TRAFFIC INJURY RESEARCH FOUNDATION

A Question of Size: Involvement of Large Trucks in Road Crashes

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3rd Ontario Road Safety Forum
Toronto, Ontario
March 6, 2018

Involvement of large trucks in road crashes

- Background on TIRF.
- Experiences of drivers of large trucks.
- Prevalence of large truck crash problem.
- Driver characteristics.
- Collision characteristics.
- Key contributing crash factors.
- Next steps.

Background on TIRF

- **TIRF Fatality Database contains data for fatally injured crash victims.**
- **It is the only Canadian database that matches police-reported crash data with coroner/medical examiner data.**
- **Multiple sponsors:**
  - Data collection sponsored by State Farm;
  - Production of fact sheets sponsored by Public Health Agency of Canada (PHAC) and State Farm; and,
  - Production of Alcohol and Drug-Crash Problem report sponsored by Canadian Council of Motor Transport Administrators (CCMTA).

Background on TIRF

- **TIRF, Drop It And Drive (DIAD) and The Co-operators formed the Canadian Coalition on Distracted Driving (CCDD).**
- **CCDD includes 24 agencies from diverse range of fields, including:**
  - various levels of government;
  - law enforcement;
  - academia;
  - health;
  - industry (trucking, communications, insurance, automobile); and,
  - not-for-profit sector.

Background on TIRF

> **TIRF has worked with municipalities on various road safety issues.**

Accident Analysis and Prevention 62 (2014) 238–247

Contents lists available at ScienceDirect

Accident Analysis and Prevention

journal homepage: www.elsevier.com/locate/aap

An evaluation of Winnipeg's photo enforcement safety program: Results of time series analyses and an intersection camera experiment

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Background on TIRF

- **More recently, TIRF produced a fact sheet for the Toronto Police Service.**

Experiences of drivers of large trucks

- **Drivers of large trucks spend more time in their vehicles and on the road than other drivers.**
- **They drive for extended periods during:**
  - day and night;
  - weekdays, weekends, and holidays;
  - all seasons and weather; and,
  - in all traffic conditions.
- **Large trucks are driven twice as far per year than passenger vehicles.**

Experiences of drivers of large trucks

- **Large trucks have greater weight, mass and length than passenger vehicles, drivers of these vehicles:**
  - must contend with larger blind spots;
  - need more space to turn (e.g., on city streets);
  - are less able to see vehicles and pedestrians who are lower to the ground in heavy traffic; and,
  - require more space to stop due to the vehicle's weight.
- **In addition, these drivers require a greater safe following distance.**

Experiences of drivers of large trucks

- **All Canadian jurisdictions have licensing requirements for drivers of large trucks that are more rigorous than those for drivers of other vehicles.**
- **Canadian Trucking Alliance (CTA) and Transport Canada are working on a universal mandate which would require all large trucks to have electronic logging devices (ELDs) instead of paper log books.**

Prevalence of large truck crash problem

- **Public perceptions of the problem.**
- **Large trucks in fatal crashes:**
  - Types of vehicles involved; and,
  - Types of occupants involved.
- **Exposure of large trucks in fatal crashes.**

