



**U.S. Department of  
Transportation**

Office of the Secretary  
of Transportation

The Inspector General

Office of Inspector General  
Washington, D.C. 20590

June 19, 2007

The Honorable Thomas E. Petri  
Ranking Member, Subcommittee on Aviation  
Committee on Transportation and Infrastructure  
House of Representatives  
Washington, DC 20515

Dear Representative Petri:

Thank you for your letter of April 7, 2006, regarding improvements in the quality of the underlying data of the Motor Carrier Safety Status Measurement System (SafeStat), and your concern that the data may continue to contain flaws. We received your request shortly after the Federal Motor Carrier Safety Administration (FMCSA) briefed your staff on the plans for returning to public access the overall SafeStat scores and Accident Safety Evaluation Area<sup>1</sup> assessments.

Based on your request, we reviewed FMCSA's efforts to improve the data relied upon in SafeStat. We found that, although improvements have been made, problems still exist with the reporting of crash data. Crash data is reported by the states to FMCSA's central database and becomes part of the SafeStat scores, including a ranking designed specifically to reflect a motor carrier's crash history. The effectiveness of the SafeStat scoring and ranking calculations is highly dependent on the quality of the crash data file, which in the past was missing a substantial number of reportable crashes.

As stated in its briefing, FMCSA has claimed significant improvements in the crash file, including stating that 2004 non-fatal crashes in its database represented 99 percent of the National Highway Traffic Safety Administration's estimated number of non-fatal large truck crashes. We agree that states are reporting more crashes to the SafeStat database, but we found anomalies that caused us to question the completeness of *non-fatal* crash reporting. During our review, FMCSA acknowledged the need to develop a new, more reliable estimate and has begun work to implement the estimate. In our view, this estimate should allow FMCSA to

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<sup>1</sup> SafeStat overall scores are based on four assessment areas for which percentile rankings are calculated using current on-road safety performance information and on-site compliance review and enforcement history information. The Accident Safety Evaluation Area uses crash data to rank a motor carrier's crash experience relative to its peers.

evaluate, both nationally and state-by-state, completeness of non-fatal crash reporting before the Department makes all SafeStat scores available to the public. FMCSA expects to have this estimate in place by October 2007.

A more accurate account of non-fatal crash reporting is needed because crash data are a large component of the SafeStat calculation of a motor carrier's relative safety ranking, and non-fatal crashes comprise over 96 percent of crashes reported to FMCSA. Completeness of data is critical for SafeStat because scoring involves a relative safety ranking of one carrier against other carriers competing for the same business. Missing crash reports may place a lower risk carrier in a deficient category because data for a higher risk carrier is not included in the calculation. Consequently, FMCSA should continue to limit public use until it can assess whether significant crash reporting problems remain.

Although we believe FMCSA should limit public use of SafeStat for now, we recognize that crash data will never be perfect. But the decision to allow public use of SafeStat rankings should include consideration of the potential benefit to public safety. In a March 22, 2004, statement to the National Industrial Transportation League, former FMCSA Administrator Annette Sandberg said, "SafeStat is a vitally important tool that allows you [shippers] to examine the performance trends of your [its] existing and prospective carriers." In this regard, public use of SafeStat represents an opportunity to positively impact motor carrier safety.

On May 7, 2007, we briefed your staff on the results of our review (copy of briefing enclosed). Our briefing focused on your specific concerns and the results are summarized below.

### **Improvement in SafeStat Data Quality is Still Needed**

Our review found that FMCSA has made improvements in the data relied upon in SafeStat, but problems with the completeness of crash reporting still exist. In our February 2004 audit report, we reported that an estimated one-third of crash reports, including 37,000 crashes involving interstate carriers, were missing from FMCSA's database. More recently, the University of Michigan Transportation Research Institute (the Institute) completed 14 individual state data quality evaluations. These evaluations found problems with the completeness of state crash reporting and identified problems with crash forms and a need for additional training for crash reporting officials. The Institute also identified problems with imprecise vehicle type and crash severity categories on state crash forms. This inconsistency caused confusion in the determination of whether a crash is reportable.

