Safety Measurement System (SMS) Methodology:

Behavior Analysis and Safety Improvement Category (BASIC) Prioritization Status

Compliance ★ Safety ★ Accountability

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Federal Motor Carrier Safety Administration

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List of Abbreviations

ATRI	American Transportation Research Institute
BASIC	Behavior Analysis and Safety Improvement Category
CDL	Commercial Driver's License
CMV	Commercial Motor Vehicle
CPDP	Crash Preventability Determination Program
CRWG	Compliance Review Work Group
CSA	Compliance, Safety, Accountability
DIR	Driver Information Resource
DSMS	Driver Safety Measurement System
EOBR	Electronic Onboard Recorder
FAST Act	Fixing America's Surface Transportation Act
FMCSA	Federal Motor Carrier Safety Administration
FMCSRs	Federal Motor Carrier Safety Regulations
HM	Hazardous Materials
HMRs	Hazardous Materials Regulations
HMSP	Hazardous Materials Safety Permit
HOS	Hours-of-Service
IEP	Intermodal Equipment Provider
L&I	Licensing and Insurance
MCMIS	Motor Carrier Management Information System
MCSAP	Motor Carrier Safety Assistance Program
OOS	Out-of-Service
OP-Model Test	Operational Model Test
PPOB	Principal Place of Business
PU	Power Unit
RDR	Request for Data Review
SAFER	Safety and Fitness Electronic Records System

SafeStat	Motor Carrier Safety Status Measurement System
SI	Safety Investigator
SMS	Safety Measurement System
UMTRI	University of Michigan Transportation Research Institute
U.S. DOT	U.S. Department of Transportation
VMT	Vehicle Miles Travelled

1. Introduction

The Federal Motor Carrier Safety Administration's (FMCSA) core mission is to prevent crashes, injuries, and fatalities related to large trucks and buses on our Nation's roads. An important step in achieving the mission is to identify unsafe motor carriers and prioritize FMCSA enforcement resources on those that pose the greatest safety risk. The Safety Measurement System (SMS) is FMCSA's workload prioritization tool. FMCSA uses the SMS to identify carriers with potential safety problems for interventions[1] as part of the Agency's safety compliance and enforcement program called Compliance, Safety, Accountability (CSA).

The SMS is designed to incorporate the safety-based regulations related to motor carrier operations. The SMS assesses compliance and prioritizes carriers for interventions based on their on-road performance and investigation results. On-road performance includes data collected from roadside inspections and crash reports; investigation results include violations discovered within the previous 12 months.

The SMS assesses motor carrier on-road performance and compliance by organizing data into seven Behavior Analysis and Safety Improvement Categories (BASICs): Unsafe Driving, Crash Indicator, Hours-of-Service Compliance, Vehicle Maintenance, Controlled Substances/Alcohol, Hazardous Materials Compliance (HM), and Driver Fitness.

In each BASIC, the SMS calculates a quantifiable measure of a motor carrier's performance. The SMS groups carriers by BASIC with other carriers that have a similar number of safety events (e.g., crashes, inspections, or violations). The SMS then ranks these carriers based on their BASIC measure, assigning them a percentile from 0−100 (the higher the percentile, the worse the safety performance).

The SMS also prioritizes carriers for interventions using a set of violations known as Acute and Critical Violations. This set of violations is defined in the current Safety Fitness Procedures (49 CFR 385 Appendix B). If a carrier has been found with one or more Acute and/or Critical Violations within the past 12 months during an investigation, the carrier will receive an "Alert" in the corresponding BASICs. The SMS uses both the BASIC percentiles and Acute and Critical Violations to highlight safety performance issues within each BASIC and prioritize carriers for interventions.

Various studies have shown that the SMS is effective in helping the Agency identify high crash-risk carriers for interventions.

- FMCSA's 2014 SMS Effectiveness Test found that six of the seven BASICs identify carriers with a higher future crash rate than the national average for interventions and in all BASICs

[1] An intervention is an action used by FMCSA to encourage or enforce compliance with Federal regulations. Types of interventions include warning letters, roadside inspections, and investigations.

in the for-hire combination carrier segment.[2] The report also found that carriers with one or more BASICs prioritized for interventions have a 79% higher future crash rate compared to active carriers with no BASICs prioritized for interventions.

- A 2012 American Transportation Research Institute (ATRI) report analyzed the five publicly available BASICs.[3] The report showed that carriers with an "Alert" demonstrated higher crash rates than those without "Alerts" in four BASICs.[4] In addition, the report showed that crash risk increases as the number of "Alerts" increases.
- The 2011 independent evaluation of the CSA Operational Model Test found that five of the seven SMS BASICs demonstrated a strong relationship to crash risk.[5]

1.1 Purpose of this Document

The purpose of this document is to explain how motor carriers' safety performance and compliance status in the SMS BASICs causes them to be identified and prioritized for FMCSA interventions. Motor carriers highlighted with a ⚠ (i.e., "Alert") symbol in the corresponding BASIC are prioritized for interventions or further monitoring. This BASIC prioritization status information is currently displayed on the SMS Website.[6]

This revised version of the SMS Methodology document incorporates and consolidates information on how investigation results impact a carrier's prioritization status in each BASIC. These revisions to the SMS Methodology document are intended to make information regarding the SMS methodology easier to access and understand, but do not alter the methodology itself. A brief summary of each section of the document appears below.

Section 2. Design of the SMS BASIC Prioritization Status: describes the seven BASICs, the data sources, and how on-road performance and/or Acute and Critical Violations from prior investigations are used to determine BASIC prioritization status.

Section 3. SMS BASIC Prioritization Status Methodology: explains the methodology used to determine percentiles and how the percentiles and/or investigation results for each BASIC affect the carrier's BASIC prioritization status.

