Shoulder Belt Usage by Commercial Motor Vehicle Drivers

Final Report

Prepared For:

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

December 2005

Executive Summary

Introduction

In 2004, 5,190 people were killed in crashes involving large trucks. Typically, less than 20% of commercial motor vehicle (CMV)-related fatalities are occupants of the truck. Due to the sheer mass of CMVs, even relatively low speed impacts can result in major damage to passenger vehicles when they are also involved. Most crashes that are fatal to truck drivers involve running off the road and rolling over or hitting a large stationary object (e.g., tree, bridge abutment, culvert). Many of the drivers killed in these types of crashes died because they failed to wear their shoulder belts and were ejected from the CMV.

By 2008, the Federal Motor Carrier Safety Administration (FMCSA) aims to increase shoulder belt use among CMV drivers and to reduce the total number of CMV-related fatalities to 1.65 per 100 million CMV miles traveled. The 2005 CMV study, aimed at replicating the 2002 study, provides FMCSA the data to assess progress in increased shoulder belt use and to determine how best to allocate its resources to help reduce fatalities. Based on the data collected in 2002, estimates of shoulder belt usage rate changes among CMV drivers were produced. To the extent possible, minimal changes to the sites, vehicle sample, and procedures were made to ensure that results of this 2005 study were directly comparable to the 2002 study. Although this approach did provide comparable data, post-collection reviews point to a number of issues that should be addressed to improve validity and feedback for strategic program planners.

Like the 2002 study, the 2005 study was a nationally representative sample survey of shoulder belt usage by CMV drivers (of Class 7 and Class 8 vehicles) throughout the United States. Note that estimates only include drivers restrained by shoulder belts, not

by lap belts. This is important to note since it may imply that overall seat belt use is somewhat underreported.

Methodology

In 2002, sites were selected using a three-step process resulting in 12 primary sampling units (PSUs). Approximately 10 sites were selected within each PSU. During both the 2002 and 2005 collection periods, observations were made at a total of 117 locations on interstate exit/entrance ramps, near trucks stops, and at signalized intersections.

The process of collecting the data was largely the same between collection periods. Observers were stationed at the selected sites and captured site, vehicle, and driver characteristics for those vehicles identified as either Class 7 or 8 vehicles. To maximize observation quality, observers used SUVs with tinted windows to provide a somewhat higher vantage point and to conceal their purpose from the passing CMVs. Using specially-designed forms and binoculars (for cases where close proximity to the passing vehicles was not possible or ideal), the observers captured data for approximately one hour per site. Observers worked alone to complete the sites in a PSU with completion of a PSU in one to two days. Their ability to capture all aspects of the vehicle and driver shoulder belt condition was quite good, capturing over 300 observations within each PSU.

Results

In 2005, a total of 4,740 trucks were observed, about 20% more than were observed in 2002. Of these, the observers were unable to determine belt usage in 56 (or 1.2%) of the cases. In 19 additional cases (.4%) the shoulder belt was observed to be incorrectly worn. Records with incorrect or unknown belt use were excluded from the analysis.

The 2002 overall shoulder belt usage rate for all Class 7 and 8 trucks combined was 48%, with a statistically significant increase in 2005 to 54% ($p < .001$). In 2005, drivers of passenger cars (83%), SUVs/vans (85%), and pickup trucks (73%) all have significantly higher usage rates than the operators of all commercial vehicles category (54%). This reflects a similar rate of increase to that for passenger vehicles from NOPUS though the level of use is significantly lower.

The 2002 usage rate for drivers of those units where the truck was identified as a major regional or national fleet was 55%, versus 44% for independent or local fleets. The usage rate increased significantly to 63% in 2005 for the major national or regional fleets ($p<.001$). The slight drop in usage rate for independent or local fleets was not statistically significant. This suggests that local fleets may either not be getting the message or may not be as motivated to use belts as their long-haul counterparts. Alternatively, it may suggest that they are more likely to have lap belts (i.e., referred to as Type 1 restraints in Federal regulation) than shoulder belts (i.e., Type 2) and were, thus, less likely to be observed as users.

Among cargo types, the highest usage rates were observed among the drivers of single tankers and hazmat tractor-trailer combinations. The lowest rates were observed in single dump trucks and bobtails. In 2002 the drivers of tractors pulling trailers with a hazmat placard displayed had the highest usage rate (67%) of any of the various categories observed and in 2005 tied for highest usage rate (75%) with single tankers. All cargo type comparisons were statistically significant at the $p<.05$ level. There were significant increases in usage rates between 2002 and 2005 for single vans (51% to 62%, $p<.001$), single tankers (61% to 75%, $p=.016$), all others (39% to 47%, $p=.010$), all Class 8 (47% to 54%, $p<.001$), and non- hazmat Class 8 (47% to 54%, $p=.001$). The 2002 to 2005 changes for single dump trucks, doubles, bobtails, and hazmat were not statistically significant.

In 2005, the usage rate among commercial vehicles was observed to be higher on weekends (59%) than on weekdays (53%) ($p=.039$). In 2002 the reverse was observed, but this difference is not statistically significant. The increase in usage rates from 2002 to 2005 is statistically significant for both weekdays ($p=.036$) and weekends ($p<.001$). However, it is possible that these differences are a result of which states were observed on weekends in the two study periods since the day of week variable was not collected in a way that allowed it to be independently assessed with respect to the state and PSU variables.

A number of recommendations are provided for implementation of future survey installments. The recommendations focus on improving the sample and clarifying vehicle classifications. Two recommendations are made for the sample. The first recommendation is to select new sites either through drawing a probability sample or using the NOPUS sites (collecting CMV data in conjunction with NOPUS data). The second suggestion is expand the sample to observe all CMVs which fall under FMCSA's purview (i.e., CMVs over 10,000 pounds, interstate, and/or hazmat). Additionally, the vehicle classifications should be modified to be more clearly defined and follow industry standards.

To obtain a copy of the 2005 Shoulder Belt Usage by Commercial Motor Vehicle Drivers Final Report, contact Janet Kumer, FMCSA Safety Belt Program Manager, at (202) 493-0538 or janet.kumer@fmcsa.dot.gov.