



OOIDA Foundation

RESEARCH • SAFETY • ECONOMICS

WHITE PAPER

Examination of Publically Available Data from FCMSA on CSA Scores and Motor Carriers

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Introduction

The Federal Motor Carrier Safety Administration's (FMCSA) mission statement is to focus "on reducing crashes, injuries, and fatalities involving large trucks and buses." A primary component of the Agency's mission includes the regulation of the hours-of-service (HOS) of commercial motor vehicle (CMV) drivers. In April 2014, FMCSA released a supplemental notice of proposed rulemaking (SNPRM) to mandate electronic logging devices (ELDs), previously called electronic on-board recorders, in all CMVs that are required to prepare HOS records of duty status (RODS). According to FMCSA's Preliminary Regulatory Impact Analysis, "FMCSA **believes** that increasing the use of ELDs would **improve compliance** with the HOS rules and improve safety by **decreasing the risk of fatigue-related** crashes attributable to violations of the applicable HOS regulations (**emphasis added**)."¹

However, the Owner-Operator Independent Drivers Association (OOIDA), the largest non-for profit national trade association representing the interests of over 150,000 small business trucking professionals and professional truck drivers, has continually demonstrated through research and comments that ELDs have no correlation to safety.^{2 3 4} Furthermore, FMCSA's own research provides evidence that ELDs do not increase HOS compliance, but can contribute to the overall problem of fatigue.

In addition to the HOS regulations, FMCSA, along with the National Highway Traffic Safety Administration (NHTSA), are currently in the process of developing a NPRM to mandate the installation of speed limiting devices on CMVs. The rulemaking is in response to the petitions of safety groups and large carriers that desire these devices, called speed limiters (SLs). Nevertheless, OOIDA has stated that there is no clear evidence that supports that the use of SLs will improve safety. In fact, the mandatory utilization of SLs for all CMVs would decrease safety, since the interaction between large trucks and automobiles would increase.

It is important to note that OOIDA does not condone speeding or other additional unsafe driving habits, such as exceeding the HOS limits. In fact, OOIDA has urged truckers to comply with all state laws and federal regulations. However, instead of mandating ELDs and installing SLs in CMVs, OOIDA desires to put safe drivers in trucks.

Background

In January 2013, the OOIDA Foundation (OOFI), which is the research and educational arm of the Association, conducted an analysis of publically available information on FMCSA's Compliance, Safety,

¹ Brian Preslopsky et al., *Preliminary Regulatory Evaluation of Electronic Logging Devices and Hours of Service Supporting Documents Supplemental Notice of Proposed Rulemaking: Regulatory Impact Analysis*, FMCSA (2014), pg. i.

² *Review of FMCSA's Evaluating the Potential Safety Benefits of Electronic Hours-of-Service Recorders Final Report*, OOFI (May 2014).

³ *Review of FMCSA's Attitude of Truck Drivers and Carriers on the Use of Electronic Logging Devices and Driver Harassment: By the Numbers*, OOFI (November 2014).

⁴ OOIDA Comments, March 2007.

and Accountability (CSA) Safety Measurement System (SMS) website⁵ in order to present data that represented the real-world safety outcomes of ELDs and SLs.

As part of the analysis, the OOFI examined the CSA SMS scores of large carriers that had both ELDs and SLs installed, as well as those carriers that did not have these devices installed, which OOFI separated into two cohorts (asset carriers and non-asset carriers). OOFI reviewed the following data in order to identify the correlation between ELD and speed limited equipped fleets with improved safety in HOS compliance, in speeding violations, and in crashes when compared to non-ELD equipped and non-speed limited fleets. The examined data included:

- Percentages of Crashes per number of power units (PU)
- Percentage of Crashes per number of drivers
- Percentage of Crashes per 100 million vehicle miles travelled (VMT)

According to FMCSA, high percentile scores in the seven Behavioral Analysis Safety Improvement Categories, also called BASICs, are directly related to safety on the highways. Although the Government Accountability Office recently published a report that demonstrated that the CSA SMS scores are unreliable predictors of crash risk,⁶ the Agency has stated that the Unsafe Driving, the HOS Compliance, and the Vehicle Maintenance BASICs do have a positive and significant relationship to crashes. However, it is important to note that both the statistics and the methodology utilized to formulate the CSA scores and percentiles have been challenged by several notable research groups and individuals.

