway, such that the path ahead is clear, the ACC will automatically bring the subject vehicle back up to the set speed. Some systems take this technology to another level by providing a "stop-and-go" feature for use in dense traffic. These systems are capable of following slow-moving traffic, including bringing the vehicle to a complete stop if necessary, and then continuing ahead when the traffic begins to flow again.

Forward Collision Warning

This active safety system builds on the technology underlying ACC. The vehicle's forward-looking sensors and their control system determine relative speed and headway and identify if there is potential for a collision with a vehicle ahead. For example, the lead vehicle may be forced into a hard-braking situation, due to some sort of hazard, and slow down very rapidly. If the Forward Collision Warning (FCW) system on the subject vehicle considers that a collision is imminent it will apply the vehicle's brakes automatically. Depending on the system, this may be at a level sufficient to bring the vehicle to a halt or, at a minimum, enough to reduce the impact speed and hence the collision severity.

Pedestrian Detection



Pedestrian detection systems are yet another extension of the above-noted technologies. Forward-looking radar or LIDAR sensors may be combined with on-board digital cameras and image-processing systems.

The image-processing system identifies external road users, typically pedestrians and cyclists, tracks their motion in real time, and predicts potential conflicts.

In particular, should the system determine that a pedestrian or cyclist is in the vehicle's path of travel, it will issue an alert to the vehicle driver and, if necessary, will apply the vehicle's brakes in an attempt to avoid impact.

Backup Cameras

Backup camera in-dash display

As of May 2018, every new light-duty vehicle in Canada must be equipped with a Rear Visibility System (RVS). Commonly known as a backup camera, the system uses a video camera mounted at the rear of the vehicle that is activated automatically when the driver engages reverse gear.

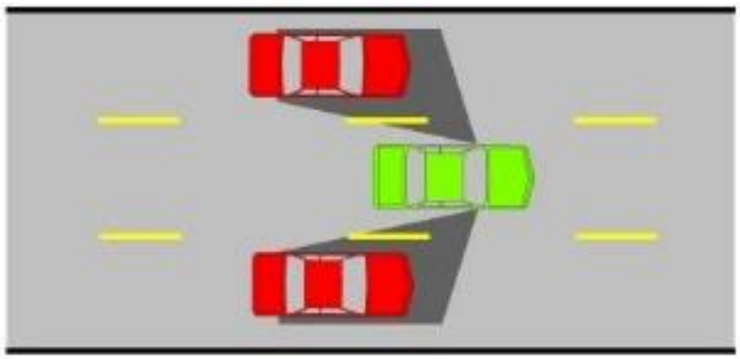
The camera provides a wide-angle view to the rear of the vehicle, with the image being displayed either on a video screen mounted in the dashboard (which may form part of the vehicle's information system) or in a small display in the rearview mirror.

The view to the rear assists the driver when backing up and, in particular, helps to avoid impacts with any individuals (notably small children) or objects in the vehicle's path.

Blind Spot Monitoring

Even with properly adjusted side mirrors, an overtaking vehicle may enter a region outside of the driver's view to the side and rear of the vehicle. Termed a "blind spot", electronic sensors are typically employed to automatically identify objects in such locations and issue a warning.

Blind spot detection systems normally use either radar or rear-looking video cameras to detect vehicles in the driver's blind spot. Detectors are located on both sides of the vehicle to facilitate safe lane change manoeuvres. The system only identifies objects in close proximity to the vehicle, and may only activate if the driver uses a turn signal when another vehicle is in a blind spot.



Vehicles in the driver of the green car's blind spot are detected and the driver alerted that it is not safe to change lanes

Generally, the system will illuminate a warning light, often located on the appropriate side mirror, to advise the driver of the presence of the adjacent vehicle. Other systems vibrate the steering wheel or seat if the driver attempts to initiate an unsafe passing manoeuvre.

Some systems extend blind spot detection to provide rear cross-traffic alerts. Side-facing sensors at the rear of the vehicle are used to detect vehicles travelling essentially at right angles to a vehicle that is reversing. The driver is alerted to the presence of such cross traffic in order to avoid any potential collision.