FMCSA's long-term goal is to work with the Institute to obtain an accurate account of reportable large truck crash events and document crash reporting problems for each of the 50 states by reviewing state crash records. In an effort to accomplish this goal, FMCSA plans to have the Institute complete 18 additional state evaluations in the current fiscal year, and anticipates completing the remaining state evaluations by the

end of fiscal year 2008. FMCSA has already used the results of completed state evaluations to prompt the correction of data entry forms, target training programs, and correct information technology issues.

### **State Safety Data Quality Map Does Not Reflect An Important Component**

FMCSA's State Safety Data Quality map is a useful indicator of data quality, but the map does not reflect non-fatal crash reporting in its state ratings. In spite of this, the map is valuable because it publicly discloses which states have problems with completeness of crash reporting; crash and inspection timeliness; and, on a limited basis, crash and inspection accuracy. However, the rating used to determine how completely a state reports crashes to FMCSA uses only *fatal* crash data. Using only fatal crash data in the map is a substantial omission in the measurement of crash reporting completeness because *non-fatal* crashes comprise over 96 percent of crash reports in FMCSA's database. As evidenced in the Institute's evaluations of state crash reporting, states were found to have the most trouble with non-fatal crash reporting criteria. Consequently, FMCSA is working with the Institute to develop a non-fatal crash estimate and to incorporate a non-fatal crash completeness measure into the State Safety Data Quality map. FMCSA expects to fully implement the improved map in October 2007. In our opinion, FMCSA should complete this step before making SafeStat scores available to the public.

### **Quality Standards are Good, but Measuring Achievement of Standards is a Problem**

FMCSA assesses the reliability of data using four standards: (1) completeness of non-fatal crash reporting, (2) lack of geographic variation in crash reporting, (3) requirement for states to receive passing scores on the State Safety Data Quality map, and (4) implementation of the DataQs system, an electronic means for filing concerns about Federal and state data released to the public by FMCSA. FMCSA's standards for assessing reliable data are good, but problems with measuring the completeness of crash reporting make it hard to determine whether three of the four standards have been met.

FMCSA previously determined that the first standard that had been met because the 2004 crash file was 99 percent of the National Highway Traffic Safety Administration's estimate. We found this determination to be questionable because nine states are reporting only 60 percent of crashes determined to be reportable by the Institute. This difference is significant because those same states reported 38 percent of state crashes to FMCSA in 2004. Further, because the total number of reportable truck crashes is based on a National Highway Transportation Safety Administration estimate that has a margin of error of plus and minus 15 percent, even the 99-percent measure could fall below the 90-percent standard. Assessments made on the second and third standards are also questionable until FMCSA can determine the completeness of non-fatal crashes of individual states.

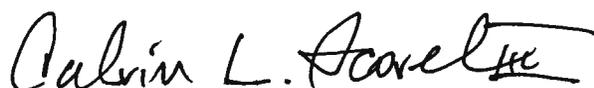
For the fourth standard, we verified that FMCSA successfully implemented the DataQs as an administrative mechanism to correct data provided by states. This system is important to the integrity of the data because it allows motor carriers and the states to challenge any data they deem questionable. DataQs facilitates the process by providing access and visibility for more than 17,000 challenges to FMCSA field offices and state enforcement agencies that maintain the original crash and inspection reports. Our checks of the DataQs system included a review of records and observation of the system in operation. Using a random sample of DataQs challenges, we verified that the appropriate corrective actions were made to SafeStat data in cases where FMCSA or state officials agree the challenge warranted corrective action.

### **Conclusion**

Before FMCSA allows public access to SafeStat scores, it must improve its ability to measure the completeness of non-fatal crash reporting. Presently, FMCSA is testing and refining the first version of a new, more accurate national estimate for how many non-fatal crash reports are missing from its database and how many are missing from each state. This estimate should substantially improve the State Safety Data Quality map as an indicator of crash completeness and make FMCSA's assessments against data quality standards more credible in allowing public access to SafeStat scores. FMCSA plans to have the measure in place by October 2007. Consequently, it should complete this step before making SafeStat scores available to the public.

If you have any questions concerning our review, please contact me at (202) 366-1959 or my Deputy, Todd Zinser, at (202) 366-6767.

