



MARCH 16, 2012

# Review of Wells Fargo Equity Research Report on Compliance, Safety, Accountability

## Executive Summary

In December 2010, the U.S. Department of Transportation's Federal Motor Carrier Safety Administration (FMCSA) implemented a new motor carrier Safety Measurement System (SMS) as part of the Compliance, Safety, Accountability (CSA) initiative. The SMS assesses motor carrier performance and compliance history in seven Behavior Analysis and Safety Improvement Categories (BASICS): Unsafe Driving, Fatigued Driving (Hours-of-Service (HOS)), Driver Fitness, Controlled Substances and Alcohol, Vehicle Maintenance, Cargo-Related, and Crash Indicator. It is designed to identify motor carriers with safety compliance and/or performance problems for intervention by FMCSA and its State Partners.

In November 2011, Wells Fargo Equity Research issued a report, titled "CSA: Good Intentions, Unclear Outcomes." The Wells Fargo report claimed there was no meaningful statistical relationship between the results in the Unsafe Driving and Fatigued Driving (HOS) BASICS and crash frequency based on a sample of 200 of the largest motor carriers in the FMCSA census database of motor carriers.

FMCSA strongly disagrees with the findings of the Wells Fargo report. In contrast to the Wells Fargo analysis, FMCSA and the University of Michigan Transportation Research Institute (UMTRI), an independent evaluator, found robust statistical relationships between the Unsafe Driving and Fatigued Driving (HOS) BASICS and crash risk, using a large sample. These relationships apply for all motor carriers as well as a subset of the largest motor carriers.

This document delineates the detailed results of FMCSA's and UMTRI's more comprehensive analyses and responds directly to the specific findings of the Wells Fargo report.

### **Primary Finding of Wells Fargo Analysis:**

**Based on a sample of 200 of the largest motor carriers, Wells Fargo did not find a statistically meaningful relationship between the Unsafe Driving/Fatigued Driving (HOS) BASICS and crash rates.**

FMCSA disagrees with this assertion based on the results of its own analysis and an independent evaluation of the CSA program by UMTRI.

In contrast to the Wells Fargo analysis, the Volpe National Transportation Systems Center conducted a more comprehensive study for FMCSA that showed significant statistical relationships between the Unsafe Driving and Fatigued Driving (HOS) BASICS and crash risk for all carriers, as well as a subset of the largest carriers. The Volpe study used a much larger sample to determine this association – 29,000 carriers and 42,000 respectively for the Unsafe Driving and Fatigued Driving (HOS) BASICS.

UMTRI also independently evaluated SMS prior to the national rollout in December 2010 using a comprehensive sample. The analysis by UMTRI found that carriers identified by SMS with percentiles above the FMCSA's intervention thresholds in the Unsafe Driving BASIC or Fatigued Driving (HOS) BASIC (i.e., poor performers) had crash rates of 7.44 and 6.24 crashes per 100 Power Units (PUs), respectively. These crash rates far exceed the 2.09 average crashes per 100 PU for motor carriers that did not exceed FMCSA's intervention threshold in any BASIC.

The appendix to this document provides specific details showing the relationship between the Unsafe Driving and Fatigued Driving (HOS) BASICS and crash risk as determined by both the Volpe National Transportation Systems

Center and UMTRI. The relationship is clear – carriers of all sizes with percentiles above the intervention thresholds in the Unsafe Driving and Fatigued Driving BASICS have higher crash rates than other carriers.

**Factors Identified by Wells Fargo as Contributing to their Primary Finding:**

- 1) Increased scrutiny (i.e., inspections) often leads to an increase in violations. Therefore, it is hard for carriers to improve once they “breach” a BASIC threshold.**

This statement is incorrect. FMCSA has seen evidence that when carriers have opportunities to improve, they often do so. In fact, the SMS and BASIC results are intended to inform motor carriers and drivers of the need to improve safety management systems and performance. The FMCSA acknowledges that carriers with high violation rates are, and should be, subjected to increased scrutiny. Carriers with high BASIC percentiles undergo more frequent inspections due to systems like the Inspection Selection System (ISS), which prioritizes inspections of carriers with prior evidence of noncompliance. Focusing law enforcement resources such as roadside inspections on the carriers with poor safety performance helps mitigate crash risk and encourages such carriers to improve their safety.