Lane Departure Warning and Lane Keeping Assistance Systems

Lane departure warning systems usually employ a forward-facing camera to monitor the roadway ahead. An image-processing system attempts to identify roadway markings and road edge delineators and so define the vehicle's travel lane. Should the vehicle's predicted path be such that it would leave the current travel lane, when the driver has not activated a turn signal, a warning signal is issued. Some systems also vibrate the steering wheel.

Lane keeping assistance systems extend the above approach by automatically taking some measure of corrective action. Typically, the system applies gentle steering inputs, as necessary, to maintain the vehicle's path down the centre of

Note that, while ADAS can help with the driving task, users must be aware of the limitations imposed by such issues as inclement weather, darkness, glare, a lack of clear lane markings, etc.

Research on advanced safety systems for practitioners

By Martin Lavallière, Ph.D., Université du Québec à Chicoutimi Lab BioNR and CISD

CARSP, in collaboration with Professor Martin Lavallière from Université du Québec à Chicoutimi, was recently awarded a grant by the Ministère des Transport du Québec with its « Programme d'aide financière du Fonds de la sécurité routière » for the project "Creation of a scientific watch on active and passive safety technologies for road safety professionals" (« Création d'une veille scientifique sur les technologies de sécurité active et passive pour les professionnels en sécurité routière »). This represents an opportunity for CARSP to enhance its website regarding the active and passive technologies available in current vehicles and broader knowledge among road safety professionals and the public regarding this sector in road safety.

Despite road safety records that are improving year after year, Canada still faces a high number of road users who are killed or severely injured in a road collision. A recent public consultation conducted jointly by the SAAQ and the MTMDET reminds us that the population consider road safety as a major issue in today's society and that we have different opportunities to improve road safety in Canada.

This bilingual interactive online tool will benefit the road safety community through better methods to understand and discuss the implications of active and passive technologies for road safety. This scientific watch provides a framework for identifying and documenting them as a point of reference for consultation and discussion in a technology neutral way. A schedule showing market penetration rates will be possible to assess the extent of each of them on road safety. The tool will include various online elements, such as links to the scientific literature, and descriptive text on these technologies, and variables collected in the literature by types of measures as identified in the literature. These variables have already been established in terms of quantitative and qualitative measures in a CIHR-funded review [1,2].

In the first year of the project, a consultation will be held with various road safety professionals, including you, to determine the format in which they prefer the information to be presented on the website and the frequencies at which the information should be updated, and made available. The automation of the identification of the scientific literature will be carried out in order to populate the various sections of the site by technologies. In the second year, the scientific watch will be made available to the general public and presented in various conferences and events in Canada and at international scientific conferences in road safety. Various initiatives have been put in place in the past to provide a clearer picture of the technologies available, but these initiatives often remain vague and mainly assess the level of trust in these technologies without, however, assessing their potential and drawbacks (real efficiencies in situations where they do or do not work). When dealing with a subject, it is essential to have enough information to make informed decisions and to avoid making mistakes in setting up programs or information for the population. A well-designed, targeted scientific watch will provide adequate coverage of scientific publications on the subject, as well as consolidate information on a single portal for road safety professionals. We believe that this project will reach one of the most important target audiences in the deployment of such technologies, the road safety professionals. Such initiatives already exist in other advanced fields such as occupational health and safety (eg the IRSST with https://www.irsst.qc.ca/publications-et-outils/veille-sst) and it is time for such a tool to be available to stakeholders in Canada.

This project has the advantage of not only being made available to professionals in the field but also to the general public. Thus, the general public can also use the various information collected on the site to help create and develop a more educated consumer base in Canada. Since the CARSP web platform is bilingual, the information collected will be disseminated in both French and English and will be able to reach the largest possible audience. It is important to specify here that only the technologies embedded in the vehicle will be identified and evaluated. This work will not address technologies associated with vehicle-to-vehicle (V2V) or infrastructure-to-infrastructure (V2I) communications. These latter technologies are more associated with the road infrastructure and are not currently being promoted by major automakers.