Sincerely,



Calvin L. Scovel III  
Inspector General

Enclosure



# U.S. Department of Transportation

Office of Inspector General Briefing in  
Response to Representative Petri's Request  
Regarding SafeStat Data Quality

May 7, 2007

## Correspondence History

- March 13, 2006 – American Trucking Associations (ATA) letter to the Secretary voiced strong opposition to reestablishing full public access to SafeStat crash related and overall scores because of their serious and continuing concerns about the SafeStat system. ATA is concerned that the public use of SafeStat information directly impacts a motor carrier's business environment and opportunities.
- April 7, 2006 – Representative Thomas Petri (R-WI), then Chairman, Subcommittee on Highways, Transit and Pipelines, House Committee on Transportation and Infrastructure sent a letter to the OIG requesting answers to questions in these areas.
- The Secretary responded to the ATA in a June 12, 2006 letter stating that FMCSA will delay the decision to re-post SafeStat results until ongoing reviews are completed. In addition to our work, other ongoing reviews, aside from FMCSA's work, include two GAO audits--(1) "Identifying High Risk Motor Carriers," started in May 2006 and (2) "Motor Carrier Safety Oversight" started in February 2006. The first is scheduled to be completed in June 2007, and the second is scheduled to be completed in September 2007.

## Objectives and Methodology

Our **objectives** were to respond to several questions posed in Representative Petri's letter covering the following three issues:

- Data Quality Improvements – evaluate the Federal Motor Carrier Safety Administration's (FMCSA) efforts to improve the quality of data in the Motor Carrier Safety Status Measurement System (SafeStat)
- State Safety Data Quality (SSDQ) Map – is it an accurate indicator?
- Data Quality Standards – evaluate FMCSA's standards for reliable and complete data

Our **methodology** for responding to questions involved the following actions:

- Reviewed documentation, reports, and data files provided by FMCSA, National Highway Traffic Safety Administration (NHTSA), and the University of Michigan Transportation Research Institute (UMTRI)
- Coordinated with General Accountability Office (GAO) officials conducting two related ongoing reviews
- Observed an FMCSA data quality workshop on measures development on June 13, 2006
- Interviewed officials from FMCSA, NHTSA, and UMTRI
- Our **limitations** – Did not develop independent assessments of Motor Carrier Management Information System (MCMIS) crash completeness or reproduce evaluations of state crash reporting completed by UMTRI.

## Summary

- **Data Quality Improvements.** FMCSA has made improvements to the data SafeStat relies upon but should follow through on its plans to complete state data quality evaluations for all 50 states by the end of fiscal year 2008 and implement its program to identify and fine motor carriers that have violated the regulation for timely submission of census data updates.
- **SSDQ Map.** Although FMCSA's SSDQ map does not measure non-fatal crash completeness, it is still a useful tool for surfacing data quality issues. FMCSA and UMTRI are implementing a non-fatal crash completeness measure and are presently working to incorporate it into the map.
- **Data Quality Standards.** FMCSA's four standards for reliable data are good, but problems with measuring the completeness of crash reporting make it hard to determine whether three of the four standards have been met. FMCSA has recognized this weakness and has initiated efforts to implement new data quality measures and re-evaluate the SafeStat related data quality standards. These efforts are scheduled for completion in October 2007. A fourth standard, implementation of the DataQs\* system, passed our assessment.

\* The DataQs system is an electronic means for filing concerns about Federal and state data released to the public by FMCSA.

## FMCSA Efforts to Improve SafeStat Data Quality

▪ **What efforts has FMCSA made and to what extent have these efforts resulted in improvements in data relied upon by SafeStat?**

- Motor carriers submitted more required updates to the census file and included more driver and power unit (vehicle) data, as evidenced by the decrease in outdated data and the number of driver and power unit data fields populated with zeros.

| Motor Carriers With: | January 2003 | January 2005 |
|----------------------|--------------|--------------|
| Outdated Data        | 42%          | 27%          |
| "Zero" Drivers       | 15%          | 11%          |
| "Zero" Power Units   | 11%          | 8%           |

Source: MCMIS as of January 31, 2003 and January 31, 2005.