In all BASICS, except Unsafe Driving and Crash Indicator, the measures are calculated as violations *per inspection*. Therefore, each inspection with no BASIC violations will improve the carrier’s measure. Carriers with high percentiles tend to be inspected more frequently, and thus have more opportunities to demonstrate improved compliance. FMCSA’s State partners conduct approximately 3.5 million inspections each year, and approximately one-third of these find no violations.

UMTRI’s CSA evaluation also demonstrated carriers’ ability to improve their SMS results. According to the UMTRI evaluation, 83 percent of motor carriers that received a warning letter substantially improved their SMS-identified safety problems within twelve months.

- 2) A “negative feedback loop” may have been created for carriers with unfavorable BASICS. In particular, the Wells Fargo analysis highlighted a high correlation between Unsafe Driving BASIC percentiles and inspection frequency.**

The Wells Fargo report does not clearly indicate how or why Wells Fargo believes that a “negative feedback loop” contributes to a discrepancy in the correlation between BASIC results and crash risk. The Unsafe Driving BASIC reflects motor carrier performance in areas such as speeding, following too closely, and improper lane changes. These types of moving violations are not discovered during an inspection, but rather, are the very reason the inspection was conducted in the first place. Therefore, it is expected that motor carriers with high Unsafe Driving BASICS would have a higher inspection frequency per mile or per vehicle.

### **3) Violation severity weights may not accurately capture driving behaviors that lead to crashes.**

Violation severity weights are designed to assist SMS in differentiating between the varying degrees of crash risk associated with specific violations. They are only one factor that goes into calculating the BASIC percentiles. The SMS is designed to identify patterns of poor performance across multiple inspections. The weightings also factor in the potential for increased consequences from crashes such as those involving hazardous materials (HM) or driver safety belt infractions. Regardless of the severity weights assigned to a particular violation in a particular inspection, motor carriers with systemic safety problems across multiple inspections tend to have higher BASIC percentiles in the SMS. Severity weight alone is not a major factor in identifying motor carriers with systemic safety problems.

FMCSA recognizes that the current violation severity weights have been the subject of considerable comment and concern. FMCSA continues to consider and implement improvements that will address these and other valid concerns. For example, later this year, information system enhancements will enable the SMS to differentiate between “safety-based” and “non-safety based” (i.e., failure to pay child support) suspended driver’s license violations. Based on continuing analysis and feedback from various stakeholders, FMCSA is considering simplifying the use of severity weights by moving towards a simplified “high, medium, low” violation severity scale to replace the current 10-point scale.

### **4) Enforcement procedures vary significantly across States and jurisdictions with disparities between the frequency of inspections and inspection protocols.**

FMCSA is continually working with the Commercial Vehicle Safety Alliance to develop a consistent program of enforcement across the States. Some States have different focus areas than others. These variations in no way impact the effectiveness of the SMS to identify carriers that have poor compliance histories. The key to improved SMS results is compliance with all applicable laws and regulations. A compliant carrier will have good SMS results regardless of the State in which it operates or the number of inspections performed on its vehicles.

### **5) None of the BASICs account for wide variability in the number of inspections per Power Unit (PU) or per Vehicle Miles Traveled (VMT).**

Whether due to compliance, business model, or area of operation, some carriers receive more frequent inspections. This is moderated in the SMS methodology by measuring carrier compliance in all of the BASICs (other than Unsafe Driving and Crash Indicator) on a *per inspection* basis. Therefore, variability in inspections per PU or per VMT is not problematic.

### **6) Carriers are given SMS results that may not adequately distinguish between the nature of their operations.**

There are a wide variety of motor carriers that differ in a number of ways (i.e., size, operation type, vehicle types, where they drive). FMCSA’s goal is to identify unsafe behavior and prioritize the safety of operations over the differences in a carrier’s operations. If there is demonstrable data showing that a BASIC is biased against an industry segment or operation type, FMCSA makes improvements to the system. For example, FMCSA incorporated VMT into the SMS and divided carriers into “combination” and “straight-truck” categories to better acknowledge differences in on-road exposure of carriers when calculating the Unsafe Driving and Crash Indicator BASICs. It is the motor carrier’s responsibility to operate in compliance with applicable laws and regulations, which may differ with type of operation.

