Research on the Safety Impacts of Speed Limiter Device Installations on Commercial Motor Vehicles

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Background
Speeding (i.e., exceeding the speed limit or driving too fast for conditions) was a contributing factor in 8 percent of all reported large truck crashes. Moreover, the Large Truck Crash Causation Study reported that 22.9 percent of all large truck crashes and 10.4 percent of large truck/passenger car crashes were coded as “traveling too fast for conditions”. One technology used by commercial truck fleets to lower the overall top speed of their trucks is a speed limiter (SL). SLs are devices that interact with a truck engine to only permit the attainment of a pre-programmed maximum speed (e.g., the truck can’t exceed a pre-set speed of 65 mi/h unless the truck is traveling down a grade). This study assessed the safety benefits of SLs on commercial trucks as they operated during normal revenue-producing deliveries (under real-world driving pressures and situations).

Method
This study collected crash data from 20 commercial truck fleets in calendar years 2007, 2008, and 2009. Some fleets did not provide crash records for all three calendar years or information on each truck’s mileage (i.e., exposure); thus, the data set was unbalanced and the number of trucks per year (truck-year) was used as an exposure measure. All trucks in the current study were Class 7 or 8 trucks. A speeding truck is associated with many different crash types, and trucks equipped with an active SL will generally not have a crash when the truck is traveling above the pre-set speed (as the truck is prohibited from traveling above the pre-set speed unless the truck is traveling down a grade). Trained research personnel, who were crash data set domain experts, were blind to the SL status of each commercial fleet reviewed several data elements included in the crash file to determine if the crash was an “SL-relevant crash”. A SL-relevant crash was a crash where an active SL would be most effective in mitigating or preventing high-speed [posted speed limit 97 km/h (60 mi/h) or greater] truck crashes on highways. No trucks in the current study had a SL setting of less than 97 km/h (60 mi/h).

Results
The final dataset contained a total of 138,075 truck-years (125,392 in the SL cohort and 12,683 in the non-SL cohort). The safety impact of SLs was evaluated by the SL-relevant crash rate, which was defined as the ratio of crashes divided by the number of truck-years multiplied by 100. The presence of an SL showed a significant association with the SL-relevant crash rate (p = 0.0295). The estimated SL-relevant crash rate ratio was 1.94 (95 percent Confidence Interval = 1.07 to 3.49), which indicates the SL-relevant crash rate for carriers in the non-SL cohort was 1.94 times greater than fleets in the SL cohort.