No Accident: Eliminating Injury and Death on Canadian Roads

Presented at:
Edmonton's 7th International Conference on Urban Traffic Safety
April 29, 2015

Photo: From the Collections of The Henry Ford
The Result in Canada Alone

• Since 1950, over 235,000 people killed in motor vehicle crashes

• In a recent 10-year period, over 187,000 people hospitalized due to serious injuries from traffic crashes
How Canada Compares

- Canada’s road crash fatality rate is double that of the world’s best performers

- We are no longer making any progress for pedestrians and cyclists

Comparing Two Causes of Fatalities in Canada

![Bar chart comparing Assaults/Terrorism/War and Road Crash Victims fatalities in Canada.](chart.png)
The current situation

- A system failure
- A major public health problem

“In every situation a person might fail, the road system should not.”
Safe System Thinking

The right speed

Vehicles
Roads
Drivers

I Know Your Type

New & Young
Medically Unfit
High Risk
Motorcyclist
Commercial
Everyone Else
Speed cameras can be fun

• Automated speed enforcement is widely deployed in world’s best performing road safety countries (TRB, 2010).

• Study after study reveals their effectiveness (Pilkington & Kinra, 2005; Elvik, 2004; Pérez et al., 2007).

Saving lives with pictures
Unsafe Driving Depicted in Auto Advertising

If you see an automobile advertisement that depicts unsafe speed, racing, or unsafe driving, let your views be known to Advertising Standards Canada.

See: *Interpretation Guideline #4—Alleged Infractions of Clauses #10 or #14: Motor Vehicle Advertising.*

## Countless Human Factor Problems

<table>
<thead>
<tr>
<th>Inexperience</th>
<th>Muscle strength and flexibility limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underdeveloped orbitofrontal cortex</td>
<td>Decision errors</td>
</tr>
<tr>
<td>Presence of peer passengers</td>
<td>Confusion</td>
</tr>
<tr>
<td>Carelessness</td>
<td>Turning and pulling-out errors</td>
</tr>
<tr>
<td>High predisposition for risk</td>
<td>Left-turn corner cutting</td>
</tr>
<tr>
<td>Disregard for others</td>
<td>Poor judgement</td>
</tr>
<tr>
<td>Pressure to maintain schedules</td>
<td>Overconfidence</td>
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<tr>
<td>Cardiovascular conditions</td>
<td>Failure to scan the road ahead</td>
</tr>
<tr>
<td>Pulmonary conditions</td>
<td>Feeling rushed</td>
</tr>
<tr>
<td>Diabetes</td>
<td>States of agitation</td>
</tr>
<tr>
<td>Hypertension</td>
<td>Following too closely</td>
</tr>
<tr>
<td>Psychiatric conditions</td>
<td>Sense of entitlement to the roadway</td>
</tr>
<tr>
<td>Seizures</td>
<td>Alcohol</td>
</tr>
<tr>
<td>Visual acuity issues</td>
<td>Drugs</td>
</tr>
<tr>
<td>Compromised visual fields</td>
<td>Distraction</td>
</tr>
<tr>
<td>Visual blind spots</td>
<td>Fatigue</td>
</tr>
<tr>
<td>Contrast sensitivity issues</td>
<td>Not using seat belt</td>
</tr>
<tr>
<td>Dementias</td>
<td>Not wearing helmet</td>
</tr>
<tr>
<td>Musculoskeletal conditions</td>
<td>Not ensuring vehicle is mechanically safe</td>
</tr>
<tr>
<td>Weak Motor skills</td>
<td>Speeding</td>
</tr>
</tbody>
</table>

Photo: Official Bicycle Safety Manual, Police Safety Council, circa 1940s

Photo: www.pedbikeimages.org / Ryan Snyder
Obedience may save a life
Prepared by the
AMERICAN AUTOMOBILE ASSOCIATION

However, without warning he suddenly decides to make a left hand turn at the corner.