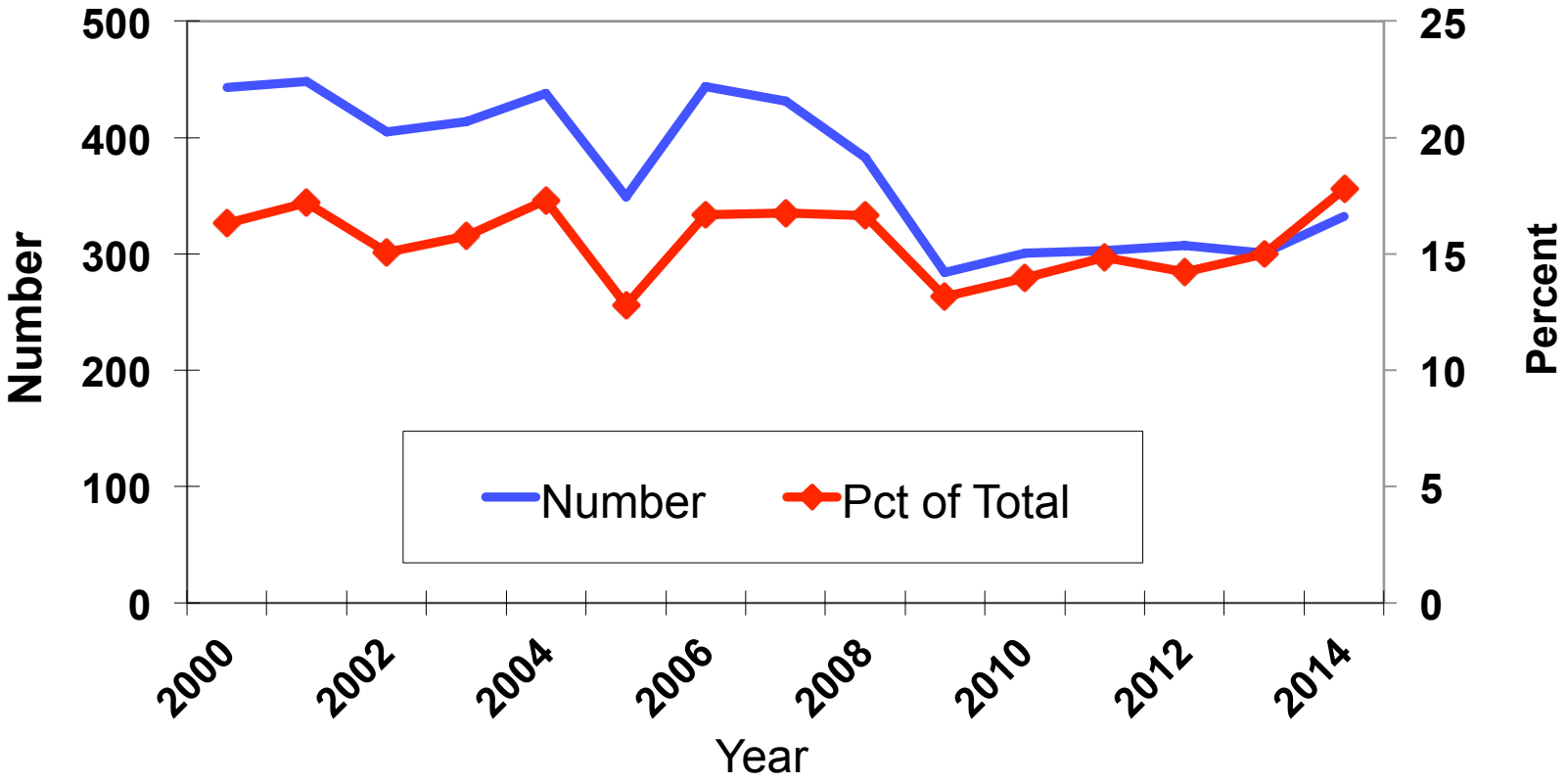
Public perceptions

- **TIRF Road Safety Monitor surveys Canadian drivers on road safety issues.**
- **Most respondents were concerned that:**
  - drivers of large trucks were tired after driving long hours (70%);
  - large trucks did not meet safety standards (87%);
  - large trucks were travelling too fast or above the speed limit (64%).
- **When asked about driver training programs for passenger vehicles:**
  - 64% did not feel that there adequate training on how to share the road with large trucks (64%).

Large trucks in fatal crashes

- **In 2014 in Canada, 4% of all registered vehicles were large trucks.**
- **Yet, 18% of all fatalities involved at least one large truck in Canada (excluding BC).**
- **From 2000-2014, an average of 372 fatalities/year resulted from crashes involving large trucks (16% of total).**
- **Over-involvement is not the same as "at-fault."**

Fatalities resulting from crashes involving large trucks: Canada*, 2000-2014



*** excluding BC**

Types of vehicles and occupants involved

- **Large trucks are over-represented in fatal crashes.**
- **Occupants of other vehicles are more likely to die in these crashes since:**
  - large trucks weigh significantly more than passenger vehicles; and,
  - Large trucks are designed with greater ground clearance.