Section 4. SMS Improvement Process: outlines the Agency's improvement process for the SMS.

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[2] *FMCSA, The Carrier Safety Measurement System (CSMS) Effectiveness Test by Behavior Analysis and Safety Improvement Categories (BASICs),* January 2014. The full report is available at: https://csa.fmcsa.dot.gov/Documents/CSMS_Effectiveness_Test_Final_Report.pdf.

[3] ATRI, *Compliance, Safety, Accountability: Analyzing the Relationship of Scores to Crash Risk*, October 2012, http://atri-online.org.

[4] FMCSA prioritizes carriers with "Alerts" for interventions.

[5] University of Michigan Transportation Research Institute (UMTRI), *Evaluation of the CSA 2010 Operational Model Test,* August 2011. https://csa.fmcsa.dot.gov/Documents/Evaluation-of-the-CSA-Op-Model-Test.pdf.

[6] The SMS Website is available at: https://ai.fmcsa.dot.gov/sms/. Pursuant to the Fixing America's Surface Transportation (FAST) Act of 2015, the SMS results previously available on the SMS Website related to property carrier's compliance and safety performance are no longer available for public display. Property carriers must log in to view their complete SMS results.

Appendix A: provides a link to the SMS Appendix A spreadsheet which lists all of the violations used in the SMS by BASIC, along with the corresponding Federal Motor Carrier Safety Regulations (FMCSRs) or Hazardous Materials Regulations (HMRs).

Appendix B: provides a history of the changes made to the SMS methodology to date.

2. Design of the SMS BASIC Prioritization Status

The Safety Measurement System (SMS) is the Federal Motor Carrier Safety Administration's (FMCSA) workload prioritization tool. FMCSA uses the SMS to assess noncompliance by analyzing on-road performance data collected from inspections, crash reports, and Acute and Critical Violations discovered during prior investigations. The SMS uses this safety data to assess carriers in the seven Behavior Analysis and Safety Improvement Categories (BASICs). The BASICs are: Unsafe Driving, Crash Indicator, Hours-of-Service (HOS) Compliance, Vehicle Maintenance, Controlled Substances/Alcohol, Hazardous Materials (HM) Compliance, and Driver Fitness.

Since its inception, the SMS has provided the motor carrier industry and other safety stakeholders with more comprehensive, informative, and regularly updated safety performance data.[7] Findings from the SMS allow the evaluated carriers to identify safety areas where they need to improve. In turn, this information empowers motor carriers and other stakeholders involved with the motor carrier industry to make safety-based business decisions using all available sources of information, including safety fitness determinations (ratings) in FMCSA's Safety and Fitness Electronic Records (SAFER) system, and authority and insurance status in FMCSA's Licensing and Insurance (L&I) system. Access to all of this information was centralized in the August 2014 revisions to the SMS public display.

2.1 Description of the BASICs

The BASICs incorporate violations of the Federal Motor Carrier Safety Regulations (FMCSRs) and the Hazardous Materials Regulations (HMRs), and are organized to focus on behaviors that may cause or increase the severity of crashes. The BASICs are defined as follows:

- Unsafe Driving BASIC—Operation of commercial motor vehicles (CMVs) in a dangerous or careless manner. *Example violations include: speeding, reckless driving, improper lane change, texting while operating a CMV, not wearing safety belts.*
- Crash Indicator BASIC (not publicly available)—Historical pattern of crash involvement, including frequency and severity. This BASIC is based on information from State-reported crashes that meet reportable crash standards. Crashes found to be not preventable by FMCSA's Crash Preventability Determination Program (CPDP) will be listed on the SMS Website as "Reviewed – Not Preventable," but excluded from a carrier's measure and percentile in the Crash Indicator BASIC. This BASIC uses crash history that is not specifically a behavior but instead the consequence of a behavior or a set of behaviors.
- HOS Compliance BASIC—Operation of CMVs by drivers who are ill, fatigued, or in noncompliance with the HOS regulations. This BASIC includes violations of regulations pertaining to records of duty status (RODS) as they relate to HOS requirements and the

[7] *See* 75 Fed. Reg. 18256 (Apr. 9, 2010).

management of CMV driver fatigue. *Example violations include: operating a CMV while ill or fatigued, requiring or permitting a property-carrying CMV driver to drive more than 11 hours, failing to preserve RODS for 6 months/failing to preserve supporting documents.*

- Vehicle Maintenance BASIC—Failure to properly maintain a CMV and prevent shifting loads, spilled or dropped cargo, and overloading of a CMV. *Example violations include: inoperative brakes, lights, and other mechanical defects, improper load securement, failure to make required repairs.*
- Controlled Substances/Alcohol BASIC—Operation of CMVs by drivers who are impaired due to alcohol, illegal drugs, and misuse of prescription or over-the-counter medications. *Example violations include: use or possession of controlled substances or alcohol, failing to implement an alcohol and/or controlled substance testing program.*
- HM Compliance BASIC (not publicly available)—Unsafe handling of HM on a CMV. *Example violations include: failing to mark, label, or placard in accordance with the regulations, not properly securing a package containing HM, leaking containers, failing to conduct a test or inspection on a cargo tank when required by the United States Department of Transportation (U.S. DOT).*
- Driver Fitness BASIC—Operation of CMVs by drivers who are unfit to operate a CMV due to lack of training, experience, or medical qualifications. *Example violations include: failing to have a valid and appropriate commercial driver's license (CDL), being medically unqualified to operate a CMV, failing to maintain driver qualification files.*

In addition to the seven BASICs, there is an Insurance/Other Indicator used for prioritization that incorporates violations found during investigations. The Insurance/Other Indicator is defined as follows:

- Insurance/Other Indicator (not publicly available)—Failure to comply with registration, insurance, or other reporting requirements. *Example violations include: operating a CMV without the minimum level of financial responsibility, failing to maintain copies of crash reports.*

2.2 Data Sources

The SMS assesses an individual carrier's performance by BASIC calculated from information collected from roadside inspections, State-reported CMV crash records, and Acute and Critical Violations from investigations. These data are recorded in the Motor Carrier Management Information System (MCMIS). In addition, motor carrier Census data, also recorded in MCMIS, are used for the identification and normalization of safety event group data. Below are more detailed descriptions of each data source.

