

# A well-designed driver safety program will pay dividends!

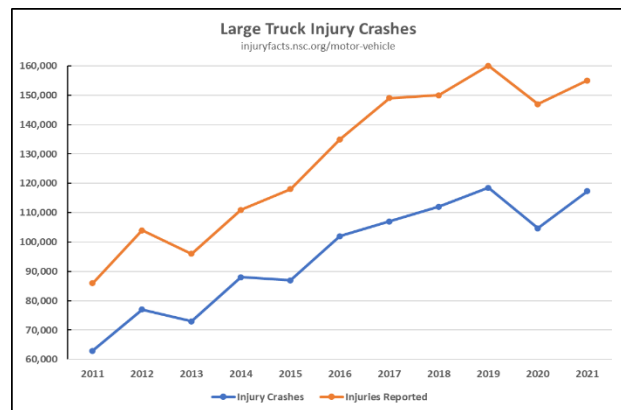
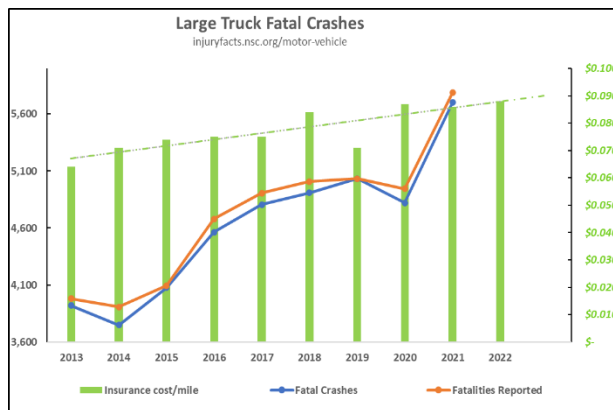
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..... can it be quantified a priori? By how much?

It is well known that the number of fatal crashes in the United States involving large trucks has been increasing annually reaching over 5,000 fatalities in 2021. Certain high-profile crashes have brought increased media attention to safety problems that plague the trucking industry. Pressure is being brought to bear to improve safety for industry and the traveling public.

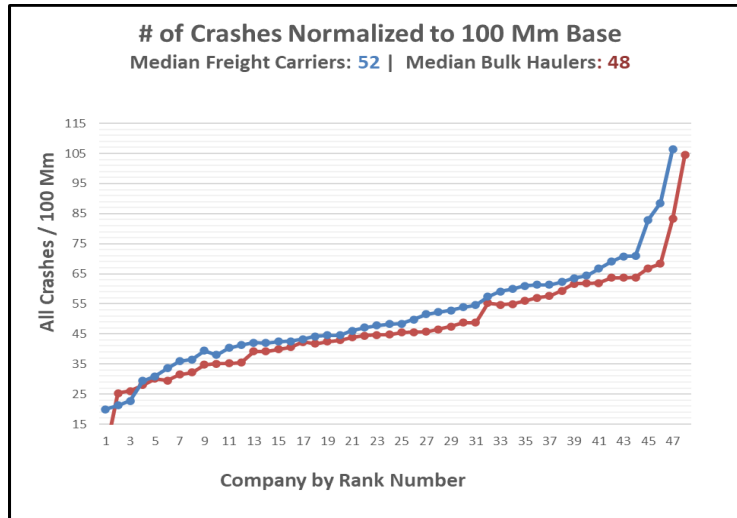


## All Companies can Reduce Crashes

A comparison of the safety record of commercial carriers can be created from crash reports provided by carriers to USDOT which are then reported using the SAFER System. (U.S. DoT/FMCSA/SAFER System) The chart below shows the results for a sample of 52 freight carriers and 48 bulk haulers. The number of crashes for each company were totaled (fatal plus injury

plus tow away) and then normalized against the total number of miles reported by the same company. This provided a total crash number per hundred million miles for each company. The companies were then ranked by total crashes per 100Mm scores which results in the following graph.