- Timeliness and accuracy of crash and inspection data have improved, and the quantity of non-fatal crash reports included in MCMIS has increased, although crash data accuracy showed the least amount of improvement.

| Timeliness (T) and Accuracy (A) Metric               | FY 2002  | FY 2004 | % Change |
|--|----------|---------|----------|
| Average Time to Enter and Upload Crash Data (T)      | 158 days | 92 days | 42%      |
| Average Time to Enter and Upload Inspection Data (T) | 37 days  | 18 days | 51%      |
| Non-Match Crash Data (A)                             | 15.6%    | 14.2%   | 9%       |
| Non-Match Inspection Data (A)                        | 5.8%     | 3.3%    | 43%      |

Source: FMCSA data for FY 2002 as of April 2004 and FY 2004 as of March 2006.

Note: The purpose of the table above is to show whether progress was made by using equivalent data snapshots 18 months after the end of the fiscal year for fiscal year (FY) 2002 and FY 2004. We allowed extra time after the end of the fiscal year to take data snapshots to give us more assurance that all reporting backlogs will be entered into MCMIS.



## Accuracy of FMCSA's SSDQ Map

▪ **Is the agency's Safety Data Quality Map an accurate indicator of a state's data quality?**

No, because:

- FMCSA's SSDQ map is useful as an indicator; however, a state could have a good rating on the map, but at the same time have problems with non-fatal crash completeness.
  - The SSDQ map does not have a non-fatal crash completeness measure. Therefore, overall crash completeness, as a component of the map, does not reflect over 96 percent of all reportable crashes.
  - Michigan, Illinois, and Missouri received a good rating on the map, although UMTRI reports indicated problems with crash completeness. The SSDQ map results will not be comparable to UMTRI evaluations until FMCSA incorporates a measure for completeness of state non-fatal crash reporting into the map.
- **FMCSA is working with UMTRI to develop a more accurate national estimate for non-fatal crash completeness with a statistically valid way to estimate each state's share. This will substantially improve the SSDQ map as an indicator of crash completeness. FMCSA expects the measure to be ready for view by state officials in July 2007 and the new map made available to the public by October 2007.**

## FMCSA's Data Quality Standards for Reliable and Complete Data

- ***What more needs to be done, if anything, to ensure data quality meets the DOT's data quality guidelines?***

**FMCSA needs a better estimate of non-fatal reportable crashes.** We question FMCSA's assessment that states are reporting 99 percent of reportable non-fatal crash records to MCMIS. To ensure it meets data quality standards, FMCSA should

- improve its ability to measure non-fatal crash completeness.
- complete its development of a new measure that is based on a more accurate national estimate for non-fatal crash completeness with a statistically valid way to estimate each state's share.

FMCSA has agreed to implement new data quality measures and re-evaluate the SafeStat related data quality standards by October 2007.

## FMCSA's Data Quality Standards for Reliable and Complete Data (cont.)

**We question FMCSA's assessment that states are reporting 99 percent of reportable non-fatal crash records to MCMIS. Specifically:**

- FMCSA does not address the impact of the NHTSA General Estimate System (GES) +/-15 percent relative margin of error for non-fatal large truck crash involvements that FMCSA uses as its benchmark.
- The magnitude of UMTRI identified non-fatal crash underreporting has not been addressed. Therefore, reporting continues to be significantly incomplete in nine states with UMTRI evaluations.
  - The MCMIS file of non-fatal large truck crash records contained only 60 percent of the crashes determined to be reportable by UMTRI.
  - Although the nine UMTRI states were not representative of all states, they represent 38 percent of state reported crash records in MCMIS for 2004.
- The crash completeness measure in FMCSA's SSDQ map is not a good standard of data quality because the GES estimate cannot be used as a benchmark for individual state non-fatal crash reporting.