- Roadside Inspections are examinations that a certified Motor Carrier Safety Assistance Program (MCSAP) inspector (usually State or local law enforcement personnel) conducts on individual CMVs and drivers to determine if they are in compliance with the FMCSRs and/or HMRs.
    - Violations are recorded during inspections and entered into the MCMIS database. A subset of these violations may result in a driver or vehicle being placed out-of-

service (OOS). The OOS violations must be corrected before the affected driver or vehicle is allowed to return to service. The SMS assessments are based on the safety violations listed in Appendix A. These assessments, however, do not include those violations that are: (1) a result of a crash[8]; (2) assigned exclusively to another entity such as a shipper or Intermodal Equipment Provider (IEP); or (3) indicated as "dismissed/not guilty" based on the adjudicated citation process.

  - *Note*: Some roadside inspections are performed following a traffic enforcement stop for a moving violation. Violations reported on the inspection form during such stops do not always result in the issuance of a citation to the driver, but are used in the SMS whether or not a citation is issued.

- Investigations are examinations that a certified Safety Investigator (SI) conducts on individual motor carriers to evaluate their compliance with the FMCSRs and/or HMRs. There are two types of investigations: Offsite Investigations and Onsite Investigations. Offsite Investigations address emerging safety problems and do not occur at the carrier's principal place of business (PPOB). During an Offsite Investigation, an SI works with the carrier remotely to identify safety problems using documentation that the carrier provides related to each BASIC. Onsite Investigations occur at the carrier's PPOB, and may focus on specific safety problems (Onsite Focused Investigation) or the carrier's entire operations (Onsite Comprehensive Investigation).
  - Violations are recorded during investigations and entered into the MCMIS database. Acute and Critical Violations are a subset of these violations. This subset of violations is defined in the current Safety Fitness Procedures (49 CFR 385 Appendix B). An Acute Violation, also known as a one-time occurrence violation, is triggered by noncompliance so severe that immediate corrective action is required. A Critical Violation, also known as a pattern of occurrence violation, is triggered by a pattern of noncompliance related to the carrier's management or operational controls that is found during an investigation. For more information on each type of violation, see section 2.4.
- State-Reported Commercial Vehicle Crash Data are taken from MCMIS and provide information on crashes as reported by State and local law enforcement officials. Crashes found to be not preventable by FMCSA's CPDP will be listed on the SMS Website as "Reviewed – Not Preventable," but excluded when from a carrier's measure and percentile in the Crash Indicator BASIC. A reportable crash is defined in 49 CFR 390.5 as a crash that involves a CMV operating on a public roadway, which results in a fatality, an injury, and/or a tow-away.
- Motor Carrier Census Data are first collected when a carrier obtains a U.S. DOT number. The

[8] Only pre-existing violations from post-crash inspections are used in the SMS. Violations from post-crashes inspection flagged as "Y" for Yes or "U" for Unknown as being attributed to the crash are not used.

Census data are primarily collected from: (1) Form MCS-150, filled out by the carrier, and (2) Form MCS-151, filled out by law enforcement as part of an investigation. The SMS uses Census data for identification and normalization of safety-related data. Examples of Census data include U.S. DOT number, carrier name, number and type of Power Units (PUs), annualized Vehicle Miles Travelled (VMT), physical location, current status, and types of cargo hauled (e.g., household goods, produce, chemicals, grain, metal, etc.).

2.3 On-Road Design Features

The SMS analyzes a carrier's on-road performance by converting the carrier's inspection and crash data into BASIC measures and percentiles. This conversion involves the application of several SMS design features, as discussed below.

Violation Severity

All roadside inspection violations that pertain to a BASIC are assigned a severity weight that reflects its association with crash occurrence and crash consequences. The severity weights help differentiate the levels of crash risk associated with the various violations attributed to each BASIC.

The violation severity weights in the tables in Appendix A have been converted to a scale from 1 to 10 for each BASIC, where 1 represents the lowest crash risk and 10 represents the highest crash risk relative to the other violations in the BASIC. Since these severity weights are BASIC-specific, two weights that appear identical but are in different BASICs do not represent the same crash risk. For example, a 5 in one BASIC is not equivalent to a 5 in another BASIC. Instead, the 5 represents the midpoint between a crash risk of 1 and 10 within a BASIC. Severity weights from one BASIC should not be added, subtracted, equated, or otherwise combined with the severity weight of a violation from any other BASIC.

Within certain BASICs, additional severity weight is applied to violations that resulted in driver or vehicle OOS Orders. This additional severity weight for OOS conditions, as with the severity weight assigned to each violation, is based on analysis that quantified the extent of these associations between violation and crash risk, as well as input from enforcement subject matter experts. Appendix A describes the severity weights' derivation and provides the specific weights assigned to each roadside inspection violation used in the SMS.

Adjudicated Citations

States may issue a citation (i.e., ticket) associated with a violation noted in the roadside inspection. Such citations may be subsequently adjudicated in a due process system. FMCSA has implemented an adjudicated citations policy that impacts the use of roadside inspection violations in the SMS. Under this policy, violations can be removed or set to a severity weight of 1 in the SMS if the adjudicated citations associated with those violations result in certain outcomes, as indicated in Table 2–1 below.

