



# Cost of Crashes

## Risks, Costs, and Predictors of Crash Involvement

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## Background

Movement of materials by road throughout Canada is characterized by over 65 million shipments annually. This amounts to almost 700 billion kg of materials being hauled over 41 billion km by a fleet of only 914,000 trucks of which about 400,000 are heavy commercial vehicles. (Government of Canada, 2015)

With 3.3 million vehicles travelling British Columbia roads, the portion of the Canadian fleet serving British Columbia numbers 161,000 trucks or almost 5% of the registered vehicles in BC. When limited to heavy commercial vehicles registered in BC, the percentage drops to just over 1% or about 42,000. (Insurance Corporation of British Columbia, 2014)

## Likelihood of Crash Involvement

It is easy to see the potential for crash involvement in the commercial fleet given the distance travelled and the unbalanced mix of professional vs. private operators on the roadway. When crash numbers for British Columbia are examined, and compared to the number of commercial vehicles on the road, we see that they are involved in approximately 8.5% of all crashes and when only heavy commercial vehicles are considered (over 11,794 kg), the percentage is just over 4%. Although a small number over all, that still translates to an average crash risk in the heavy commercial fleet of approximately 19% or one in five. In other words, one out of every five vehicles in your fleet will be involved in a crash resulting in property damage, injuries, or fatalities each year.

Generalized statistics such as these do not account for individual fleet variances involving training, procedure, or other mitigating factors.

## Uninsured and Total Costs

Assigning costs per crash becomes a complex exercise that encompasses elements of property damage and potential loss of use of equipment and business through

perceived unreliability, personal injury which will range from mild short-term restrictions to lifelong disability, and fatality which can include heavy regulatory penalties. The best evaluation of costs available comes from the US Federal Motor Carrier Safety Administration and values displayed below have been adjusted to reflect 2015 Canadian dollars. (Eduard Zaloshnja, March 2007)

**Table 1 Unit costs of medium and heavy truck crashes. (FMCSA – 2007)**

Incident Involving	Incident Cost	Incident Involving	Incident Cost
Heavy Truck	\$110,957	Property Damage Only	\$22,180
Multiple Trailers (B train, LCV)	\$424,905	Non—Fatal Injury Incident	\$286,535
Straight Trucks	\$82,613	Fatal Injury Incident	\$5,289,522

Although the risk of loss is controlled using insurance, other elements which must be considered are those losses which are not insured or are small enough that they remain unreported, and therefore costs are borne directly by the Company. As these are seldom reported or claimed, it is difficult to obtain an accurate accounting of their impact on company operations. In any event, losses absorbed by purchasing insurance will result in future increased premiums and in extreme cases, an inability to purchase insurance at all.

What is known, but often overlooked, is the value of activity required to replace losses associated with crashes of any severity. The following table provides recovery values for a range of profit margins given a \$10,000 loss due to accident.

**Table 2 Revenue required to offset uninsured costs of accidental loss**

Uninsured Cost of Accident	Company Profit Margin %	Sales/Revenue to Recover Cost	Ratio of Loss to Recovery
\$10,000	2.00%	\$500,000	1:50
	2.50%	\$400,000	1:40
	3.00%	\$333,333	1:33
	3.50%	\$285,714	1:29
	4.00%	\$250,000	1:25
	4.50%	\$222,222	1:22
	5.00%	\$200,000	1:20
	5.50%	\$181,818	1:18
	6.00%	\$166,667	1:16

This table illustrates for various profit margins the volume of sales needed to cover the uninsured cost of a repair or loss. For example, a loss of \$10,000 at a margin of 2.5%, needs sales of \$400,000 to be generated to cover the loss. The equivalent of \$40 for each \$1 spent.

Another way of describing this cost is to look at how many working days it will require to recover your losses. If we assume daily earnings of \$700 we will need 571 days worked, or over 2 working years to recover the costs. As most small business does not have limitless resources this scenario will be complicated by borrowing to cover the initial costs and the resulting interest repayments.

More difficult to evaluate are other costs surrounding loss of reputation and consumer confidence as a consequence of being involved in a public incident. Potentially the loss can be more than just financial or contractual and could even result in personal criminal charges against the owners, managers, or supervisory staff.

## Leading Indicators

Too often following an accident the comment is made, “I knew it would happen”, or “I could see it coming”. Such comments are based on casual observation of workplace behaviours and the unfortunate perception of an accident being a random and unpredictable event.

Current research shows strong correlation between a number of driver behaviours, common traffic situations, environmental conditions, and the incidence of crashes. One of the most obvious elements is the environmental conditions such as fog, ice, or snow. An experienced observer will quickly point out that winter conditions create road hazards that often result in a crash.

