Background

Truck crashes represent a significant problem on our nation’s highways. This project evaluated large-truck crash data from the Large Truck Crash Causation Study (LTCCS), two large-truck naturalistic data sets, the Naturalistic Truck Driving Study and the Drowsy Driver Warning System Field Operational Test [combined into one large naturalistic driving (ND) data set], and the General Estimates System (GES). A sophisticated understanding of traffic crashes/events recognizes that each specific scenario has its own distinct blend of events and contributing factors. The LTCCS and ND data sets address full arrays of crash/event scenarios, contributing factors, and conditions of occurrence. Some comparative findings may be applicable to traffic events (crashes and safety-critical events) in general, but the most important findings will likely be specific to particular driving scenarios. Accordingly, this project focused primarily on several selected scenarios, although it also included generalized comparisons. Such comparisons between these data sets provided the potential for cross-validation, extrapolation and interpolation of findings, and the generation of new hypotheses that may be addressed in future studies. Findings are directly relevant to crash prevention, whether via future research and development or through information conveyed directly to safety professionals and drivers.

Methods

This project included a generalized comparative analysis of the three data sets (LTCCS, GES, and ND), and then focused on five specific analyses using only two data sets (LTCCS and ND), more specifically, the project analyses included: generalized comparative analysis, event type (rear-end truck striking), contributing factors (truck driver fatigue and truck driver excessive speed), condition of occurrence (high traffic density), and complex scenario “crash trifecta” (pre-event speeding, tailgating, or other unsafe behavior; transient driver inattention; and unexpected traffic event). Each analysis involved unique comparisons and each should serve as a prototype for other analyses of a similar nature within that dimension. Findings are directly relevant to crash prevention, whether via future research and development or through information conveyed directly to safety professionals and drivers.

Results

A synthetic risk ratio analysis on the associated factor, Following Too Closely, indicated that truck drivers in the LTCCS were 1.34 times more likely to be involved in a crash, than an ND crash-relevant conflict, if they were following too closely (i.e., tailgating). This comparative analysis suggested these types of cross comparisons using the LTCCS and ND data sets were feasible. There also appeared to be a trend in the percent of all three crash trifecta elements as the severity level of the crash/event in the ND data set increased.

LTCCS statistics are disaggregated by truck type, and by several crash categories.

Project analyses will include:

- Generalized comparative analysis
- Event type:
  - Rear-end, truck striking
- Contributing factors:
  - Truck driver fatigue
  - Truck driver excessive speed
- Condition of occurrence:
  - High traffic density
- Complex scenario “crash trifecta” which consists of three separate, but converging events:
  - Pre-event speeding, tailgating, or other unsafe behavior
  - Transient driver inattention
  - Unexpected traffic event