Result—George is hit head-on—another unnecessary death due to carelessness on George’s part.
The Ethical City

• Reducing motor vehicle speeds and having livable streets
• Reining in the automobile
• Improving the protection of pedestrians and cyclists
• Improving public transport and the public bicycle
“The rich drive, the poor walk. The rich roll along the axis of the grand avenue: the poor are off-centre, in the gutter: and eventually a special strip is provided for the ordinary pedestrian, the sidewalk.”

Lewis Mumford, *The Culture of Cities*, 1938
New order of the Big Three

- Pedestrians
- &
- Cyclists
- Public Transport
- Private Cars
Doing things on the cheap

“Simple, well known safety measures can pay back the costs of investment in 10 weeks.”

*(UK Road Safety Foundation)*

### Safe Speeds

<table>
<thead>
<tr>
<th>Impact Potential</th>
<th>Safe Maximum Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potential for impact with a pedestrian or cyclist</td>
<td>&lt; 30 km/h</td>
</tr>
<tr>
<td>Potential for side-impact collision with another vehicle</td>
<td>50 km/h</td>
</tr>
<tr>
<td>Potential for frontal impacts with another vehicle</td>
<td>70 km/h</td>
</tr>
<tr>
<td>No potential for any of the above collision types</td>
<td>100 – 110 km/h</td>
</tr>
</tbody>
</table>

Adapted from C. Tingwall & N. Haworth (1999), *Vision zero—An ethical approach to safety and mobility.*
Speed and crash risk

- A review of the research involving 98 high-quality studies containing 460 estimates of the effect on crashes from speed, concluded there is a strong statistical relationship between speed and road safety. When the average mean speed of traffic is reduced, the number of accidents and the severity of injuries will almost always go down (Elvik et al., 2004).
Vehicle safety history

Air bag crisis confronts auto industry

The Lane Press, Wednesday, August 3, 1977

ACIDENT SURVIVAL - AIRPLANE AND PASSENGER CAR

by

HUGH DE HAVEN

Research Associate in Health
Department of Public Health
Cornell University
Medical College

(responsible for statements or opinions expressed are
for presentation at the SAE symposium on pedestrian the passenger)

...
Six air bags

Photo: Volvo Car Corporation
The UK Locomotive Act of 1865

The law required a person, often a flagman, to walk 60 yards ahead of the vehicle and wave a red flag, or a lantern in the night, to warn others of the motorized hazard to come.
Volvo 2020 Goal

The Safe System

Safe system design will be needed for a long time
## Why Does it Work?

### Old style thinking vs. Safe system thinking

<table>
<thead>
<tr>
<th>Old style thinking</th>
<th>Safe system thinking</th>
</tr>
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<tbody>
<tr>
<td>The responsibility to prevent crashes, injuries and deaths rests with individuals</td>
<td>The responsibility to prevent crashes, injuries and deaths rests with system designers</td>
</tr>
<tr>
<td>Focuses on what causes accidents</td>
<td>Focuses on what causes safety</td>
</tr>
<tr>
<td>Allows individual errors to kill and harm</td>
<td>It is unethical to allow this</td>
</tr>
<tr>
<td>80 percent of the problem is people and driver error</td>
<td>Most of the solutions involve roads and vehicles</td>
</tr>
<tr>
<td>Studies the effects of single road safety interventions one at a time</td>
<td>Understands safe systems theory and that road safety interventions work best together or in “bundles”</td>
</tr>
<tr>
<td>Can only justify making improvements based on a “cost-benefit” analysis</td>
<td>Understands the default is to make the motor vehicle and the road system safe</td>
</tr>
<tr>
<td>Only works on problems that appear big, i.e., problems with large numbers</td>
<td>Addresses all road safety problems even where numbers may appear small</td>
</tr>
<tr>
<td>Waits for crashes and coroner reports to identify problems</td>
<td>Proactively takes action using past data, crash testing, simulations, physics, etc.</td>
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*Source: Arason, No Accident: Eliminating Injury and Death on Canadian Roads*