Utilizing the same methodology as the 2013 analysis, OOFI has updated the report on the examination of publically available data from FMCSA on CSA SMS scores of large asset and non-asset carriers.

Selection of Carriers

In order to select carriers to examine the safety outcomes of ELDs and SLs, OOFI first selected large motor carriers that had been active in pursuing a mandate for the installation of ELDs and SLs. These large carriers, which are listed below, are classified as asset carriers. Secondly, OOFI focused on carriers that did not have ELDs and SLs installed, which were classified as non-asset carriers. These carriers predominately utilized owner-operators. Only the largest non-asset carriers were selected in order for the two cohorts to be comparable.⁷

⁵ <https://csa.fmcsa.dot.gov/>

⁶ *Federal Motor Carrier Safety: Modifying the Compliance, Safety, Accountability Program Would Improve the Ability to Identify High Risk Carriers*, GAO (February 2014).

⁷ Dart uses or is beginning to use EOBRs for a majority of their owner-operated trucks. Dart has stated that they do not demand these from their owner-operators unless they show a pattern of non-compliance on their logs which would be reflected in their CSA scores.

Table 1: List of Large Asset and Non-Asset Carriers

Asset Carriers	Non-Asset Carriers
Werner	Dart (has started requiring ELDs)
Schneider	Bennett
J.B. Hunt	Landstar Inway
Swift	Landstar Ranger
C.R. England	
USExpress	
Knight	
Maverick	

Results

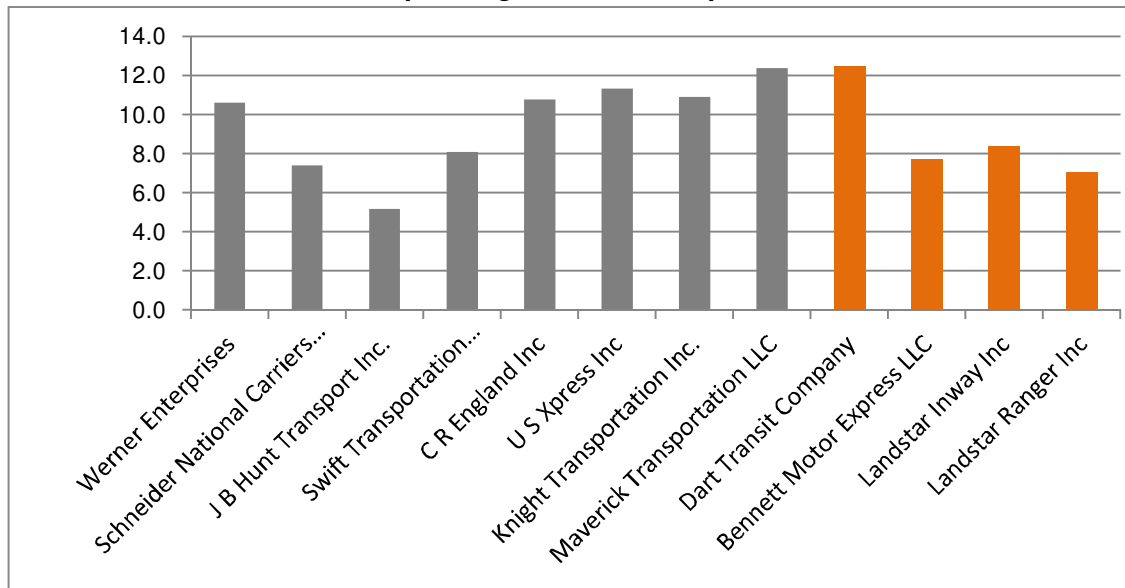
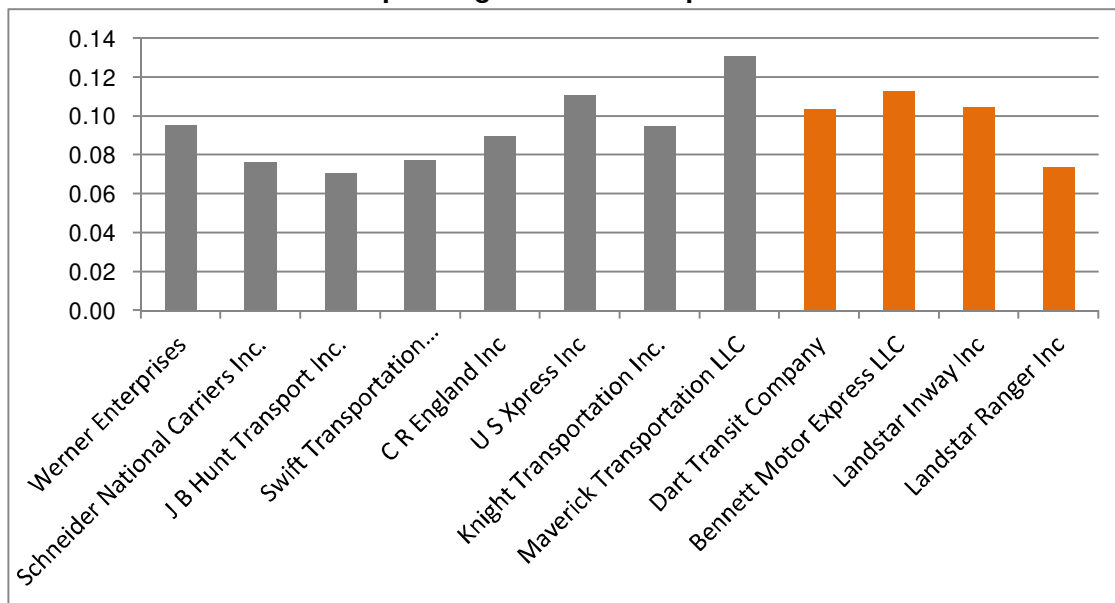
In December 2010, FMCSA released a study entitled, “Research Safety Impacts of Speed Limiter Device Installation on Commercial Motor Vehicles: Phase II,” which stated, “The analysis found that the cohort without SLs had a significantly higher crash rate. However, because of the **data limitations and data quality**, the research could not definitely attribute the effect to the presence of an active SL (**emphasis added**).” Nonetheless, without including new data collection or new research, the Agency published a “second final report” in 2012 that stated, “The findings showed strong positive benefits for SLs.” While this understandably sparked controversy, including a white paper from one of the study’s original co-authors demonstrating a number of limitations of the report’s findings,⁸ the following research will help to clarify the safety outcomes of SLs.