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[1]Furlan, A., Vrkljan, B., Abbas, H. H., Babineau, J., Campos, J., Haghzare, S., . . . Lavallière, M. (2018, September 23–25). *The impact of advanced vehicle technologies on older driver safety: a scoping review of subjective outcomes.* 10th International ACM Conference on Automotive User Interfaces and Interactive Vehicular Applications (AutomotiveUI '18), Toronto, On.

[2]Lavallière, M., Vrkljan, B., Abbas, H. H., Babineau, J., Campos, J., Haghzare, S., . . . Furlan, A. (2019). *Comment les systèmes de sécurité active actuellement disponibles permettent d'entrevoir la voiture du futur pour les conducteurs vieillissants*. 2e Rencontres Francophones Transport Mobilité (RFTM), Montréal (Qc).

Recherche sur les systèmes de sécurité avancée pour les professionnels

By Martin Lavallière, Ph.D., Université du Québec à Chicoutimi Lab BioNR and CISD

CARSP, en collaboration avec le Professor-chercheur Martin Lavallière de l'Université du Québec à Chicoutimi, a récemment obtenu une subvention du Ministère des Transport du Québec dans le cadre du « Programme d'aide financière du Fonds de la sécurité routière » pour le projet « Création d'une veille scientifique sur les technologies de sécurité active et passive pour les professionnels en sécurité routière » ("Creation of a scientific watch on active and passive safety technologies for road safety professionals"). Le tout représente une opportunité unique CARSP de bonifier son site web actuel en ce qui a trait aux technologies actives et passives en regard à la prévention des collisions routières dans les véhicules disponibles sur le marché et ainsi, diffuser ces savoirs à la communauté de professionnels en sécurité routière et le grand public.

Cet outil en ligne interactif bilingue bénéficiera à la communauté en sécurité routière de par de meilleures méthodes pour comprendre et discuter des implications des technologies actives et passives sur la sécurité. Cette demande présente un cadre de travail afin de recenser et documenter celles-ci comme un point de référence pour consultation et discussion de manière neutre vis-à-vis la technologie. Un calendrier indiquant les taux de pénétrations du marché sera possible afin d'évaluer l'ampleur de chacune d'elle sur la sécurité routière. L'outil comprendra divers éléments en ligne, tels que des liens vers la littérature scientifique, et du texte descriptif sur les dites technologies, et les variables colligées dans la littérature par types de mesures tel qu'identifiés dans la littérature. Ces variables ont déjà été établis en termes de mesures quantitatives et qualitatives dans une recension financée par les IRSC (Furlan et al., 2018; Lavallière et al., 2019).

Dans la première année, une consultation aura lieu auprès de différents professionnels en sécurité routière afin de déterminer le format sous lequel il préfère que l'information leur soit présentée sur le site web ainsi que la fréquence à laquelle l'information devrait être mises à jour et rendue disponible. L'automatisation de l'identification de la littérature scientifique sera effectuée afin de peupler les différentes sections du site par technologies. À la deuxième année, la veille scientifique sera rendu disponible aux professionnels et au grand public et présenté dans différentes conférences et évènements au Canada et lors de conférences scientifiques internationales en sécurité routière.

Différentes initiatives ont été mises en place par le passé afin de dresser un portrait plus clair des technologies disponibles mais ces initiatives demeurent souvent vagues et font principalement une évaluation du niveau de confiance face à ces technologies sans toutefois évaluer leurs efficacités réelles où les situations où elles fonctionnent ou ne fonctionnent pas. Lorsque l'on aborde un sujet, il est essentiel de disposer de suffisamment d'informations pour prendre des décisions éclairées et éviter ainsi de se tromper dans la mise en place de programme ou d'informations à la population. Une veille scientifique ciblée et conçue de façon adéquate permettra une couverture adéquate des publications scientifiques sur le sujet en plus de regrouper les informations sur un même portail pour les professionnels en sécurité routière. Nous croyons que ce projet atteindra l'un des publics cibles les plus importants dans le déploiement de telles technologies, les professionnels en sécurité routière. De telles initiatives existent déjà dans d'autres domaines de pointe comme la santé et sécurité au travail (ex. l'IRSST avec https://www.irsst.qc.ca/publications-et-outils/veille-sst) et il est temps qu'un tel outil soit disponible aux intervenants du Québec.