FMCSA continually evaluates the effectiveness of the SMS, and reviews comments from stakeholders to identify and prioritize improvements to the SMS. For example, an upcoming change to the SMS will create a new HM BASIC, and address concerns relating to the identification of flat bed carriers for intervention. These changes were initiated to better identify carriers for interventions while taking into account the nature of their operation.

**7) Only 12 percent of carriers have sufficient inspection data to be rated in a BASIC. The Wells Fargo report expresses concern that this will cause unsafe drivers to move to smaller carriers in order to avoid oversight and will result in large carriers bearing the greatest cost of compliance and regulation.**

This concern is unfounded. FMCSA believes that the Wells Fargo assertion that “only 12 percent of carriers have sufficient inspection data to be rated” relates to the approximately 92,000 motor carriers that have sufficient negative information (i.e. violations or crashes) for the SMS to assign a percentile to a BASIC. This number is 12% of the total number of carriers listed as active. FMCSA’s analysis shows the following:

- Of the 750,000 carriers listed as active, only about 525,000 have had *any activity in the last three years*
- Approximately 200,000 motor carriers have sufficient crash or inspection activity to be assessed in at least one BASIC of the SMS. This group of 200,000 carriers *includes carriers of all sizes*, and they are involved in *over 90 percent* of all crashes attributed to interstate carriers and intrastate HM carriers.
- **12% of the carriers listed as active (approximately 92,000) have enough negative information to be assessed in at least one BASIC, and those carriers are responsible for 83% of the crashes.**

The data are summarized in the table below and clearly show that the SMS is assessing a large segment of the active motor carrier population and that those motor carriers being assessed have the highest potential for future crashes

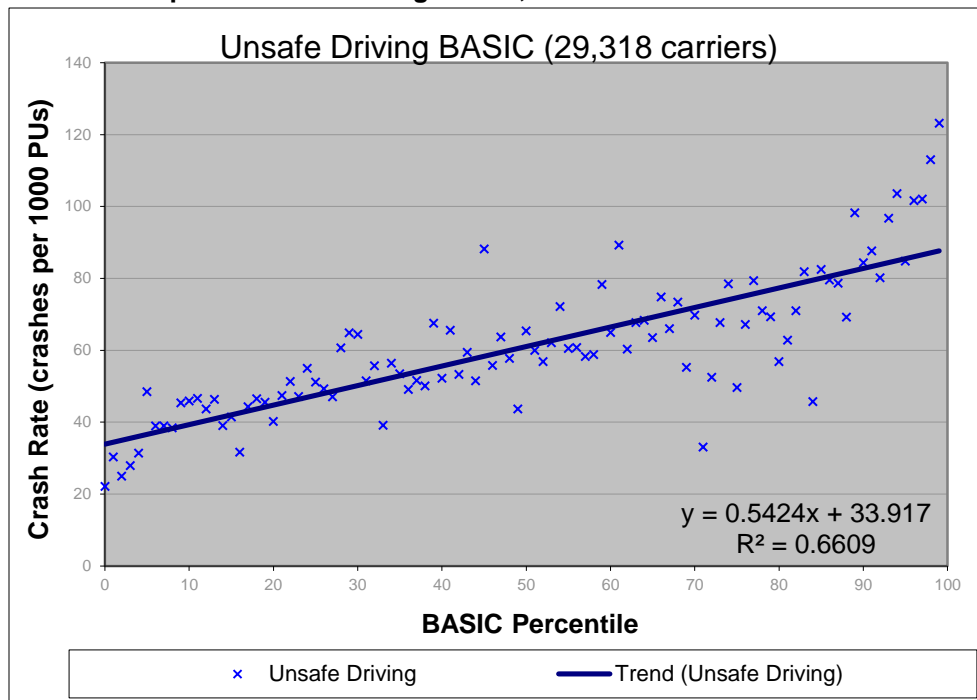
Carrier Category	Approximate Number of Carriers (March 2011)	Percentage of Uploaded Crashes
Carriers Listed as Active	750K	100%
Carriers with Recent Activity “Pulse” in last 3 years	525K	100%
Carriers with Insufficient Data	325K	8%
Carriers with Sufficient Data to Be Assessed in at Least 1 BASIC	200K	92%
Carriers with Sufficient Negative Information to Have a Percentile Assigned	92K	83%
Carriers with At Least 1 BASIC above FMCSA Intervention Threshold	50K	45%