The premise of SLs is that by reducing the highest possible speed a CMV may travel, speeding violations, along with crashes and the severity of crashes, would be reduced. Therefore, by utilizing this premise held by safety groups, large carriers, and FMCSA, it would be reasonable to assume that carriers equipped with speed limiting devices would have fewer speeding violations. However, OOFI discovered that regardless of the CSA SMS score, speed limited carriers had an equal, and often higher, number of speeding violations than those carriers that were not equipped with SLs.

In order to assess the data, OOFI focused on the rate of speeding violations per 100 PUs and 100 MVMT for each of the motor carriers. For the asset and non-asset carriers, the average violation rate per 100 PU was 9.60 and 9.05, respectively, while the average violation rate per 100 MVMT was 0.09 and 0.10.

The following graphs indicate that SLs had little or no effect on the rate of speeding violations, as in many situations the asset carriers had a worse safety performance, which was also confirmed by their Unsafe Driving CSA SMS scores. The data demonstrates that SLs do not eliminate the practice of speeding, but instead suggest that speeding occurs on rural, urban, and/or arterial roads where the speed limit is lower.

⁸ Steven L. Johnson, *Response to Research on the Safety Impacts of Speed Limiter Device Installations on Commercial Motor Vehicles: Phase II*, (March 2012).

Chart 1: Speeding violation rate per 100 PUs**Chart 2: Speeding violation rate per 100 MVMT**