It is notable that the total crash rate per 100Mm for the least safe companies exceed 70 crashes per hundred million miles driven. The median for all 100 companies is 53 crashes per hundred million miles. In comparison, the median performance is 52 crashes per 100 hundred million miles for freight carriers and 48 for bulk haulers.



The top companies had a crash rate of 25 and less while the 'worst' companies are 75 and above per hundred million miles driven. If all 100 companies in the sample employed safety technologies coupled with management oversight, training, and appropriate driver incentives to achieve the same performance as the top ten companies, the number of crashes would be reduced by 56% saving an annual total of \$1.3 billion for these companies collectively.



### Usage Based Insurance (UBI): one good approach

For some time now, the insurance industry has recognized the value of 'observation' as seen in the development and growth of usage based insurance (UBI). UBI is a type of auto insurance

that tracks mileage and driving behaviors to determine the premium rates. Usage-based insurance is different from traditional auto insurance, which relies on actuarial studies of aggregated historical data to produce rating factors that include driving record, credit-based insurance score, personal characteristics (age, gender, and marital status), vehicle type, garage location, vehicle use, previous claims, liability limits, and deductibles. UBI uses in-vehicle telecommunication devices (telematics) or mobile applications to monitor (observe) the driver's behavior, including miles driven, time of day, location, rapid acceleration, hard braking, hard cornering, and airbag deployment. The data collected is used to assess the risk of insuring the driver and to charge premiums accordingly. UBI is becoming increasingly popular among commercial trucking companies as it allows them to monitor their drivers' behavior and reward safe driving practices.

UBI for semi-trucks is a relatively new concept, but some insurance companies are already offering it. Usage Based Insurance is proof that drivers who volunteer to have their driving habits observed, drive better, and earn lower premiums because the frequency and severity of crashes are reduced. Top UBI programs include:

**Progressive Snapshot:** This program tracks your driving habits and offers discounts based on safe driving. You can save up to 30% on your premium.

**Nationwide SmartRide:** This program uses telematics technology to track your driving habits and offers discounts based on safe driving. You can save up to 40% on your premium.

**Geico DriveEasy:** This program tracks your driving habits and offers discounts based on safe driving. You can save up to 25% on your premium.

**Allstate DriveWise:** This program tracks your driving habits and offers discounts based on safe driving. You can save up to 25% on your premium.

**Root Insurance:** This company uses telematics technology to track your driving habits and offers personalized rates based on how you drive. You can save up to 52% on your premium.

**Plus others**

An example, Progressive's Smart Haul program for truckers allows small motor carriers and owner-operators to save between 5% and 20% on their truck insurance by allowing Progressive access to their Electronic Logging Device (ELD). The current average savings for owner-operators with Smart Haul is reported to be **\$1,179 per year<sup>1</sup>**.

Actual results shared by Progressive:

- a. Average monthly premium for truck insurance \$900, annual \$10,800
- b. Sign up discount for Smart Haul - \$500
- c. Data from 5 years of Smart Haul quantify savings up to 20% - average is 11%
- d. Savings per unit **\$1,179.00**

What does this mean?

The Federal Motor Carriers Safety Association (FMCSA) mandates different financial responsibility limits (insurance requirements) for commercial vehicles and motor carriers:

- For-hire interstate general freight carriers: \$750,000.
- For-hire and private carriers of oil and specific hazardous waste types: \$1 million.
- For-hire and private carriers of other hazardous substances: \$5 million.

These numbers are the minimum, mandatory insurance liability amounts and are typically higher than most state limits, which means drivers and carriers can expect to pay higher premiums.

An owner-operator with own authority power only, is a driver who owns a tractor and hauls loads using someone else's trailer. To operate under own authority, the driver needs to form a business and get an employer identification number (EIN). The driver is also fully in charge of all day-to-day operations.

On average, semi-truck insurance premium costs for leased owner-operators can range from \$3,000 to \$6,000 per year but can go higher depending on the actual vehicle, what's hauled, driving distance, and driving record. If it is an owner-operator who is working under their own authority, the price ranges from \$18,000 to \$30,000 for each truck owned. For new authorities, premium pricing is higher and ranges from \$24,000 to \$36,000 per year.