## Appendix

### Relationship between Unsafe Driving/Fatigued Driving (HOS) BASICs and Crash Risk

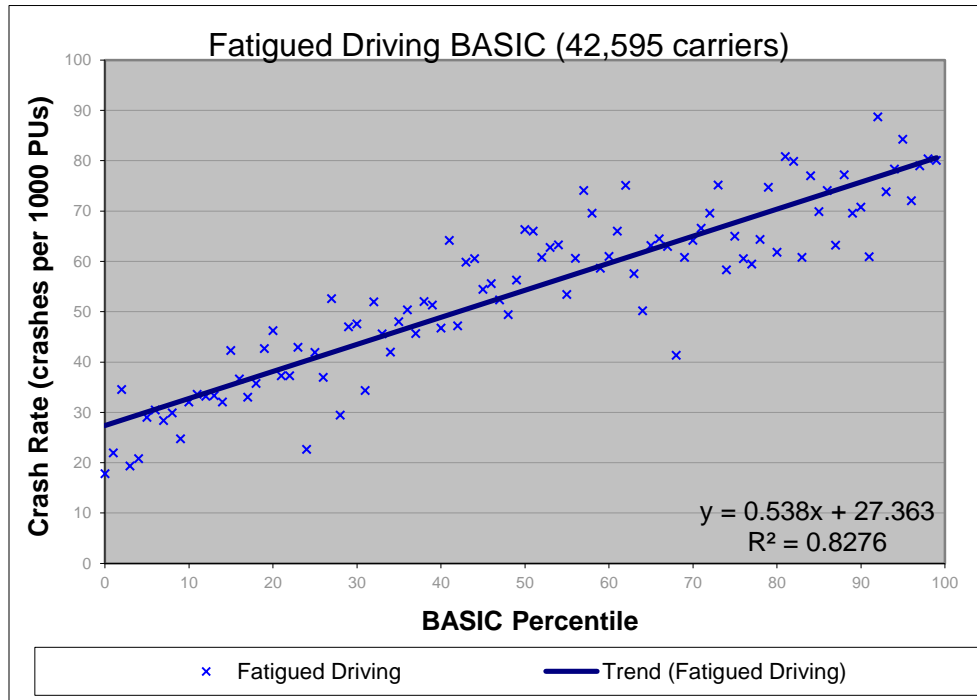
Prior to national rollout of SMS in December 2010, the Agency conducted analysis through the Volpe National Transportation Systems Center (Volpe Center), which assessed the strength of the Unsafe Driving/Fatigued Driving (HOS) BASICs. This analysis measured how well each BASIC identified carriers that pose a high future crash risk. Using over 29,000 carriers with sufficient data to receive a percentile in the Unsafe Driving BASIC and over 42,000 carriers with a percentile in the Fatigued Driving (HOS) BASIC, the Volpe Center analysis showed a statistically strong positive relationship between carriers with high BASIC percentiles and high subsequent crash rates. Data on these relationships for the Unsafe Driving BASIC and Fatigued Driving (HOS) BASIC are presented in Graph 1 and Graph 2, respectively. More information on how this analysis was conducted can be found in the Volpe Center paper “Carrier Safety Measurement System (CSMS) Violation Severity Weights.”<sup>1</sup>

**Graph 1: Unsafe Driving BASIC, All Carriers with Percentile**



<sup>1</sup> Link to Volpe Center Report “Carrier Safety Measurement System (CSMS) Violation Severity Weights”  
<http://www.regulations.gov/#!documentDetail;D=FMCSA-2004-18898-0161>.