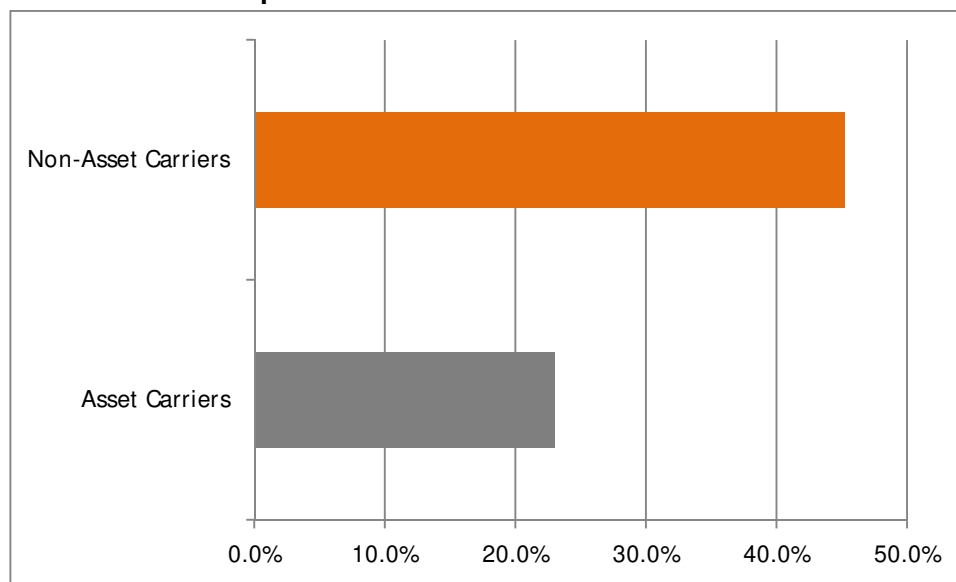
In 2007, OOFI conducted a survey in which its members stated that they were more likely to speed in areas where the speed limit was less than the SL setting in order to make up both miles and lost time when they drove for motor carriers that equipped SLs on their trucks. Therefore, if the Agency moves forward on the SL NPRM, it is imperative that FMCSA evaluates the safety effect that mandatory SLs might have on increased speeding on arterial and urban roads.

Hours-of-Service Compliance

In April 2014, FMCSA released a study entitled, “Evaluating the Potential Safety Benefits of Electronic Hours-of-Service Recorders Final Report.” The research team’s premise behind the safety of ELD utilization was to increase HOS compliance, which in turn would reduce driver fatigue, resulting in increased safety performance. Nevertheless, the study was not able to detect a safety benefit for DOT-recordable crashes or fatigue-related crashes, which is also confirmed in the present analysis.

First, OOFI utilized the CSA SMS scores in order to evaluate HOS compliance amongst the asset and non-asset carriers. The HOS BASIC indicated that the asset carriers had a better safety record. The average percentile score for the asset carriers was 23%, while non-asset carriers had an average score of 45.3%, thus demonstrating that asset carriers are more compliant with the HOS regulations. However, according to FMCSA’s study, this should result in a better safety performance in terms of reduced crashes.

Chart 3: HOS Compliance Score between Asset and Non-Asset Carriers



In order to test the Agency’s theory, OOFI compared the crash rate per 100 PUs and per 100 MVMT between the asset and non-asset carriers. OOFI discovered that in most cases the asset carriers had a higher crash rate. Overall, the average crash rate per 100 PUs was 10.28 for asset carriers and 7.36 for non-asset carriers, whereas the crash rate per 100 MVMT was .10 and .08, respectively. Therefore, although the asset carriers have a better HOS Compliance rating, their crash rate is much higher, which invalidates the Agency’s premise behind the mandating of ELDs.

