Police Accident Report (PAR) Coding Test

The Federal Motor Carrier Safety Administration (FMCSA) is dedicated to saving by reducing crashes, injuries and fatalities involving large trucks and buses. The Agency is committed to the continuous improvement of its Safety Measurement System (SMS), the tool for monitoring carriers for intervention. As part of this commitment, the Agency is looking into the feasibility of weighting crashes in SMS differently depending on the role of the motor carrier in those crashes.

As part of this effort, FMCSA conducted an analysis that tested the coding accuracy and consistency of Police Accident Reports (PARs) for consideration as a potential source of information for determining a motor carrier's role in crashes. Results from this analysis are presented in the following pages.

This analysis constitutes a first step in the Agency's effort to address this issue and provides information that can be used in developing a crash weighting system. It provides useful information about the consistency and accuracy of PARs; but, it does not address other key questions: whether or not the carrier's role in the crash is a better indicator of future crash risk and what other information including public input should be used in a comprehensive crash weighting system.

The Agency plans to conduct additional research and analysis to further explore these questions. (See the Crash Weighting Research Plan on the CSA website at http://csa.fmcsa.dot.gov/documents/CrashWeightingResearchPlan_7-2012.pdf).

Coding Scheme for Motor Carrier Crash Accountability:
A Test of Using a Modified Critical Reason Methodology
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The Federal Motor Carrier Safety Administration (FMCSA) entered into a cooperative agreement with the National Highway Traffic Safety Administration (NHTSA) to test a method for coding motor carriers as being accountable or not accountable for large truck and bus crashes. The objective of this special study was to determine the feasibility for accurately and consistently coding accountability from only a police accident report (PAR). The test for accountability was whether the large truck or commercial bus could be coded with the critical reason for the critical crash event from just data on the PARs. In other words critical reason means accountability – when a truck or truck driver is coded with the critical reason the company responsible for that vehicle is judged to be accountable for the crash.

Background

Currently all crashes involving a large truck (gross vehicle or gross combination weight rating over 10,000 pounds) or a bus (seats for more 15, including the driver) that result in at least one fatality, one injury, or one vehicle being towed from the scene of the crashes as a result of disabling damage must be reported to FMCSA. These crashes are then put on the FMCSA records of the interstate motor carriers whose vehicles were involved in the crashes, and used against the carriers as part of the carrier's safety rating. FMCSA would like to divide these crashes into those for which the carrier should be held accountable, those for which the carrier should not be held accountable, and perhaps those where an accountability determination cannot be made. Then, only those crashes for which the motor carrier is accountable would be used against the carriers in their overall safety rating.

As part of the CSA 2010 project, FMCSA proposes to use the assignment of the crash critical reason as a measure of crash accountability. The DOT-reportable crash of any truck or bus where the CMV driver or CMV vehicle is assigned the critical reason for the crash will be counted as accountable to the motor carrier responsible for the vehicle at the time of the crash. This paper reports on results of a test to see if accountability for the over 100,000 crashes involving interstate motor carriers reported to FMCSA each year can be coded by examining the crash PAR.

Test Methodology

The methodology tested here for the crash critical reason coding was that developed for the Large Truck Crash Causation Study (LTCCS), a joint FMCSA-NHTSA effort conducted in 2001-2003 and reported to Congress in 2006. (See documents on the LTCCS methodology and results at   http://ai.fmcsa.dot.gov/ltccs/default.asp.) Crashes in the LTCCS were coded by NHTSA's National Automotive Selective System (NASS)

two zone centers in Buffalo and San Antonio. The critical event which made the crash inevitable and critical reason for the event were coded using PARs, data collected by trained crash investigators and State truck inspectors at the crash scene, police attending to the crash, hospital reports, interviews conducted with motor carriers after the crash, and other sources. The same methodology was used by NHTSA in their 2005-2007 National Motor Vehicle Crash Causation Study (NMVCCS) which examined 5,470 fatal, injury, and towaway crashes involving passenger vehicles.

This test for coding critical reasons for crashes from just the PARs included 1,221 police reported crashes. There were five groups of crashes coded:-
- 221 fatal crashes from the Large Truck Crash Causation Study (LTCCS),
- 200 A injury (incapacitating injury) crashes from the LTCCS,
- 200 B injury (non-incapacitating injury) crashes from the LTCCS,
- 200 C injury (possible injury) crashes involving at least one large truck from NHTSA's General Estimates System (GES) database of crashes, and
- 400 property-damage-only (PDO) crashes that involved at least one large truck and one vehicle (not necessarily the large truck or commercial bus) being towed from the crash scene from the GES database.