**Graph 2: Fatigued Driving (HOS) BASIC, All Carriers with Percentile**

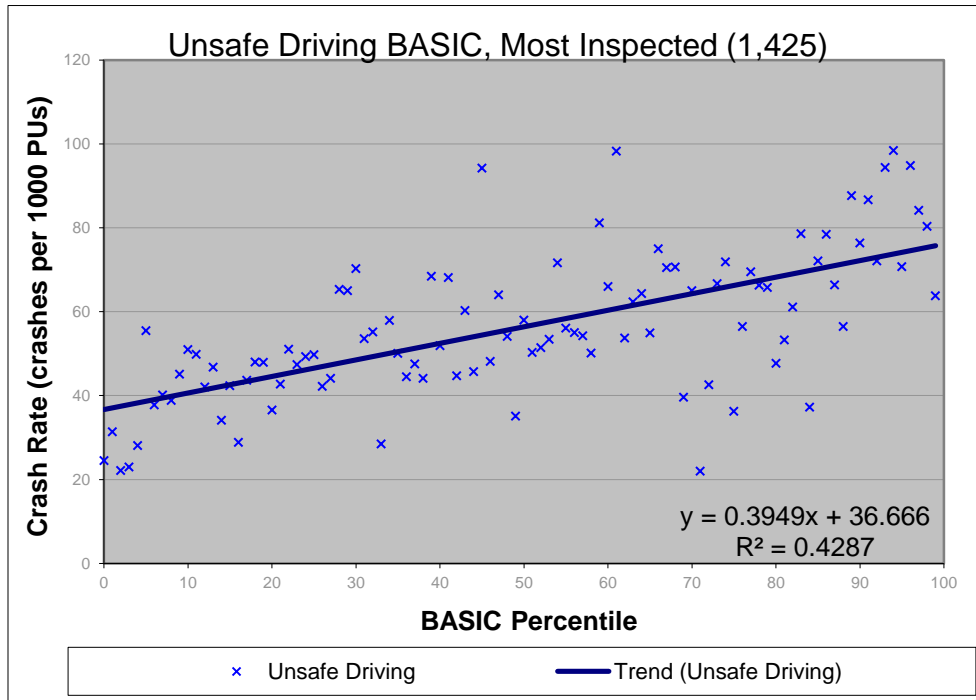


Each 'x' in the graphs represents the collective crash rate (crashes per 1,000 PUs) of all carriers with BASIC results close to that percentile. For example, the leftmost 'x' in Graph 2 represents the crash rate (19 crashes per 1,000 PUs) of all carriers who had a percentile at or above 0 and below 1. The second 'x' represents the crash rate of those between, at, or above 1 and below 2, etc. For both BASICs, the trend-lines are representative of the dataset ( $R^2$  values above 0.65 and 0.8, respectively), and show strong positive relationships with future crashes. In other words, carriers with high Unsafe Driving or Fatigued Driving (HOS) BASIC percentiles tend to represent a significantly greater future crash risk.