Chart 4: Crash rate per 100 PUs

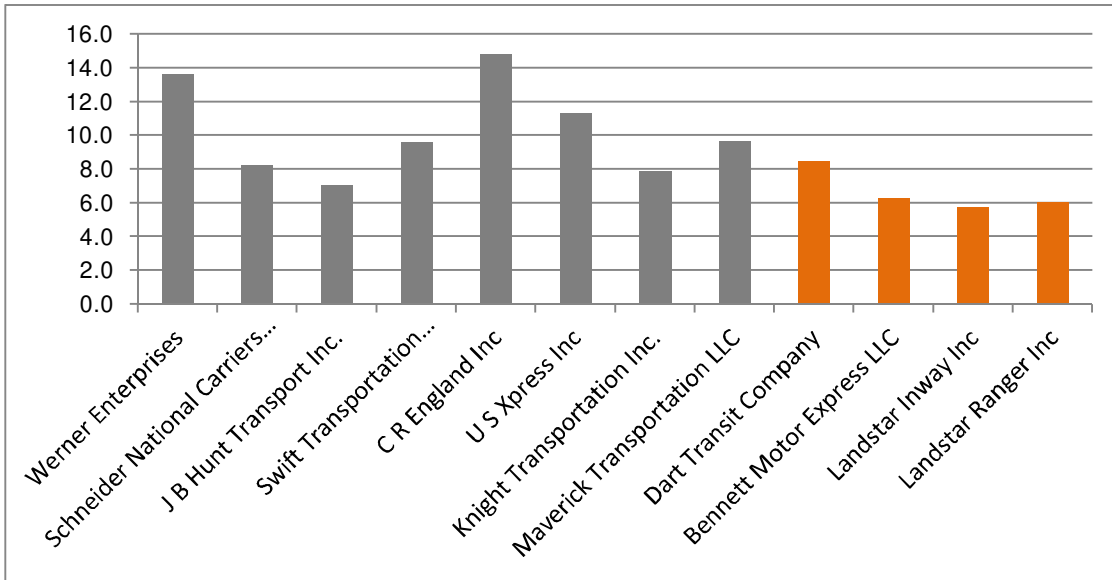
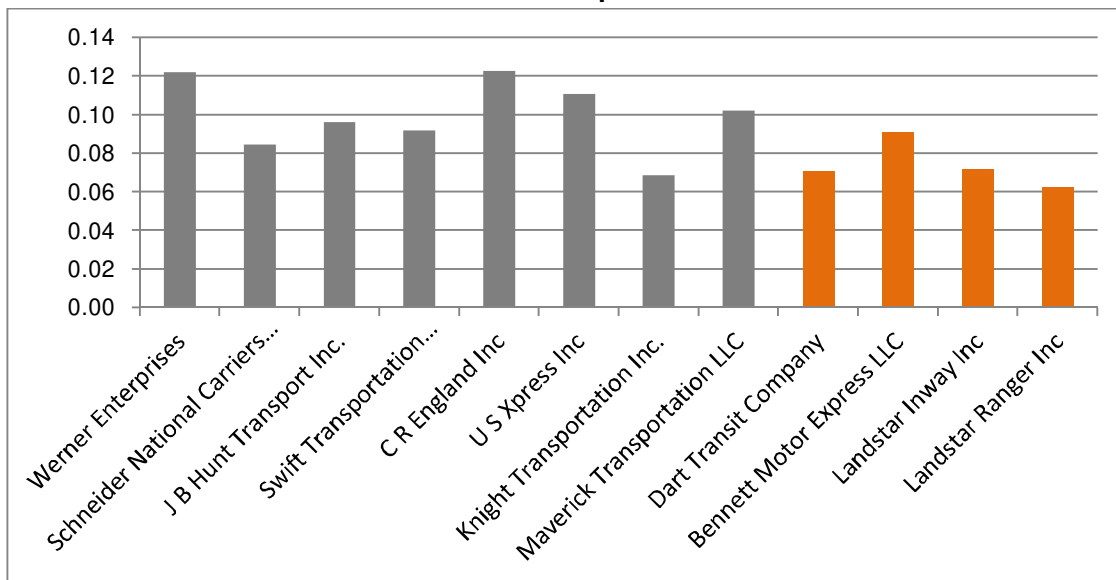


Chart 5: Crash rate per 100 MVMT



Average Number of Miles to Crash

The OOFI also compared the number of miles driven between crashes by gathering MCS-150 data for each of the carriers. Three of the top four safety performing carriers were non-asset carriers, in other words, the three carriers had the highest vehicle miles traveled before recording a crash. For both asset and non-asset carriers, the average number of miles before a crash was approximately 1 million and 1.4 million, respectively

Table 2: Average Number of miles to crash

Carriers	Miles to Crash
Landstar Ranger Inc.	1,593,016
Knight Transportation Inc.	1,456,311
Dart Transit Company	1,415,859
Landstar Inway Inc.	1,389,091
Schneider National Carriers Inc.	1,182,075
Bennett Motor Express LLC	1,096,742
Swift Transportation Corporation	1,088,111
JB Hunt Transport Inc.	1,040,242
Maverick Transportation LLC	979,339
U S Xpress Inc.	902,779
Werner Enterprises	819,133
C R England Inc.	815,150

* The non-asset carriers are bolded

Concerns with CSA

Although limited in scope, the research reveals serious concerns with the Agency's proclamation that CSA is an effective predictor of crash risk. In 2014, FMCSA updated the CSA SMS webpage so that the BASICs appear from left to right based upon their correlation to crash risk. The first four categories are Unsafe Driving, Crash Indicator, HOS Compliance, and Vehicle Maintenance. The Crash Indicator BASIC is not made public.

Upon examining the data from the CSA SMS webpage, the Unsafe Driving BASIC unveiled that non-asset carriers have a better safety performance, which is also confirmed by the actual crash rate. Conversely, the HOS Compliance and the Vehicle Maintenance BASICs both indicated that asset carriers have a higher safety rating, but yet as demonstrated previously, asset carriers have a higher crash rate. The data highlights serious concerns about the accuracy of the CSA SMS scores.