For the 621 LTCCS fatal, A injury, and B injury crashes the accountability study coders from the NASS zone center that *did not code* the LTCCS case coded accountability using only the crash PAR that was part of the LTCCS crash case file. The coding of crash critical reason between the original LTCCS coding by one zone center when the study was conducted in 2001-2003 was then compared with the critical reason assigned by the other zone center based solely on data drawn from the LTCCS case PAR.

For the 600 C injury and PDO crashes the crash critical reason was coded by both NASS zone centers for critical reason based solely on data from the PARs and the results were compared. The zone centers together developed a coding form to cover data collection from the PARs for all cases. In addition an interview form was developed for 600 GES crashes, in case the coders believed they needed additional data to help determine the crash critical reason.

The methodology for coding a PAR for crash critical reason is not a cookbook exercise. Two members of the CSA2010 team and the author watched a NASS Zone Center 1 coder open several GES crash case PARs and code the crashes for critical reason. The coder had experience coding LTCCS and NMVCCS cases over a seven-year period. After a quick perusal of the PARs the coder carefully read the crash narratives, studied the crash diagrams, and reviewed every data element collected. After considering all the data she used a crash reconstructive approach to put together a summary of the crashes in her mind, and made decisions on the assignment of critical reasons. Critical reason was the only variable coded for each case, but a quick explanation of the reasons behind the coding was often provided in a one or two sentence narrative for some of the crashes.

Results

The table below shows the degree of agreement and disagreement between the zone centers coding of all the 1,221 crashes.

For the 621 LTCCS crash cases agreement means that the critical reason assignment for a particular crash by the zone center staff who coded the reason from just the PAR in the LTCCS database in 2008 was the same critical reason coded by the other zone center staff several years ago using all the data from the LTCCS database (PAR included) for the crash case in question.

For the 600 crash cases taken from the GES database agreement means that for the crash case in question the staffs of the two zone centers coded the same critical reason using only the PARs. (Note: All data in GES is coded just from PARs.)

Intercoder Reliability Test
Coding Crash Critical Reason from PARS

| Crash Severity | Database | Number of crash Reports | Did Coders Agree? | | | | Total Trucks |
| | | | Yes | | No | | |
			Number of Trucks	Percent	Number of Trucks	Percent	
Fatal	LTCCS	221	241	92.3%	20	7.7%	261
A Injury	LTCCS	200	214	94.3%	13	5.7%	227
B Injury	LTCCS	200	228	91.2%	22	8.8%	250
C Injury	GES	200	189	91.3%	18	8.7%	207
PDO Towaway	GES	400	411	95.1%	21	4.9%	432
Totals		1,221	1,283	**93.2%**	94	6.8%	1,377

Explanatory notes on the table:
- Number of crash reports refers only to the PARs, even though the LTCCS files had much more data than just PARs.
- While there were 1,221 crash cases, the number of trucks and buses involved in the cases was 1,377. A number of crashes involved more than one truck or bus, and accountability was coded for every one of these vehicles. For simplicity sake the "trucks" is used instead of "vehicles" in three columns, since there were 24 total buses involved in the crashes and only two were motorcoaches.
- Tractors pulling a single semi-trailer made up 67.6 percent of the trucks involved in the crashes. Single unit trucks were 21.9 percent of the trucks.

The 93.2 percent agreement between zone centers on coding accountability seems very good. Discussion between zone centers concluded that the degree of agreement would increase with the development of a coding manual specifically for coding

crashes from just PARs. The manual used for this test was developed for the Large Truck Crash Causation Study.

A revised coding manual for assigning accountability would be considerably shorter, since crash associated factors would not be coded. In addition the manual would include several changes to the LTCCS and MNVCCS methodology to better reflect crash accountability. The single largest change will be the addition of right-of-way in the determination of critical reason. Several other minor changes will be made. The new codebook will be available to train new coders for assessing accountability.

One major concern at the beginning of the test was that for more minor crashes the PARs would not contain enough information for coding accountability. That did not prove to be the case. The percentage of agreement in the study does not go down as the crash consequences become less serious, as can be seen the table. Coders were surprised to see the high quality of the data in PARS for minor injury and property-damage-only crashes. One possible explanation is that when officers are confronted with crashes involving large vehicles, such as 18-wheelers, they may take more care in completing PARs.