Table 2–1. Impact of Adjudicated Citation Result on Violation in SMS

Citation Result for a Violation	Violation in SMS
Dismissed/Not guilty	Remove violation (as stated in Section 2.2)
Convicted of a different charge	Severity weight set to 1 and not subject to OOS weight

For violations to be considered for removal or set to a lower severity weight in the SMS, drivers or carriers must submit certified documentation of the judicial proceeding results through a Request for Data Review (RDR) in FMCSA's DataQs system to initiate this process. The results of the process will determine if the violation is removed, set to a severity weight of 1, or retained for use in the SMS. This process only applies to inspections conducted on or after August 23, 2014, and is not retroactive.[9]

Crash Severity

Crashes are assigned severity weights according to their impact. Greater weight is attributed to crashes involving injuries, fatalities, and/or crashes involving the release of HM than to crashes resulting only in a vehicle being towed away from the scene of the crash.

Not Preventable Crashes

Historically, FMCSA used all reportable crashes, regardless of preventability, to identify and prioritize carriers that pose a safety risk for interventions. The Crash Preventability Determination Program (CPDP) allows carriers and drivers to submit evidence that an eligible crash was not preventable. If a crash is found to be not preventable by FMCSA's CPDP, it will be listed on the SMS Website as "Reviewed — Not Preventable," but excluded from a carrier's measure and percentile in the Crash Indicator BASIC.[10]

Time Weights

All on-road safety events are assigned a time weight. The time weight of an event decreases with time. This decline results in more recent events having a greater impact on a carrier's BASIC measures than older events. Safety events older than 24 months are no longer used to assess a carrier's safety posture in the SMS.

Normalization

BASIC measures are normalized to reflect differences in on-road exposure among carriers. The SMS normalizes for the number of driver inspections with driver-related BASICs, and vehicle inspections are

[9] As outlined in the Federal Register Notice published on June 5, 2014 (http://www.fmcsa.dot.gov/regulations/rulemaking/2014-13022).

[10] For more information on FMCSA's CPDP, visit: https://www.fmcsa.dot.gov/crash-preventability-determination-program

used for normalization within vehicle-related BASICs. Therefore, the number of driver inspections normalizes the HOS Compliance, Controlled Substances/Alcohol, and Driver Fitness measures, while the number of vehicle inspections normalizes the Vehicle Maintenance and HM Compliance BASIC measures. The HM Compliance BASIC measure is further qualified to use only vehicle inspections where the carrier was noted as transporting placardable quantities of HM.

While violations of the above BASICs are discovered during an inspection, a distinction is made for behaviors that usually prompt an inspection. For this reason, the SMS also normalizes the Unsafe Driving BASIC measure by carrier size (i.e., a hybrid PU and VMT measure), as this BASIC largely comprises violations such as speeding that initiate an inspection being conducted. Similarly, the Crash Indicator BASIC is also normalized by carrier size.

Segmentation

The Unsafe Driving and Crash Indicator BASICs account for carrier differences by segmenting the carrier population into two groups based on the types of vehicles operated. This segmentation ensures that carriers with fundamentally different types of vehicles/operations are not compared to each other. The two segments are: (1) "Combination" or combination trucks/motor coach buses when these vehicle types constitute 70% or more of the total PU types in a motor carrier's fleet, and (2) "Straight" or straight trucks/other vehicles when these vehicle types constitute more than 30% of the total PUs in a motor carrier's fleet.[11]

Safety Event Groups

To further account for the differences among carriers when assessing their on-road performance, the SMS places carriers in safety event groups based on the number of safety events (e.g., inspections, violations, crashes) in which they have been involved. This tiered approach accounts for the inherently greater variability in rates based on small samples or limited levels of exposure and the stronger level of confidence in measures based on higher exposure. The safety event grouping also allows the SMS to handle the widely diverse motor carrier population while ensuring that similarly situated carriers are treated with the same standards.

Data Sufficiency

The SMS employs data sufficiency standards to ensure that there are enough inspections or crashes to produce meaningful measures of on-road safety performance for carriers. In instances where the safety performance of a carrier can potentially lead to FMCSA interventions, additional data sufficiency tests are employed. These tests ensure that a carrier has a "critical mass" of poor performance data or a pattern of violations, such as having a minimum number of inspections with BASIC-related violations, before adverse action is taken.

[11] Combination vehicles are defined in the Motor Carrier Census as: Truck Tractors and Motor Coach. Straight vehicles are defined as: Straight Trucks, Hazmat Cargo Tank Trucks, School Bus 9-15, School Bus 16+, Mini-Bus 16+, Van 9-15, Limousine 9-15, and Limousine 16+.

Percentile Rank

The SMS uses on-road measures to assign a percentile ranking to each BASIC. Each measure is a quantifiable determination of safety behavior. Percentile ranking allows the safety behavior of a carrier to be compared with the safety behavior of carriers with similar numbers of safety events. Within each safety event group, a percentile is computed on a 0–100 scale for each carrier that receives a non-zero measure, with 100 indicating the worst performance.

Percentiles are generated from measures of U.S.-domiciled interstate and HM carriers. The remaining carriers—intrastate non-HM and non-U.S.-domiciled—are assigned percentiles afterwards based on the equivalent measures-to-percentile relationship of the U.S.-domiciled carriers. Carriers with percentiles above a certain set threshold that meet minimum data sufficiency requirements in a BASIC will be identified for potential FMCSA interventions.

2.4 Investigation Features

SMS assessments in each BASIC consider both percentiles and Acute and Critical Violations related to that BASIC. If a carrier is found with one or more Acute and/or Critical Violations within the past 12 months during an investigation, the carrier will receive a ⚠ symbol in the corresponding BASIC. This ⚠ symbol denotes that the carrier may be prioritized for interventions or further monitoring. The details of the violation will be displayed on the SMS Website in the carrier's investigation results related to that BASIC.