Types of vehicles and occupants involved

- **In Canada (2000-2014), only 15% of persons killed in large truck crashes were occupants of the large trucks.**
- **Among those fatalities who were not large truck occupants:**
  - 70% were car/truck/van/bus occupants;
  - 9% were pedestrians;
  - 3% were motorcyclists;
  - 2% were cyclists; and,
  - 1% were off-road vehicle occupants (snowmobiles, ATVs, dirtbikes).

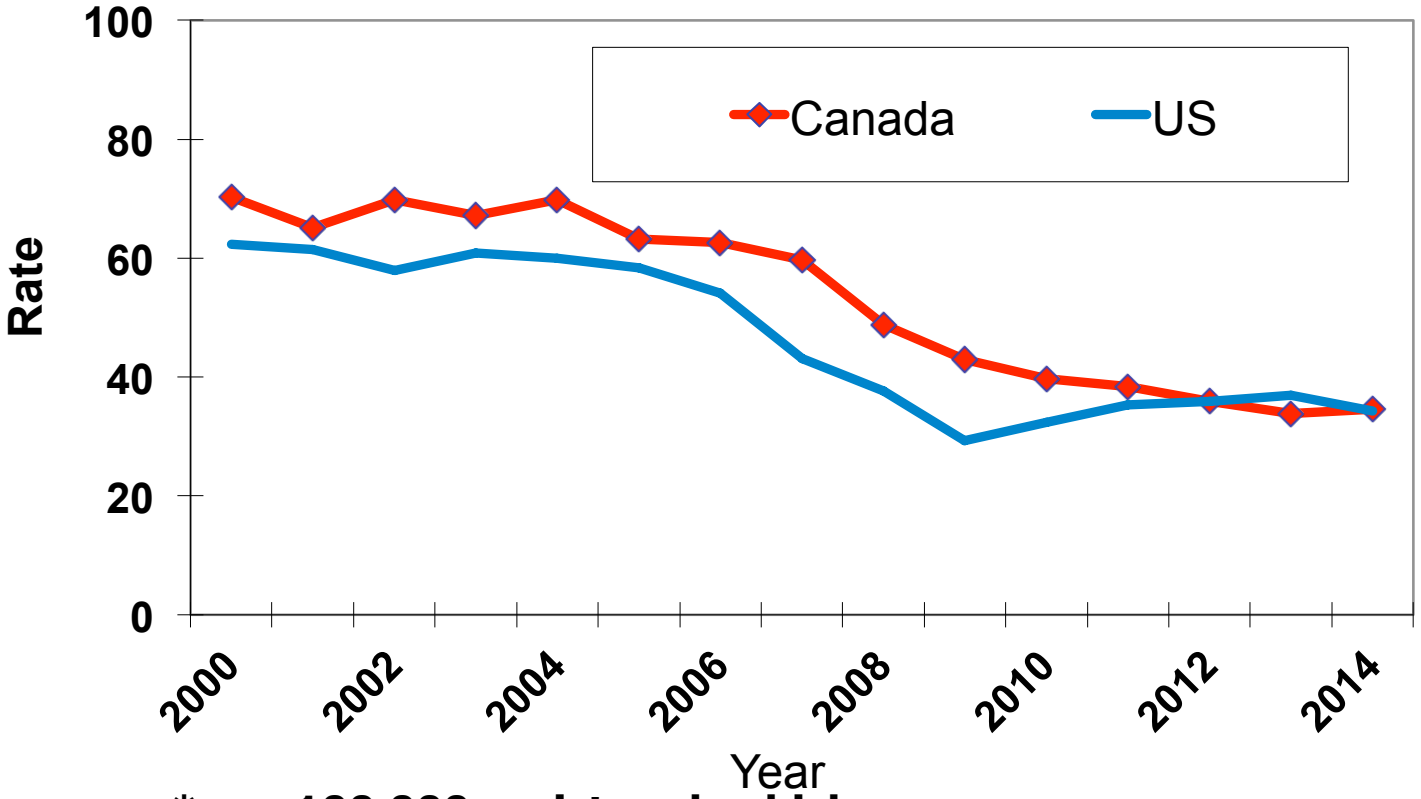
Types of vehicles and occupants involved

- **To compare, among those killed in large truck crashes in the US in 2014:**
  - 17% were occupants of large trucks;
  - 73% were occupants of other vehicles; and,
  - 10% were non-occupants (pedestrians, cyclists).
- **Among those injured in large truck crashes in the US in 2014:**
  - 23% were occupants of large trucks;
  - 74% were occupants of other vehicles; and,
  - 3% were non-occupants (pedestrians, cyclists).