## FMCSA's Data Quality Standards for Reliable and Complete Data (cont.)

- *What is the standard for reliable and complete data in the SafeStat system?*

### **FMCSA's Standards for Reliable Data**

1. SafeStat Data Quality Rating of PASS for two consecutive quarters
2. MCMIS non-fatal crash reporting at 90 percent of General Estimates System (GES) within 6 months of calendar year
3. No regional clustering of states with over 60 percent of crash records underreported
4. Implement the DataQs system

## FMCSA's Data Quality Standards for Reliable and Complete Data (cont.)

We assessed FMCSA standards for reliable and complete data.

| FMCSA's Standards for Reliable Data   | Is the standard useful? | Is the standard impacted by crash measure issue? | Has the standard been met? |
|---|-------------------------|--|----------------------------|
| 1. SafeStat Data Quality Rating of PASS for two consecutive quarters  | Yes                     | Yes  | Unknown*                   |
| 2. MCMIS non-fatal crash reporting at 90 percent of General Estimates System (GES) within 6 months of calendar year | Yes                     | Yes  | Unknown*                   |
| 3. No regional clustering of states with over 60 percent of crash records underreported                             | Yes                     | Yes  | Unknown*                   |
| 4. Implement the DataQs system  | Yes                     | No   | Yes                        |

\*Because of weaknesses in FMCSA's ability to measure non-fatal crash completeness, we were unable to determine whether the standard was met. Before the question can be answered, FMCSA must address the problems with the non-fatal crash measure.

## FMCSA's Data Quality Standards for Reliable and Complete Data (cont.)

- ***Is this standard a good indication of reliable data? If not, what recommendations would the Office of Inspector General suggest as to the proper standard or standards?***
  - Yes. FMCSA's standard for reliable data is good. However, FMCSA should not use the GES non-fatal crash estimate as the benchmark for its standard for non-fatal crash completeness. FMCSA has already agreed to implement a new measure for its standard.
- ***Even when SafeStat meets the Department's data quality standards, should there be a review period before new data are publicly posted to give carriers and the states the opportunity to review and correct any incorrect data?***
  - Because FMCSA already has processes in place to receive comments and correct data problems, we did not conclude that a public review period would provide significant additional benefit.
  - Motor carriers and the states are given the opportunity to correct data using the DataQs system.

The following pages contain textual versions of the graphs and charts found in this document. These pages were not in the original document but have been added here to accommodate assistive technology.

## FMCSA's State Safety Data Quality Map

Updated Results: March 23, 2007

| State                | State Rating |
|----------------------|--------------|
| Alabama              | Good         |
| Alaska               | Fair         |
| Arizona              | Good         |
| Arkansas             | Good         |
| California           | Good         |
| Colorado             | Good         |
| Connecticut          | Good         |
| Delaware             | Good         |
| District of Columbia | Good         |
| Florida              | Good         |
| Georgia              | Good         |
| Hawaii               | Good         |
| Idaho                | Good         |
| Illinois             | Fair         |
| Indiana              | Fair         |
| Iowa                 | Good         |
| Kansas               | Good         |
| Kentucky             | Good         |
| Louisiana            | Good         |
| Maine                | Good         |
| Maryland             | Fair         |
| Massachusetts        | Poor         |
| Michigan             | Good         |
| Minnesota            | Good         |
| Mississippi          | Good         |
| Missouri             | Good         |
| Montana              | Good         |
| Nebraska             | Good         |
| Nevada               | Good         |
| New Hampshire        | Poor         |
| New Jersey           | Poor         |
| New Mexico           | Fair         |
| New York             | Good         |
| North Carolina       | Fair         |
| North Dakota         | Good         |
| Ohio                 | Good         |
| Oklahoma             | Good         |
| Oregon               | Good         |
| Pennsylvania         | Good         |
| Rhode Island         | Good         |
| South Carolina       | Good         |
| South Dakota         | Good         |

## FMCSA's State Safety Data Quality Map

Updated Results: March 23, 2007

|               |      |
|---------------|------|
| Tennessee     | Good |
| Texas         | Good |
| Utah          | Good |
| Vermont       | Good |
| Virginia      | Fair |
| Washington    | Good |
| West Virginia | Fair |
| Wisconsin     | Good |
| Wyoming       | Good |

The map ratings are the result of an evaluation of state-reported crash and roadside inspection data to FMCSA. Roadside inspection data are evaluated for timeliness and accuracy. Crash data are evaluated for completeness, timeliness, accuracy and consistency. However, for crash completeness, **the map excludes non-fatal crashes.**