Acute and Critical Violations

Acute and Critical Violations are recorded during Onsite and Offsite Investigations. These violations are defined in the current Safety Fitness Procedures (49 CFR 385 Appendix B). An Acute Violation, also known as a one-time occurrence violation, is triggered by noncompliance discovered during an investigation that is so severe that immediate corrective action is required. Examples of Acute Violations are using a disqualified driver and using a driver known to have tested positive for a controlled substance.

A Critical Violation, also known as a pattern of occurrence violation, is triggered by a pattern of noncompliance related to the carrier's management or operational controls that is found during an investigation. A carrier must meet the following criteria for a Critical Violation to affect the BASIC prioritization status:

- Violations are discovered in at least 10% of the carrier's records checked during an investigation; and
- Out of these records, a pattern of violations (i.e., more than one occurrence) is found.

Examples of Critical Violations are false reports of RODS and failing to maintain a driver qualification file on each driver employed. A complete list of Acute and Critical Violations can be found in Appendix A.

2.5 BASIC Prioritization Status

A carrier's BASIC prioritization status is based on its on-road safety performance percentile and/or any Acute and Critical Violations from an investigation(s) related to that BASIC. FMCSA prioritizes carriers for interventions based on the number of percentiles a carrier has at or above the established BASIC Intervention Thresholds and/or if the carrier has been found with one or more Acute and/or Critical Violations within the past 12 months during an investigation. If a carrier receives a ⚠ symbol in a BASIC, the carrier may be prioritized for interventions such as warning letters and investigations, or may be subject to further monitoring.

BASIC Intervention Thresholds

The Intervention Thresholds for each BASIC listed in Table 2–2 below show that these thresholds are set at various BASIC percentiles. Because higher percentiles represent worse safety performance, a lower BASIC Intervention Threshold percentile represents a more stringent safety criterion. FMCSA's analysis has shown that the Unsafe Driving, Crash Indicator, and HOS Compliance BASICs have the strongest associations to crash risk.[12] Therefore, the BASICs with stronger associations to future crash involvement have a lower Intervention Threshold than the other BASICs. Similarly, passenger and HM carriers have lower Intervention Thresholds because when they are involved in crashes the consequences are often greater.

Table 2–2. BASIC Intervention Thresholds

BASIC	Intervention Thresholds		
	Passenger Carrier	**HM**	**General**
Unsafe Driving, Crash Indicator, HOS Compliance	50%	60%	65%
Vehicle Maintenance, Controlled Substances/Alcohol, Driver Fitness	65%	75%	80%
HM Compliance	80%	80%	80%

Intervention Threshold Definitions by Carrier Type

A carrier is subject to one of the three Intervention Thresholds based on its carrier type: passenger carrier, HM, or general. The general Intervention Threshold applies to most carriers except for those that meet the passenger carrier or HM Intervention Thresholds. Definitions of the passenger carrier and the HM Intervention Thresholds are provided in Table 2–3 and Table 2–4 below.

[12] FMCSA, The Carrier Safety Measurement System (CSMS) Effectiveness Test by Behavior Analysis and Safety Improvement Categories (BASICs), January 2014. The full report is available at: https://csa.fmcsa.dot.gov/Documents/CSMS_Effectiveness_Test_Final_Report.pdf.

Table 2–3. Passenger Carrier Intervention Threshold Definition

Passenger Carrier Intervention Threshold Definition
1) Carrier Meets Passenger Authority Criteria a. Carrier has "active" passenger authority in L&I AND b. At least 2% of the carrier's PUs are 9+ passenger capacity vehicles
2) OR Carrier Meets For-Hire Criteria a. Carrier has selected a "for-hire" operation type on the MCS-150 AND b. One of the following: i. At least 2% of the carrier's PUs are 9+ passenger capacity vehicles ii. The carrier has registered no PUs on the MCS-150 and has selected "passengers" as a type of cargo they carry
3) OR Carrier Meets Private Passenger Criteria a. Carrier has selected a "private passenger" operation type on the MCS-150 AND b. At least 2% of the carrier's PUs are 16+ passenger capacity vehicles

Table 2–4. HM Intervention Threshold Definition

HM Intervention Threshold Definition
1) Carrier Meets All Three of the HM Inspection Criteria Listed Below a. At least 2 HM placardable vehicle inspections in the past 24 months AND b. At least 1 HM placardable vehicle inspections in the past 12 months AND c. At least 5% of vehicle inspections are HM placardable inspections
2) OR Has a Hazardous Materials Safety Permit (HMSP)

3. SMS BASIC Prioritization Status Methodology

The Safety Measurement System (SMS) determines a carrier's prioritization status (i.e., prioritized or not prioritized) in each Behavior Analysis and Safety Improvement Category (BASIC) based on the carrier's on-road performance and/or investigation results. A carrier's relative on-road performance is indicated by its BASIC percentile. Investigation results reflect if any Acute and Critical Violations are found in a given BASIC during investigations. A carrier can be prioritized for interventions because its percentile is at or above the Intervention Threshold and/or it has one or more Acute and/or Critical Violations related a particular BASIC. The following sections describe the SMS methodology used to determine a carrier's prioritization status in each BASIC.

3.1 Unsafe Driving BASIC Prioritization Status Assessment

The sections below describe how a carrier's Unsafe Driving percentile and investigation results are determined and how they both affect the carrier's prioritization status. The Unsafe Driving BASIC is defined as:

- Operation of commercial motor vehicles (CMVs) in a dangerous or careless manner. *Example violations include: speeding, reckless driving, improper lane change, texting while operating a CMV, not wearing safety belts.*

On-Road Performance

The SMS assesses the Unsafe Driving BASIC using applicable violations recorded during roadside inspections to calculate a measure for motor carriers. Individual carriers' BASIC measures also incorporate carrier size in terms of Power Units (PUs) and annual Vehicle Miles Travelled (VMT). These measures are used to generate percentile ranks that reflect each carrier's safety posture relative to carriers with similar numbers of inspections with applicable violations.