Exposure of large trucks in fatal crashes

- **Involvement of large trucks in fatal crashes measured per 100,000 registered vehicles.**
- **Decreases in large truck fatal crash involvement per vehicle registration from 2000 to 2014:**
  - Canada (70.2 to 34.6);
  - US (62.3 to 34.3).

Involvement of large trucks in fatal crashes by vehicle registration*: Canada and US, 2000-2014

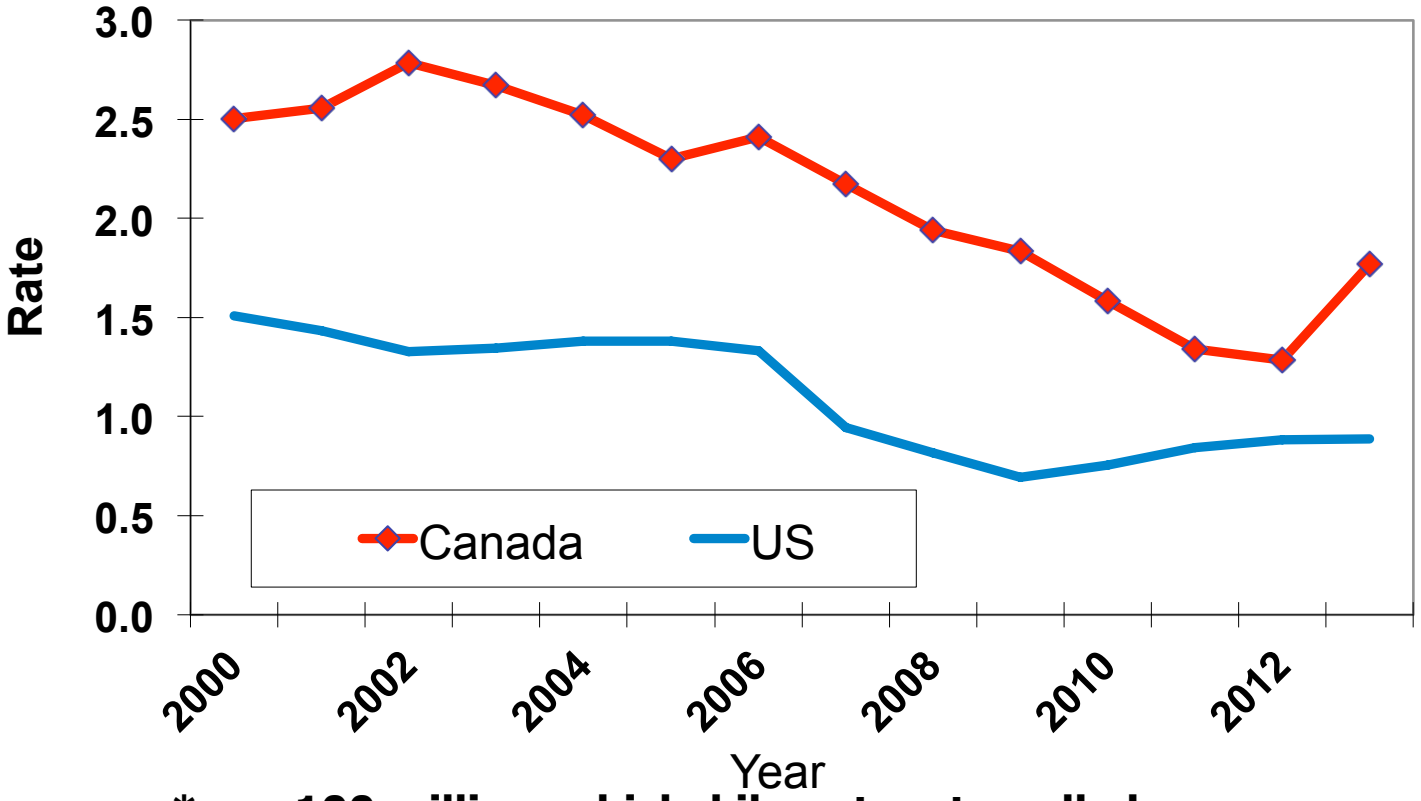


*** per 100,000 registered vehicles**

Exposure of large trucks in fatal crashes

- **Involvement of large trucks in fatal crashes measured per 100 million vehicle kilometres travelled (VKT).**
- **Decreases in large truck fatal crash involvement per VKT from 2000 to 2013:**
  - Canada (2.5 to 1.8);
  - US (1.5 to 0.9).