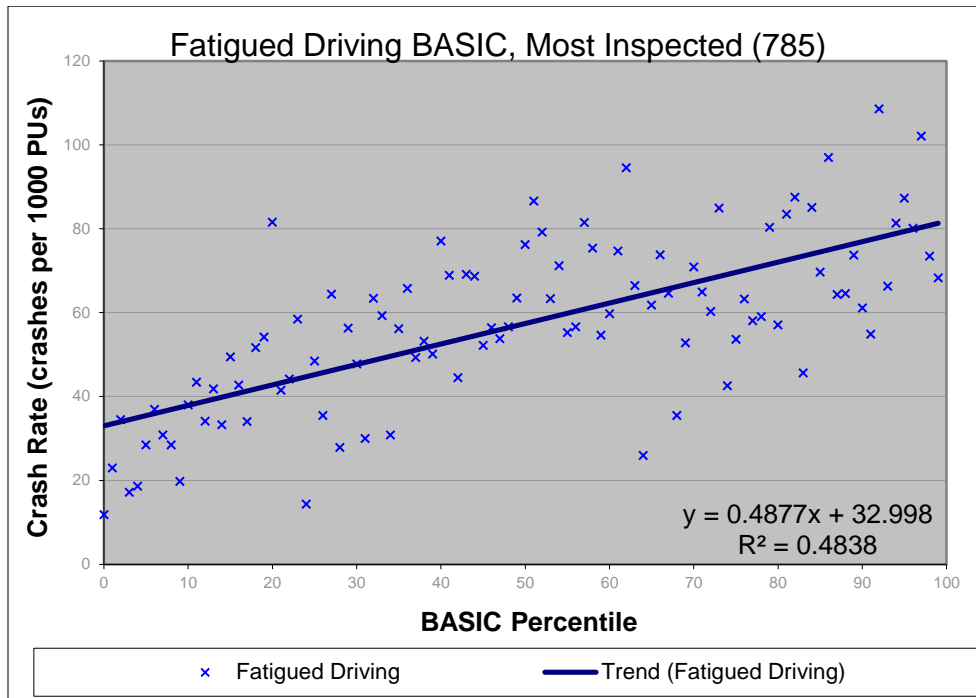
**The Most Inspected Carrier Population**

FMCSA conducted a similar analysis for the population of carriers with the greatest numbers of inspections. To capture sufficient data, this analysis assessed carriers in the two largest safety event groups in the Unsafe Driving BASIC (1,425 carriers), and the largest safety event group in the Fatigued Driving (HOS) BASIC (785 carriers). The results of this analysis are presented in Graph 3 and Graph 4. These carriers with the largest exposure to traffic enforcement and the roadside inspection programs showed similar positive relationships between BASIC percentiles and future crash risk as was found for the entire carrier population (shown in Graphs 1 and 2).

**Graph 3: Unsafe Driving BASIC, Carriers with the Most Unsafe Driving Violations**



**Graph 4: Fatigued Driving (HOS) BASIC, Carriers with the Most Inspections**





### Relationship Found During Third-Party Evaluation

The University of Michigan Transportation Research Institute (UMTRI) performed an independent evaluation of the CSA Op-Model Test prior to the SMS national rollout in December 2010. As part of the test, UMTRI researchers examined the relationships between the SMS BASICS and crash involvement. UMTRI findings mirrored the results of the Volpe Center analysis that showed a strong positive relationship between high BASIC percentiles and high crash involvement for Unsafe Driving and Fatigued Driving (HOS) BASICS. (See section 5.7 “Association between BASIC Percentiles and Crash Rates” of UMTRI’s report, and Table 25<sup>2</sup>)

**SMS Crash Rates Calculated During the 18-Month Follow-up Period (February 2008 - July 2009), Based on SMS Classification February 2008 for Nonparticipating Carriers**

BASIC Intervention Threshold Exceeded	Carriers	Crashes	Power Units	Crash Rate per 100 PU	Ratio to Carriers Exceeding no BASICS
<b>Exceeded No BASICS</b>	<b>428,966</b>	<b>45,029</b>	<b>2,157,939</b>	<b>2.09</b>	<b>1.00</b>
Unsafe Driving	9,245	33,532	450,874	7.44	3.56
Fatigued Driving	17,959	15,525	248,862	6.24	2.99
Driver Fitness	3,981	11,539	379,009	3.04	1.46
Controlled Substance and Alcohol	1,013	6,860	104,799	6.55	3.14
Vehicle Maintenance	18,280	13,643	278,198	4.90	2.34
Improper Loading/Cargo Securement	9,409	16,747	421,670	3.97	1.90
Crash Indicator	5,077	33,946	463,766	7.32	3.51
Exceeded Any BASIC	44,881	63,452	1,284,475	4.94	2.37
All Carriers	473,847	108,481	3,442,414	3.15	1.51

<sup>2</sup> Link to UMTRI report “Evaluation of the CSA 2010 Operational Model Test” <http://csa.fmcsa.dot.gov/Documents/Evaluation-of-the-CSA-Op-Model-Test.pdf>