Calculation of BASIC Measure

The measures for the Unsafe Driving BASIC are calculated as the sum of severity- and time-weighted applicable violations divided by carrier average PUs multiplied by a Utilization Factor, as follows:

$$BASIC\ Measure = \frac{Total\ of\ \ time\ and\ severity\ \ weighted\ applicable\ violations}{Average\ \ PUs\ x\ Utilization\ \ Factor}$$

Equation 3–1

In this equation, the terms are defined as follows:

An Applicable Violation is a violation recorded in any Driver Inspection (Level 1, 2, 3, or 6) that matches the Federal Motor Carrier Safety Regulations (FMCSRs) and Hazardous Materials Regulations (HMRs) cites listed in Appendix A during the past 24 months. In cases of multiple counts of the same violation, the SMS uses each violation cite only once per inspection.

Note: Some roadside inspections are performed following a traffic enforcement stop for a

moving violation. Violations reported on the inspection form during such stops do not always result in issuing a citation/ticket to the driver, but are used in the SMS whether or not a citation/ticket is issued.

A Severity Weight from 1 (less severe) to 10 (most severe) is assigned to each applicable violation. See Appendix A for the severity weights corresponding to each violation. The severity weighting of each violation cite accounts for the level of crash risk relative to the other violation cites used in the BASIC measurement. [13] The sum of all violation severity weights for any one inspection in any one BASIC is capped at a maximum of 30. This cap of 30 is applied before the severity weights are multiplied by the time weight. Out-of-service (OOS) weights are not assigned for Unsafe Driving violations as most violations in this category are not considered OOS violations.

Note: The severity weights of violations outside of the BASIC being calculated **do not** count towards the violation cap.

A Time Weight of 1, 2, or 3 is assigned to each applicable violation based on how long ago it was recorded. Violations recorded in the past six months receive a time weight of 3. Violations recorded over six months and up to 12 months ago receive a time weight of 2. All violations recorded earlier (older than 12 months but within the past 24 months) receive a time weight of 1. This time-weighting places more emphasis on recent violations relative to older violations.

A Time and Severity Weighted Violation is a violation's severity weight multiplied by its time weight.

Average PUs are used in part to account for each carrier's level of exposure when calculating the BASIC measure. The number of owned, term-leased, and trip-leased PUs (trucks, tractors, HM tank trucks, motor coaches, and school buses) contained in the Census data are used to calculate the PU totals. The average PUs for each carrier are calculated using (i) the carrier's current number of PUs, (ii) the number of PUs the carrier had six months ago, and (iii) the number of PUs the carrier had 18 months ago. The average PU calculation is shown below:

$$AveragePU = \frac{PU_{Current} + PU_{6Months} + PU_{18Months}}{3}$$

Equation 3–2

The Utilization Factor is a multiplier that adjusts the average PU values based on the utilization in terms of VMT per average PU where VMT data in the past 24 months are available. The primary sources of VMT information in the Census are: (1) Form MCS-150, filled out by the carrier, and (2) Form MCS-151, filled out by law enforcement as part of an investigation. Carriers

[13] Violations with an adjudicated citation result of "convicted of a different charge" are set to a severity weight of 1.

are required to update their MCS-150 information biennially.[14] In cases where the VMT data have been obtained multiple times over the past 24 months for the same carrier, the most current positive VMT figure is used. The Utilization Factor is calculated by the following three steps:

i. Carrier Segment

There are two segments into which each motor carrier can be categorized:

- "Combination"—Combination trucks/motorcoaches make up 70% or more of the total PUs in the motor carrier's fleet
- "Straight"—Straight trucks/other vehicles constitute more than 30% of the total PUs in the motor carrier's fleet

ii. VMT per Average PU

The VMT per average PU is derived by taking most recent positive VMT data and dividing it by the average PUs (defined above).

iii. Utilization Factor

Given the information in (i) and (ii), the Utilization Factor is determined from the following tables:

[14] As outlined in the Federal Register Notice published on August 23, 2013 (http://www.gpo.gov/fdsys/pkg/FR-2013-08-23/pdf/2013-20446.pdf).

Table 3–1. VMT per Average PU for Combination Segment

Combination Segment	
VMT per Average PU	**Utilization Factor**
< 80,000	1
80,000-160,000	$1 + \frac{(VMT\ per\ Average\ PU - 80{,}000)}{133{,}333}$ [15]
160,000-200,000	1.6
> 200,000	1
No Recent VMT Information	1

Table 3–2. VMT per Average PU for Straight Segment

Straight Segment	
VMT per Average PU	**Utilization Factor**
< 20,000	1
20,000-60,000	VMT per Average PU/20,000
60,000-200,000	3
> 200,000	1
No Recent VMT Information	1

Calculation of BASIC Percentile Rank

Based on the Unsafe Driving BASIC measure, the SMS applies data sufficiency standards and safety event grouping to assign a percentile rank to carriers. The steps used to calculate percentile ranks for the Unsafe Driving BASIC are outlined below.

A. Determine the carrier's segment – either "Combination" or "Straight", as explained above.

- "Combination"—Combination trucks/motor coach buses constituting 70% or more of the total PU
- "Straight"—Straight trucks/other vehicles constituting more than 30% of the total PU

B. Determine the number of inspections with at least one BASIC violation and remove carriers with less than three such inspections with violations. For the remaining carriers, place each carrier into one of ten groups based on the carrier segment and the number of inspections with an Unsafe

[15] This Utilization Factor equation is a simplified version of the same mathematical equation shown in prior versions of the methodology. The Utilization Factor calculation remains unchanged.