Involvement of large trucks in fatal crashes by distance travelled*: Canada and US, 2000-2013



*** per 100 million vehicle kilometres travelled**

Driver characteristics

- **Driver age:**
  - Young drivers have a higher crash risk;
  - Fatal crash risk for younger large truck drivers is similar to that for young passenger vehicle drivers;
  - Trucking industry has a shortage of new drivers.
  - Older drivers pose no greater risk than younger or middle-aged drivers (Bergoffen et al. 2010).
- **Driver sex:**
  - In the US, males had higher crash rates than females (Knipling et al. 2004).
  - In Canada (2000-2014), males were 98% of fatally injured large truck drivers and 77% of passenger vehicle drivers.

Driver characteristics

- **Among fatally injured drivers in Canada (2000-2014), 44% of drivers of large trucks were wearing seatbelts compared to 63% of drivers of passenger vehicles.**
- **By comparison, in 2014 in the US, 61% of fatally injured drivers of large trucks were wearing seatbelts (FMCSA).**
- **In Canada, 12% of drivers of large trucks died either by incineration or drowning, possibly complicating determination of seatbelt use.**

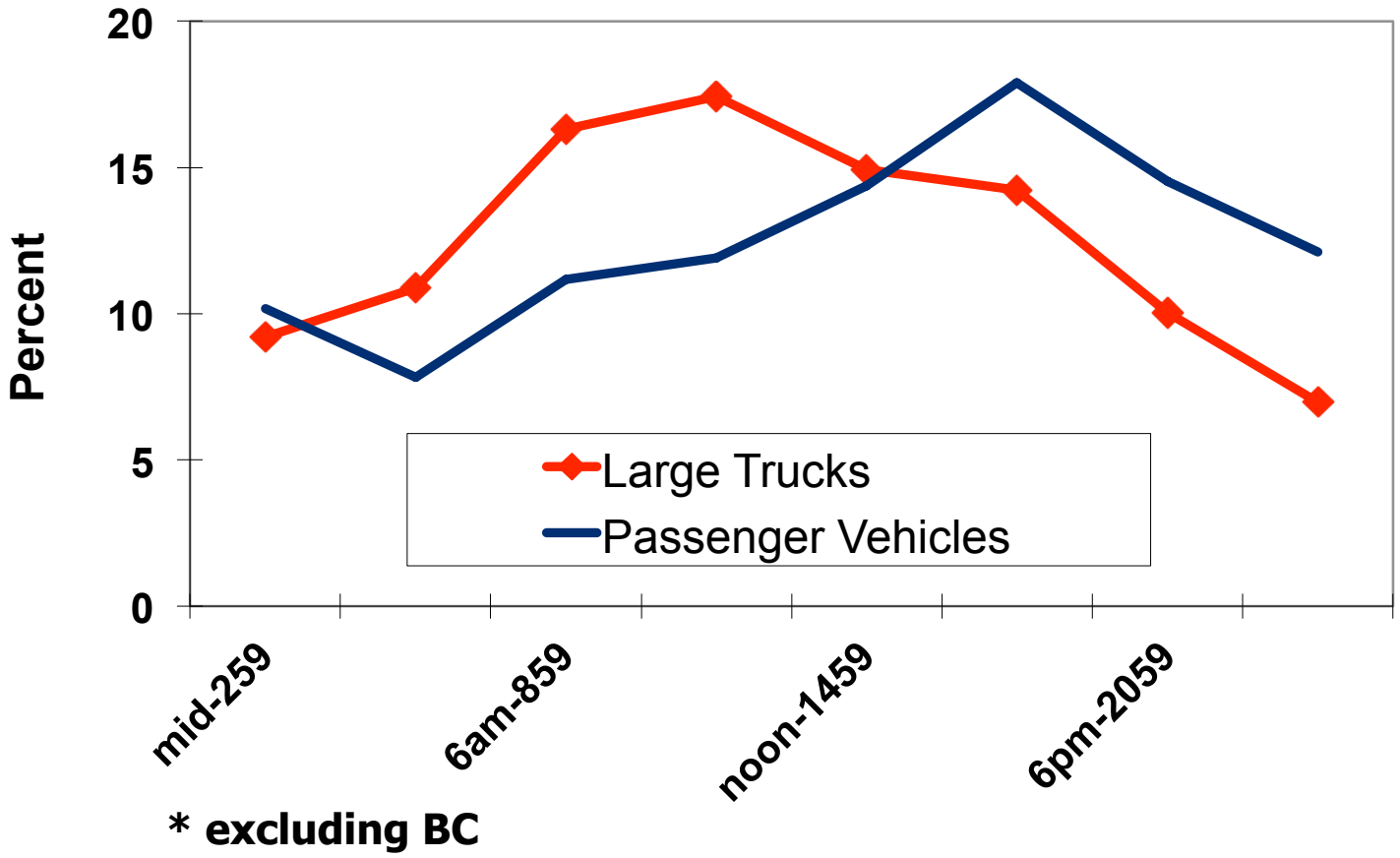
Collision characteristics

- Most fatal and injury collisions involving large trucks are multi-vehicle collisions (Jonah et al. 2009).
- Similarly, 80% of US fatal large truck collisions were multi-vehicle (NCSA 2015) compared to 58% of fatal collisions involving passenger vehicles.