Furthermore, the research certainly brings into question the safety outcomes of ELDs and SLs and their usefulness as a safety technology. Instead, the analysis opens the possibility that the utilization of ELDs and SLs impose a safety hazard rather than a safety benefit, especially when considering in conjunction the most common compensation method, cents per mile. This may increase the attitude that drivers are operating against a clock.

The following charts show the CSA SMS percentile score for each carrier compared to the actual crash rate per 100 PUs. For the charts, OOFI focused on three of the first four BASICs, Unsafe Driving, HOS Compliance, and Vehicle Maintenance. The Crash Indicator BASIC was not examined because, as previously mentioned, its score is not made public.

Chart 6: Unsafe Driving BASIC compared to crash rate per 100 PUs

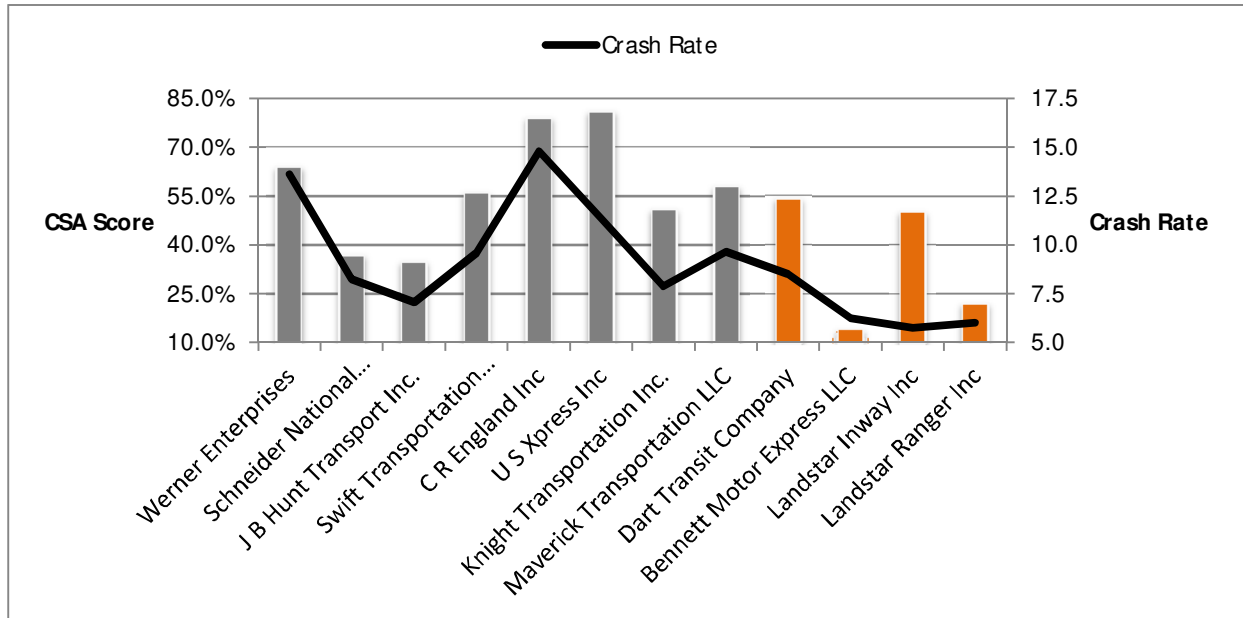


Chart 7: HOS Compliance BASIC compared to crash rate per 100 PUs

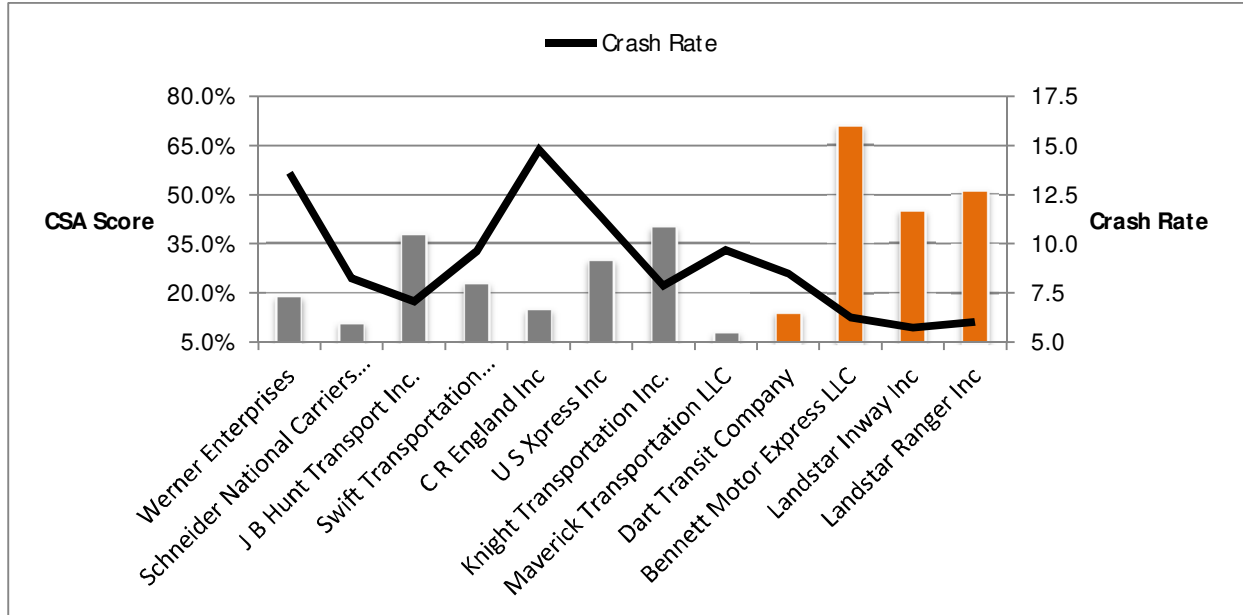
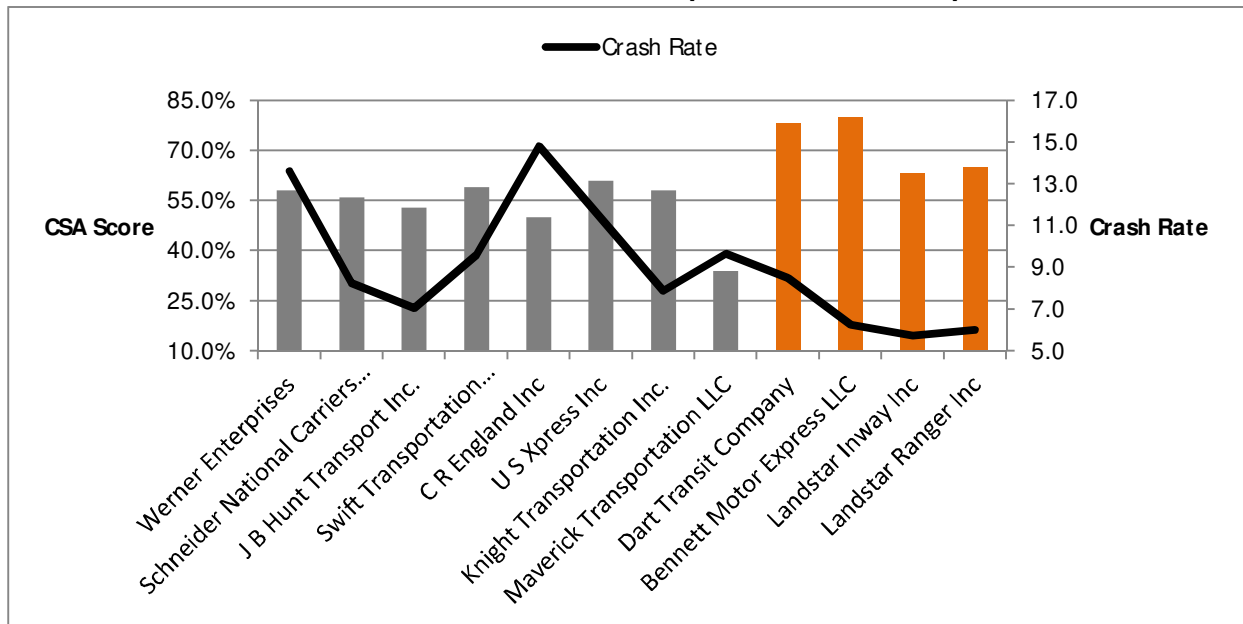


Chart 8: Vehicle Maintenance BASIC compared to crash rate per 100 PUs

Conclusion

The premise behind safety technologies such as ELDs and SLs is that they will increase HOS compliance and eliminate speeding, thus increasing on-road safety by reducing crashes. However, when analyzing real-world data, the proclaimed safety benefits of these devices are not evident. Instead, the data tells a different story altogether by indicating that carriers that utilize such safety technologies experience more crashes than those carriers that do not. In the end, it is unmistakable that before FMCSA continues with any further rulemaking, the Agency must validate their premises before conducting further research.