Driving violation. These groups are presented in Table 3–3 and Table 3–4.

Table 3–3. Safety Event Groups for Unsafe Driving BASIC: Combination Segment

Unsafe Driving BASIC: Combination Segment	
Safety Event Group	**Number of Inspections with Unsafe Driving Violations**
Combination 1	3-8
Combination 2	9-21
Combination 3	22-57
Combination 4	58-149
Combination 5	150+

Table 3–4. Safety Event Groups for Unsafe Driving BASIC: Straight Segment

Unsafe Driving BASIC: Straight Segment	
Safety Event Group	**Number of Inspections with Unsafe Driving Violations**
Straight 1	3-4
Straight 2	5-8
Straight 3	9-18
Straight 4	19-49
Straight 5	50+

C. Within each group, rank all the carriers' BASIC measures in ascending order. Remove carrier BASIC measures that are excessively high.[16] Transform the ranked values into percentiles from 0 (representing the lowest BASIC measure) to 100 (representing the highest BASIC measure). Higher percentiles indicate worse performance. Eliminate carriers whose violations in the BASIC are all older than 12 months; remaining carriers retain the previously calculated percentile.

Intervention Thresholds

A carrier with a percentile that is at or above the Intervention Threshold in the Unsafe Driving BASIC will receive a ⚠ symbol in this BASIC. The Intervention Thresholds for the Unsafe Driving BASIC are defined in Table 3–5 below.

[16] Carriers with excessively high Unsafe Driving measures of 250 or greater are removed from the percentile ranking and are assigned the maximum percentile of 100. This prevents carriers with erroneous data from biasing the remaining carriers in the Safety Event Group ranking process.

Table 3–5. Intervention Thresholds for the Unsafe Driving BASIC

Intervention Thresholds for the Unsafe Driving BASIC		
Passenger Carrier	HM	General
50%	60%	65%

Investigation Results

SMS assessments in the Unsafe Driving BASIC also consider Acute and Critical Violations that are found within the past 12 months during an investigation. See Appendix A for a complete list of Acute and Critical Violations related to this BASIC.

A carrier is prioritized for interventions by receiving a ⚠ symbol in this BASIC because it has one or more Acute and/or Critical Violations related to this BASIC and/or its BASIC percentile is at or above the Intervention Threshold.

3.2 Crash Indicator BASIC Prioritization Status Assessment – Not Publicly Available

The sections below describe how a carrier's Crash Indicator BASIC percentile is determined and how it affects the carrier's prioritization status. The Crash Indicator BASIC is defined as:

- Historical pattern of crash involvement, including frequency and severity. This BASIC is based on information from State-reported crashes that meet reportable crash standards. Crashes found to be Not Preventable by FMCSA's Crash Preventability Determination Program (CPDP) will be listed on the SMS Website as "Reviewed – Not Preventable," but excluded from a carrier's measure and percentile in the Crash Indicator BASIC. This BASIC uses crash history that is not specifically a behavior but instead the consequence of a behavior or a set of behaviors.

On-Road Performance

The SMS assesses the Crash Indicator BASIC using relevant State-reported crash data recorded in the Motor Carrier Management Information System (MCMIS). Individual carriers' Crash Indicator BASIC measures also incorporate carrier size in terms of PUs and annual VMT. These measures are used to generate percentile ranks that reflect each carrier's safety posture relative to carriers in the same segment with similar numbers of crashes.

Calculation of BASIC Measure

The measure for the Crash Indicator BASIC is calculated as the sum of severity- and time-weighted crashes divided by carrier average PUs multiplied by a Utilization Factor, as follows:

$$Crash\ Indicator\ Measure = \frac{Total\ of\ time\ and\ severity\ weighted\ applicable\ crashes}{Average\ PUs\ x\ Utilization\ Factor}$$

Equation 3–3

In this equation, the terms are defined as follows:

An Applicable Crash is a State-reported crash that meets the reportable crash standard during the past 24 months. A reportable crash is one that results in at least one fatality; one injury where the injured person is taken to a medical facility for immediate medical attention; or one vehicle having been towed from the scene as a result of disabling damage caused by the crash (i.e., tow-away).

Note: Crashes found to be not preventable by FMCSA's CPDP will be listed on the SMS Website as "Reviewed – Not Preventable," but excluded from a carrier's measure and percentile in the Crash Indicator BASIC.

A Crash Severity Weight places more weight on crashes with more severe consequences. For example, a crash involving an injury or fatality is weighted more heavily than a crash where only a tow-away occurred. An HM release also increases the weighting of a crash, as shown in Table 3–6.

Table 3–6. Crash Severity Weights for Crash Indicator BASIC

Crash Type	Crash Severity Weight
Involves tow-away but no injury or fatality	1
Involves injury or fatality	2
Involves an HM release	Crash Severity Weight (from above) + 1

A Time Weight of 1, 2, or 3 is assigned to each applicable crash based on the time elapsed since the crash occurred. Crashes that occurred within six months of the measurement date receive a time weight of 3. Crashes that occurred over six months and up to 12 months prior to the measurement date receive a time weight of 2. All crashes that happened later (older than 12 months but within the past 24 months of the measurement date) receive a time weight of 1. This time-weighting places more emphasis on recent crashes relative to older crashes.

A Time- and Severity-Weighted Crash is a crash's severity weight multiplied by its time weight.