- 61% of fatal crashes in the US involving large trucks occurred in rural areas (FMCSA 2016).

Collision characteristics

- **Analysis of fatal crashes in Canada from 2000-2014 showed:**
  - Between 3 am and noon, a larger percentage of drivers of large trucks die in road crashes than drivers of passenger vehicles;
  - 17% of fatally injured drivers of large trucks died in crashes which occurred between 9 am and noon; and,
  - 18% of fatally injured passenger vehicle drivers died in crashes which occurred between 3 pm and 6 pm.

Percentage of driver fatalities by time of day: Canada*, 2000-2014



* excluding BC

Key contributing crash factors

- **Driver speed:**
  - Speed was a factor in 20% of fatal large truck crashes in US in 2014 (FMCSA 2016).
  - In Canada (2000-2014), 20% of fatally injured drivers of large trucks were in a speed-related crash compared to 27% of passenger vehicle drivers.

Key contributing crash factors

- **Driver fatigue:**
  - 15% of casualty crashes resulted from driver fatigue (McCartt et al. 2008);
  - May be under-reported if there were no witnesses and if drivers do not admit they were fatigued;
  - Yet, drivers identify fatigue as a serious problem while driving a large truck (Vanlaar et al. 2009).
  - In Canada (2000-2014), 10% of fatally injured drivers of large trucks were in a fatigue-related crash compared to 7% of passenger vehicle drivers.