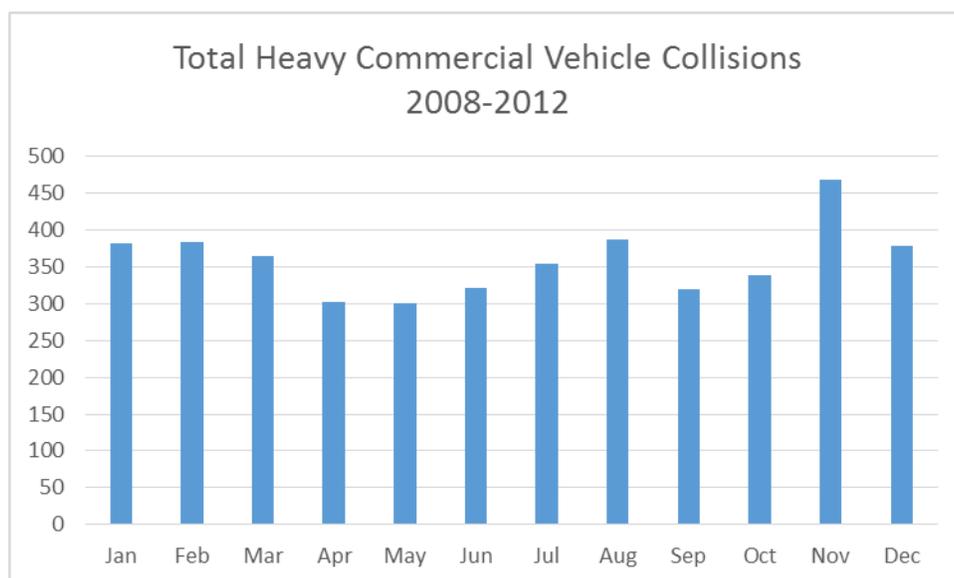


Figure 1 5-year total collisions by month for heavy commercial vehicles - 2008-2012 - ICBC

However, the above chart also shows a rise in crash rates during summer months suggesting that other factors may be at work.

The American Transportation Research Institute updated its report on predicting truck crash involvement in 2011. The study points to aggressive or careless driving habits that correlate to an increased likelihood of being involved in a crash and an excerpt of the summary table is produced on the following page.

**Table 3 Excerpted from ATRI - Predicting Truck Crash Involvement: A 2011 Update - Summary of Crash Likelihood**

If a driver had:	The crash likelihood increased:
A Failure to Use/Improper Signal conviction	96%
A Past Crash	88%
An Improper Passing violation	88%
An Improper Turn conviction	84%
An Improper or Erratic Lane Changes conviction	80%
An Improper Lane/Location conviction	68%
A Failure to Obey Traffic Sign conviction	68%
A Speeding More Than 15 Miles over Speed Limit conviction	67%
Any conviction	65%
A Reckless/Careless/Inattentive/Negligent Driving conviction	64%
A Driving Too Fast for Conditions conviction	56%
A Failure to Obey Traffic Signal/Light conviction	56%
An Hours-of-Service violation	45%
A False or No Log Book violation	42%
An Improper Lane Change violation	41%
A Following Too Close violation	41%
A Speeding 1 to 15 Miles over Speed Limit conviction	40%
A Speeding violation	38%
A Following too closely conviction	36%
Any Moving violation	29%
Any OOS violation	26%
A Failure to Obey Traffic Control Device violation	21%
A Size and Weight violation	18%

Other studies have pointed to a driver's past safety performance as a predictor of future safety performance. In addition, factors surrounding driver health and wellness are also predictive of potential lowering of safety performance (D. E. Cantor et al, 2010).

Other factors contributing to overall safety performance include driver age where there is an improvement in safety performance around age 25, and gender, with female drivers being less likely to be involved in a crash. It was also noted that drivers who work for multiple carriers have an increased crash risk (David E. Cantor, September 2010). However, owner-operators tend to have a lower crash risk than company drivers. (D.E. Cantor, 2013)

## Conclusion

The uninsured cost of even a small crash has company impacts that are quite extreme making the management of crash hazards very important. The appropriate action when faced with any hazard is to evaluate its nature, the risks it poses, and apply corrective actions.

When looking at reducing the risk of crash in a fleet it is easy to point at the driver and not look any further. However, risk management is best dealt with by generating and following clear policies that define the hiring practices, training, and expected level of driver professionalism. Additionally internal review of company workflow to ensure adequate time for tasks is provided so that appropriate defensive driving behaviours are encouraged.

Additional areas providing opportunity for management of crash risks would involve maintenance of a stable workforce and promotion of driver wellness programs within the company.

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