The average semi-truck insurance cost per month is between \$675 to \$2,000 (\$8,100 to \$24,000 per year) with the following breakdown:

<u>Coverages</u>	<u>Average monthly semi-truck insurance cost</u>
Primary trucking liability	\$500-\$1,500 a month
Non-trucking liability	\$25-\$50 a month
Physical damage coverage	Varies, depending on truck value, usually \$100-\$300 a month
Motor truck cargo insurance	Varies, depending on the cargo type, usually \$50-\$150 a month

The monthly semi-truck insurance cost also varies according to factors such as insurance type and carrier. Here are some average price ranges by insurance type<sup>2</sup>:

- Primary liability coverage: \$416 to \$1,000.
- General liability: \$42 to \$66.
- Umbrella policy: \$50 to \$58.
- Bobtail insurance: \$29 to \$50.
- Cargo insurance: \$33 to \$100.
- Physical damage: \$83 to \$250.
- Occupational or workers' compensation insurance: \$133 to \$183.

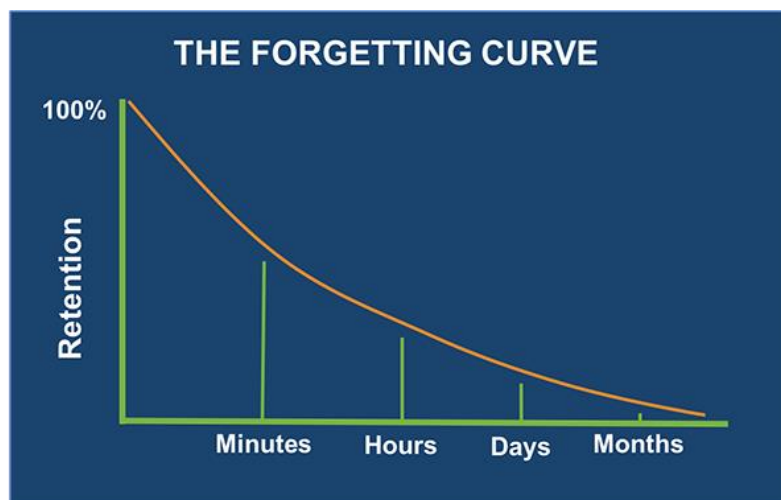
With the reported Smart Haul average savings of 11%, savings of \$810 to \$2,640 yearly might be expected in reduced premiums or the equivalent payouts for crash claims.

## Why does UBI Work?

UBI for semi-trucks has the potential to revolutionize the commercial trucking industry by incentivizing safe driving practices which turn into savings for a company. UBI is, however, a reactive assessment of a driver's behavior after it has occurred. It is predicated on the driver knowing he/she is being observed, the driver knowing which driving behaviors will result in greater incentives/lower premiums and the driver being able to access their account and track their progress if a 'score card' is offered by the program.

Why is observation and reinforcement of 'good' behaviors key to the success of UBI?

The **forgetting curve**<sup>3</sup> began with German psychologist, Hermann Ebbinghaus in the late 19th century. According to Ebbinghaus' findings and more recent studies, students forget 70% of what they are taught within 24 hours of the training experience and up to 90% of information is lost after one week. Ebbinghaus called this the forgetting curve, and he estimated that only 12 percent of learners apply the skills learned in training back to their jobs.



### The Hawthorne Effect

essentially says that we do better when other people are watching<sup>4</sup>. Additional studies have concluded that increased feedback (rather than an increased attention) resulted in greater worker productivity. That said, psychologists agree that the term "Hawthorne effect" is a generally fair explanation for why we might perform better in the presence of others. The Hawthorne effect now describes improved performance because of one's being observed.

Observation is the first step toward change. Change is impossible without observation. Scott Haas<sup>5</sup> Research also shows that people magnify what they do not only when they are observed, but even when they merely feel observed. In one study, even symbols of watching eyes to signal that their screen was recorded led people to think they worked harder. A camera recording people was similarly as effective as an actual human observer<sup>6</sup>.