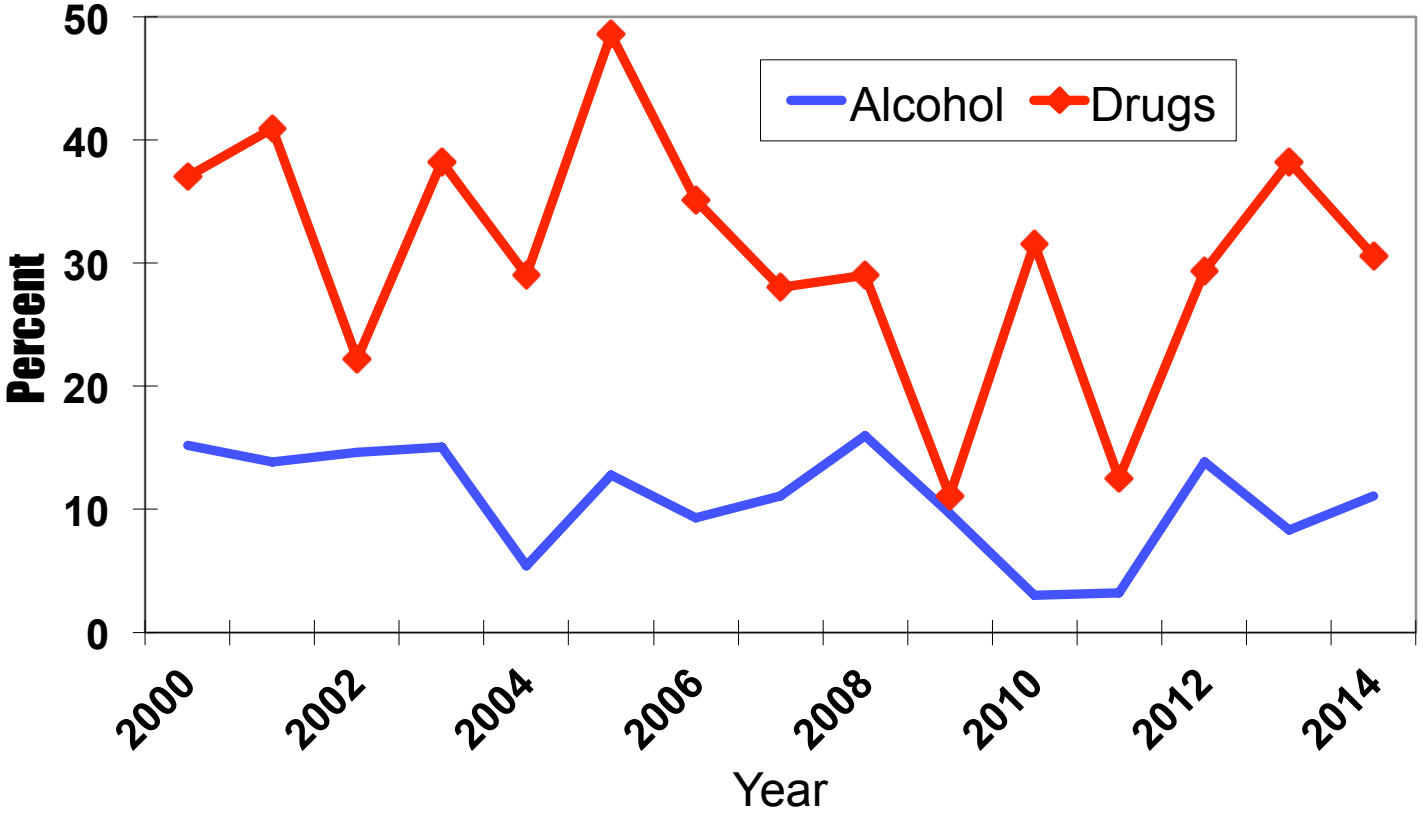
Key contributing crash factors

- **Driver distraction is being addressed by means of introducing:**
  - driver training;
  - educational and awareness programs;
  - cell phone policies; and,
  - crash avoidance technologies (Thiffault 2011).
- **Driver distraction:**
  - Naturalistic study revealed that in 71% of crashes, 46% of near-crashes, 60% of all safety-critical events, drivers were engaging in non-driving tasks (Bishop et al. 2011).

Key contributing crash factors

- **Alcohol and drug use among fatally injured drivers in Canada (2000-2014):**
  - 11% of drivers of large trucks had been drinking, compared to 36% of drivers of passenger vehicles;
  - The percentage of these drivers who had been drinking ranged from 3% in 2010 to 16% in 2008.
  - Only 64% were tested for drugs, compared to 88% who were tested for alcohol.
  - 31% of tested drivers were positive for drugs.
  - Cannabis and CNS depressants were found in 12% of tested drivers, compared to narcotic analgesics (8%) and CNS stimulants (6%).

Alcohol and drug use among fatally injured drivers of large trucks: Canada, 2000-2014



* excluding BC

Next steps

- Improve and standardize driver training.
- Installation of electronic on-board recorders and electronic logging devices (ELDs).
- Safety features such as electronic stability control, backup cameras and devices that block phone use.
- Maintain connectivity with managers while minimizing driver distraction.
- Continue research on how to best address fatigue among drivers.

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