Table 3: Carrier violation and crash data

Carrier	PUs	Drivers	Miles (2013)	Speed Violations	HOS Violation	Crashes	Crash Rate Per 100 PU	Crash Rate Per 100 Driver	Crash Rate Per 100 MVMT	Miles to Crash
Asset Carriers										
Werner Enterprises	8,220	10,203	917,428,586	874	408	1,120	13.6	11.0	0.12	819,133
Schneider National Carriers Inc.	11,103	12,480	1,081,598,243	825	314	915	8.2	7.3	0.08	1,182,075
JB Hunt Transport Inc.	12,428	13,841	911,252,409	643	643	876	7.0	6.3	0.10	1,040,242
Swift Transportation Corporation	17,989	21,026	1,879,168,002	1,458	932	1,727	9.6	8.2	0.09	1,088,111
C R England Inc.	4,825	6,895	582,017,382	521	340	714	14.8	10.4	0.12	815,150
U S Xpress Inc.	6,013	7,030	616,598,155	683	430	683	11.4	9.7	0.11	902,779
Knight Transportation Inc.	3,920	3,920	* 450,000,000	428	393	309	7.9	7.9	0.07	1,456,311
Maverick Transportation LLC	1,438	1,442	** 136,128,070	178	31	139	9.7	9.6	0.10	979,339
Non-Asset Carriers										
Dart Transit Company	1,930	2,022	232,200,888	241	52	164	8.5	8.1	0.07	1,415,859
Bennett Motor Express LLC	864	864	59,224,062	67	270	54	6.3	6.3	0.09	1,096,742
Landstar Inway Inc.	3,749	3,997	298,654,658	313	387	215	5.7	5.4	0.07	1,389,091
Landstar Ranger Inc.	4,784	5,224	** 458,788,624	337	587	288	6.0	5.5	0.06	1,593,016

* Miles traveled 2014

** Miles traveled in 2012

Table 4: Carrier CSA SMS percentile scores

Carriers	Unsafe Driving	Crashes	HOS Compliance	Vehicle Maint	Drug and Alcohol	Driver Fitness
Asset Carriers						
Werner Enterprises	64%	1,120	19%	58%	45%	48%
Schneider National Carriers Inc.	37%	915	11%	56%	13%	37%
JB Hunt Transport Inc.	35%	876	38%	53%	1%	35%
Swift Transportation Corp.	56%	1,727	23%	59%	39%	61%
C R England Inc.	79%	714	15%	50%	25%	47%
U S Xpress Inc.	81%	683	30%	61%	23%	71%
Knight Transportation Inc.	51%	309	40%	57%	7%	49%
Maverick Transportation LLC	58%	139	8%	34%	0%	15%
Non-Asset Carriers						
Dart Transit Company	54%	164	14%	78%	1%	37%
Bennett Motor Express LLC	14%	54	71%	80%	0%	50%
Landstar Inway Inc.	50%	215	45%	63%	6%	14%
Landstar Ranger Inc.	22%	288	51%	65%	3%	15%

Bibliography

- GAO. (2014). *Federal Motor Carrier Safety: Modifying the Compliance, Safety, Accountability Program Would Improve the Ability to Identify High Risk Carriers*. United States General Accountability Office.
- Johnson, S. L. (2012). *Response to Research on the Safety Impacts of Speed Limiter Device Installations on Commercial Motor Vehicles: Phase II*.
- OOIDA Foundation. (2014). *Review of FMCSA's Attitude of Truck Drivers and Carriers on the Use of Electronic Logging Devices and Driver Harassment: By the Numbers*. Owner-Operator Independent Drivers Association Foundation.
- OOIDA Foundation. (2014). *Review of FMCSA's Evaluating the Potential Safety Benefits of Electronic Hours-of-Service Recorders Final Report*. Owner-Operator Independent Drivers Association Foundation.
- Preslopsky, B., McGonegal, S., Seymour, B., Blackman, K., Relihan, K., Simon, D., et al. (2014). *Preliminary Regulatory Evaluation of Electronic Onboard Recorders and Hours of Service Supporting Documents Supplemental Notice of Proposed Rulemaking*. FMCSA.