## Extending the UBI Experience

For a motor carrier, an accident means lost time on the road. If your driver is injured and needs to take time off, and your equipment is sidelined, at a minimum you're facing a financial loss from lost revenue and out-of-pocket expenses, plus scheduling issues, and delivery disruptions. Moreover, the trucking business is opened to the potential of lawsuits from many directions.

The "forgetting curve" and the Hawthorne Effect clearly tell us that continual training/re-education/driver review are key to a company's safety program.

UBI is a reactive approach to assessing driver behavior after-the-fact by measuring/detecting (observing) events such as hard braking, hard acceleration, speeding etc. then reporting as required. What is missing is an active, predictive, driver in the loop warning system to alert drivers with recommended safe speeds which if followed will prevent rollovers and runaway trucks on upcoming hazardous road segments such as curves and slopes.

The **Road-Aware** safety application from RoadAware Safety Systems was developed for just such a requirement. One of the first results reported by RoadAware shattered a preconceived notion that drivers would fall across a spectrum of risk (low, medium, and high) generally based on experience. What was found was that nearly all drivers fell into the high risk category. Why? Because there was nothing in the cab to give them a recommended safe speed based their truck, load, road geometry and vehicle dynamics. They were all driving on the edge, "if I got around the curve without rolling over I guess I got around safely".

**Road-Aware** records a GPS/speed point every second and is the only technology that combines GPS information (position and speed) with vehicle dynamics (truck configuration and load) and accurate three-dimensional road geometry to calculate and provide advanced warnings and recommended safe speeds for the driver to safely navigate through difficult road segments.

**Road-Aware** is a form of machine intelligence that allows the application to provide audible and visual alerts to its operator just before they are required, to enable safe operation of the truck.

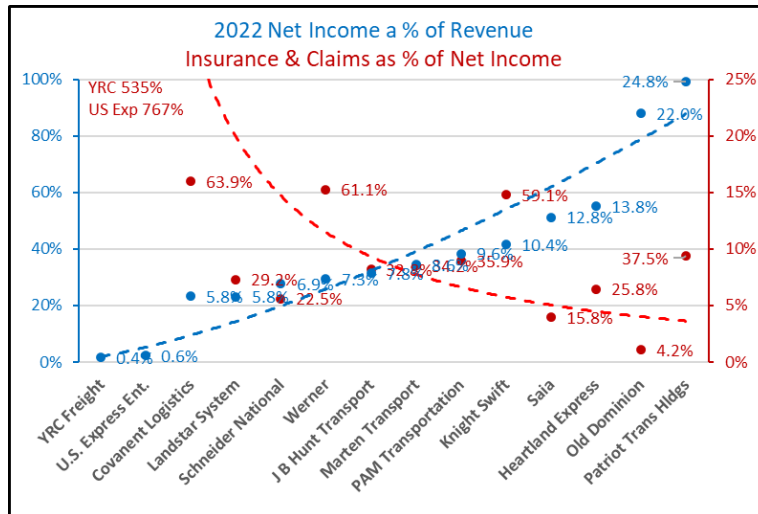
Use of **Road-Aware** goes beyond UBI in these important ways:

- a. It observes/measures driver performance in the most challenging segments of the journey.
- b. It is proactive – by providing alerts & recommended safe speeds that are specific to the geometry, vehicle, and load.
- c. It measures/compares/reports driver behavior against the calculated safe speed.
- d. It provides a daily trip summary comparing actual speeds in red spots to its calculated safe speeds which are then sent to the driver/safety manager to help improve driver coaching.

### **What does this mean for the bottom line?**

To illustrate in quantitative terms that feared increases in costs related to safety will instead result in improved profitability, a study of publicly traded, US trucking companies was undertaken by RoadAware. The analysis gathered published financial data from these companies. The companies used in the analysis have trucking as their core activity and for the purpose of this analysis the main activity is transportation, and the primary reported costs for the line item "Insurance and Claims" are related to the trucking activity.