Ce projet présente l'avantage de ne pas concerner seulement les professionnels car le portail web sera aussi disponible au grand public. Ainsi, le grand public pourra aussi utiliser les différentes informations colligées sur le site afin de contribuer à créer et à développer une base de consommateurs plus instruits au Canada. Puisque la plateforme Web de l'ACPSER est bilingue, les informations recueillies seront ainsi diffuser tant en français qu'en anglais et pourront ainsi rejoindre la plus grande audience possible. Il importe de spécifier ici que seules les technologies embarquées à même le véhicule seront recensées et évaluées. Le présent travail n'adressera pas les technologies associées aux communications véhicules à véhicules (V2V – Vehicles to vehicles) ou véhicules à infrastructures (V2I – Vehicles to infrastructures). Ces dernières technologies relèvent plus de l'infrastructure et / ou ne sont pas actuellement mise de l'avant par les grands constructeurs d'automobiles.

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Safety Network Newsletter (SNN) Editorial Committee Members

In 2020, the SNN Editorial Board will welcome two new members:

Robert Colonna

Robert Colonna recently completed his MSc and is now beginning his doctoral work supervised by Dr. Liliana Alvarez, in the Health and Rehabilitation Sciences program at Western University, London, Ontario. He is a research assistant in the i-Mobile Research Lab and is involved in many student volunteer and leadership initiatives within and outside the University, including the CARSP Young Professionals' Committee. Prior to his MSc, Mr. Colonna completed an Honours Bachelor degree in Health Sciences at Western University, with a Specialization in Health Promotion and Minor in Economics. Mr. Colonna's emerging scholarly work is motivated by the potential to improve public health through road safety interventions. Specifically, his unfolding research explores young drivers' knowledge, perceptions and attitudes towards the use and legalization of cannabis, in relation to driving habits and impaired driving

Chris Poirier

Chris Poirier, P.L.(Eng.) is a Transportation Engineer and Senior Project Manager with Associated Engineering's Transportation Group in Lethbridge, Alberta. He has worked on projects in Ontario, B.C. and Alberta. Chris studied Civil Engineering Technology Design and Management at Lethbridge College in 2001 and received a BA from the University of Calgary in Urban Studies with a Minor in Transportation Studies in 2008.

Chris's experience is primarily in roadway design. He has been involved peripherally in numerous road safety audits and design reviews and has been directly involved in several recent road safety related projects. Chris received his RSP1 designation in July of this year. He has been active in the executive of the local chapter of the Institute of Transportation Engineers and has presented at TAC and CITE conferences on projects involving the retrofitting of active mode facilities.

Chris is fascinated with the fields of human factors and road safety looks forward to getting to know and serve the road safety community.

Send Us Your Article

Want to be a published author? Have a synopsis of your current work or recently completed project that could be included in the next issue of The Safety Network Newsletter? Articles on any aspect of road and motor vehicle safety are being requested for submission to the Editorial Board. Articles can be 300 to 1000 words plus accompanying photos and graphics.

Please send submissions to Chris Poirer, Chief Editor, poirierc@ae.ca.

Envoyez-nous votre article

Voulez-vous être un auteur publié? Faites figurer dans le prochain numéro de The Safety Network Newsletter un synopsis de votre travail actuel ou de votre projet récemment terminé. Des articles sur tous les aspects de la sécurité des routes et des véhicules à moteur sont demandés pour être soumis au comité de rédaction. Des articles doit être d'une lonueur de 300 à 1000 mots, plus les images et les graphiques qui l'accompangnent.

Veuillez envoyer vos soumissions à Chris Poirer, rédactrice en chef, poirierc@ae.ca.

Acknowledgements

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

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