Research Brief

Estimating Motor Carrier Management Information System Crash File Underreporting from Carrier Records

BACKGROUND

The Motor Carrier Management Information System (MCMIS) contains safety-related information on motor carriers operating in the U.S. and its territories. The MCMIS crash file houses data on U.S. crashes involving commercial motor vehicles. The analysis of this file is central in supporting FMCSA's mission to reduce crashes, injuries, and fatalities involving large trucks and buses.

The States extract data from their crash records and upload it to MCMIS through the SAFETYNET system. The MCMIS crash file is one source that FMCSA uses to identify trends in motor carrier safety, and it is part of a system to identify unsafe motor carriers for interventions. As such, it is critical that the data in the crash file be timely, accurate, and complete.

This FMCSA-sponsored research investigated the claim that motor carriers have a substantial number of crashes in their records that should be (but are not) contained in the MCMIS crash file. The goals of the project were to:

- Determine how many additional crashes in carrier records qualify to be in the MCMIS crash file.

- Estimate the magnitude of underreporting.

- Identify factors associated with underreporting.[i]

Table 1 provides a summary of key findings, based on the data from the six carriers evaluated in the study.

Table 1. Net MCMIS-reportable crashes associated with study carriers from review of the MCMIS crash file, carrier crash records, and State files.

Status of Crash Record	Number	Percent
Both in MCMIS & carrier files	3,885	53.6%
Incorrectly identified in carrier files as not reportable but in MCMIS	303	4.2%
Not in carrier files but in MCMIS	589	8.1%
Additional reportable crashes not in MCMIS but in carrier files	2,468	34.1%
Total	**7,245**	**100.0%**

STUDY APPROACH

For this study, the University of Michigan Transportation Research Institute (UMTRI) analyzed crash records from the internal files of six commercial motor carriers. These records represented crashes that the carriers had identified as meeting the MCMIS reporting thresholds (see Table 2). The crash records were then matched to the MCMIS crash file to determine how many had been reported to that file by the States. Unmatched crash records from the carriers' files were then searched for in State crash databases to determine how many had an associated crash report in these data systems. Crash reports not found in MCMIS but found in State files were then evaluated to determine how many should have been reported to the MCMIS file and why they were not. The remaining carrier crash reports—those not found in the MCMIS file or State crash files—were also evaluated.

Table 2 shows the reporting criteria for the MCMIS crash file.

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[i] States are required to report large truck and bus crashes without regard to whether they are commercial vehicles, so trucks and buses operated by government agencies or non-commercial entities would also be included.

However, the focus of the present study was on underreporting of crashes involving commercial carriers.

Table 2. Vehicle and crash severity thresholds for crash eligibility for MCMIS crash file.*

Element	Severity Threshold
Vehicle	• Truck with GVWR over 10,000 lb or gross combination weight rating over 10,000 lb *or* • Bus with seating for at least nine, including the driver *or* • Vehicle displaying a hazardous materials placard.
Crash	• Fatality *or* • Injury transported to a medical facility for immediate medical attention *or* • Vehicle towed due to disabling damage.

*A MCMIS-reportable crash will meet at least one vehicle threshold and one crash threshold.

FINDINGS

This study estimated a significant amount of underreporting to the MCMIS crash file by the States, for the carriers who cooperated in the study. For the study carriers, it appears that the MCMIS file contained about 66 percent of their reportable crashes.

Several sources of underreporting were identified. Arranging them in the chronological order of the crash reporting process (from crash event to State crash file to the MCMIS crash file), highlights the vulnerabilities in the reporting process.

1. About 56 percent of the missing crashes apparently had no police report filed. They were in the carriers' crash data but were not found in State crash data. If no crash report is filed, the case cannot appear in the MCMIS crash file.

2. Among the missing crashes that were reported to State crash files, several factors contributed to their either not being uploaded to or not being found in the MCMIS crash file:

   a) Of the "study carrier" crashes that couldn't be found in MCMIS by UMTRI, but could be found in State files, over half were cases that had either missing or incorrect DOT numbers.

   For the cases that had missing DOT numbers, UMTRI concluded that the officers filling out the Police Accident Reports believed that the crash was not reportable.

   For the cases that had incorrect DOT numbers, they were uploaded to MCMIS, but UMTRI couldn't identify them due to the incorrect numbers.

   b) About 24 percent of the records missed were medium- and heavy-duty trucks that were misclassified as light vehicles.

   c) MCMIS-reportable crashes involving only trucks with in-State plates were less likely to be reported by States to MCMIS.

   d) In about half of the MCMIS-reportable cases in State files that were not reported, the crash severity, as coded, met the MCMIS severity threshold and the vehicles met the MCMIS vehicle criteria. This points to problems within States for identifying crashes in their data meeting the MCMIS reporting criteria.

RECOMMENDATIONS

This study uncovered no single error or source of mistakes that was the key to major improvement. Data collection is unavoidably tedious. However, steps can be taken to increase the completeness of reporting and improve the accuracy and usefulness of the data.

UMTRI offered the following suggestions to address various aspects of the MCMIS crash underreporting problem. Depending on how the different problems are valued, different suggestions could be adopted.

- Simplify the MCMIS crash reporting criteria.
- Consider raising the crash severity threshold for reporting crashes to MCMIS.
- Encourage all States to collect the same crash data for all vehicles.
- Automate data collection as much as possible.
- Use data linkages as much as possible to bring in data from other sources and reduce the burden on officers who complete crash reports.
- Encourage all states to adopt the Model Minimum Uniform Crash Criteria (MMUCC), which now almost always contains the necessary data to identify MCMIS-reportable crashes.
- Develop a standardized computer algorithm to extract the State crash data and upload it to MCMIS.

To read the complete report, please visit: [insert link to published report once available]