The Insurance and Claims costs were plotted as a percentage of Net Income and Net Income as a percentage of reported Revenue for each company. Plotted on the same chart, the results are as follows:



For these public companies as insurance and claims costs go down, the net income percentage goes up, an indication of higher profitability for these companies.

The use of **Road-Aware** as a driving aid is estimated to reduce crashes by 15% or more. This estimate is reached by eliminating rollover as the first harmful event (5%), also eliminating collision with a fixed object as the first harmful event (8%) and reducing truck at fault collisions by 5% which gives a total reduction of 18%<sup>7</sup>.

This result can be cross checked by combining the observation that 30% of truck crashes occur on curves and that excess speed is a causal factor in 45% of those crashes. Finally, it can also be compared to results from the use of other systems that record driver behavior such as critical event reporting and speeding event recording that have reported premium reductions of 20% in the first case and 38% in the second.

The costs associated with truck crashes are significant, especially when considering both direct costs and indirect costs (see Table). Significant costs associated with truck-involved injury and fatal crashes are societal costs – lost productivity in terms of wages/household work and reduced quality of life for individuals directly involved in a crash, as well as lost productivity for individuals impacted by the delays and congestion associated with a crash. As well as direct cost to the trucking company. The American Transportation Research

Crash Type	Average Cost per Crash in 2015	Average Cost using 2022 CPI (2015*1.24)
PDO	\$ 20,917	\$ 25,937
Injury	\$ 270,222	\$ 335,075
Fatal	\$ 4,988,379	\$ 6,185,590

Institute (ATRI) provided an estimate of crash costs based on 2015 costs<sup>8</sup>. RoadAware applied the consumer price index to bring these costs to 2022 estimates.

Reduced crashes translates directly into lower insurance and claims costs and greater profitability.

## **Conclusion**

Talent development is one key to the success of a motor carrier's overall risk management strategy. By providing ongoing training and development opportunities as part of their efforts, motor carriers can reduce the financial losses caused by employee turnover, roadside inspections, vehicle accidents, and workplace injuries, to name a few. However, for all the advantages a positive training experience can offer, motor carriers should be mindful of the costs associated with bad training experiences as well.

The data from UBI and Smart Haul provide strong evidence that a company can expect insurance premium discounts in the order of 5-20% with an average of 10-12% or \$1,200 per year per unit. The driver's driving behavior is observed and events (hard braking, hard acceleration etc.) are analyzed and reported for company action. Looking at a fleet of 250 units with a majority of safe drivers, a company could look forward to yearly premium discounts in the order of \$300,000.

**Road-Aware**, in a thoughtful company program to enhance safety, it can be reasonably expected that savings in crash claims of 18% or about \$2,000 per year per truck in reduced premiums or the equivalent payouts for crash claims. Savings for a 250 unit company would be in the order of \$550,000 a year.

## **Reference List**

<sup>1</sup>[What is Progressive Smart Haul program for truckers \(commercialinsolutions.com\)](https://commercialinsolutions.com)

<sup>2</sup>[The ultimate guide to truck and fleet insurance. | Motive \(gomotive.com\)](https://gomotive.com)

<sup>3</sup>[Forgetting curve - Wikipedia](https://en.wikipedia.org/wiki/Forgetting_curve)

<sup>4</sup>[The Hawthorne Effect: How the Process of Being Watched Affects Our Performance | Thriveworks](https://thriveworks.com)

<sup>5</sup>[How to Observe | Psychology Today](https://psychologytoday.com)

<sup>6</sup>[We Work Harder When We Know Someone's Watching \(hbr.org\)](https://hbr.org)

<sup>7</sup>[Estimating the Reduction in Truck Crashes Aug .pdf \(wsimg.com\)](https://wsimg.com)

<sup>8</sup><https://truckingresearch.org/wp-content/uploads/2018/08/ATRI-Crash-Predictor-2018-Update-07-2018.pdf>