Average Power Units (PUs) are used in part to account for each carrier's level of exposure when calculating the BASIC measure. The number of owned, term-leased, and trip-leased PUs (trucks, tractors, HM tank trucks, motorcoaches, and school buses) contained in the Census data are used to calculate the PU totals. The average PUs for each carrier are calculated using (i) the carrier's current number of PUs, (ii) the number of PUs the carrier had six months ago, and (iii) the number of PUs the carrier had 18 months ago. The average PU calculation is shown below:

$$AveragePU = \frac{PU_{Current} + PU_{6Months} + PU_{18Months}}{3}$$

Equation 3–4

The Utilization Factor is a multiplier that adjusts the average PU values based on the utilization in terms of VMT per average PU where VMT data in the past 24 months are available. The primary sources of VMT information in the Census are: (1) Form MCS−150, filled out by the carrier, and (2) Form MCS-151, filled out by law enforcement as part of an investigation. Carriers are required to update their MCS-150 information biennially. In cases where the VMT data have been obtained multiple times over the past 24 months for the same carrier, the most current positive VMT figure is used. The Utilization Factor is calculated by the following three steps:

- Carrier Segment

  There are two segments into which each motor carrier is categorized:
  - "Combination"—Combination trucks/motor coach buses constituting 70% or more of the total PU
  - "Straight"—Straight trucks/other vehicles constituting more than 30% of the total PU
- VMT per Average PU

  The VMT per average PU is derived by taking the most recent positive VMT data and dividing it by the average PUs (defined above).
- Utilization Factor

  Given the information in (i) and (ii), the Utilization Factor is determined from Table 3–7 and Table 3–8 below.

Table 3–7. VMT per Average PU for Combination Segment

Combination Segment	
VMT per Average PU	**Utilization Factor**
< 80,000	1
80,000-160,000	$1 + \frac{(VMT\ per\ Average\ PU - 80{,}000)}{133{,}333}$ [17]
160,000-200,000	1.6
> 200,000	1
No Recent VMT Information	1

Table 3–8. VMT per Average PU for Straight Segment

Straight Segment	
VMT per Average PU	**Utilization Factor**
< 20,000	1
20,000-60,000	VMT per Average PU/20,000
60,000-200,000	3
> 200,000	1
No Recent VMT Information	1

Calculation of BASIC Percentile Rank

Based on the Crash Indicator BASIC measure, the SMS applies data sufficiency standards and safety event grouping to assign a percentile rank to carriers. The steps used to calculate percentile ranks for the Crash Indicator BASIC are outlined below.

A. Determine the carrier's segment, as previously described.

- "Combination"—Combination trucks/motor coach buses constituting 70% or more of the total PU
- "Straight"—Straight trucks/other vehicles constituting more than 30% of the total PU

B. For carriers with two or more applicable crashes, place each carrier into one of ten groups based on the carrier segment and number of crashes. These groups are presented in Table 3–9 and Table 3–10.

[17] This Utilization Factor equation is a simplified version of the same mathematical equation shown in prior versions of the methodology. The Utilization Factor calculation remains unchanged.

Table 3–9. Safety Event Groups for the Crash Indicator BASIC: Combination Segment

Crash Indicator BASIC: Combination Segment	
Safety Event Group	**Number of Crashes**
Combination 1	2-3
Combination 2	4-6
Combination 3	7-16
Combination 4	17-45
Combination 5	46+

Table 3–10. Safety Event Groups for the Crash Indicator BASIC: Straight Segment

Crash Indicator BASIC: Straight Segment	
Safety Event Group	**Number of Crashes**
Straight 1	2
Straight 2	3-4
Straight 3	5-8
Straight 4	9-26
Straight 5	27+

C. Within each group, rank all the carriers' Crash Indicator BASIC measures in ascending order. Transform the ranked values into percentiles from 0 (representing the lowest BASIC measure) to 100 (representing the highest BASIC measure). Higher percentiles indicate worse performance. Remove carriers that did not have a crash recorded in the previous 12 months. Carriers that remain retain the previously calculated percentile.

Intervention Thresholds

A carrier with a percentile that is at or above the Intervention Threshold in the Crash Indicator BASIC will receive a ⚠ symbol in this BASIC. The Intervention Thresholds for the Crash Indicator BASIC are defined in Table 3–11 below.

Table 3–11. Intervention Thresholds for the Crash Indicator BASIC

Intervention Thresholds for the Crash Indicator BASIC		
Passenger Carrier	HM	General
50%	60%	65%

3.3 HOS Compliance BASIC Prioritization Status Assessment

The sections below describe how a carrier's Hours-of-Service (HOS) Compliance BASIC percentile and

investigation results are determined and how they both affect the carrier's prioritization status. The HOS Compliance BASIC is defined as:

- Operation of CMVs by drivers who are ill, fatigued, or in noncompliance with the HOS regulations. This BASIC includes violations of regulations pertaining to records of duty status (RODS) as they relate to HOS requirements and the management of CMV driver fatigue. *Example violations include: operating a CMV while ill or fatigued, requiring or permitting a property-carrying CMV driver to drive more than 11 hours, failing to preserve RODS for 6 months/failing to preserve supporting documents.*

On-Road Performance

The SMS assesses the HOS Compliance BASIC using applicable violations recorded during roadside inspections to calculate a measure for motor carriers. These measures are used to generate percentile ranks that reflect each carrier's safety posture relative to carriers with similar numbers of relevant inspections.

Calculation of BASIC Measure

The equation for calculating HOS Compliance BASIC measures is defined below.

$$BASIC\ Measure = \frac{Total\ of\ \ time\ and\ \ severity\ \ weighted\ applicable\ violations}{Total\ \ time\ \ weight\ \ of\ relevant\ \ inspections}$$

Equation 3–5

In this equation, the terms are defined as follows:

An Applicable Violation is a violation recorded in any Driver Inspection (Level 1, 2, 3, or 6) that matches the FMCSRs listed in Appendix A during the past 24 months. The SMS uses each violation cite only once per inspection in cases of multiple counts of the same violation.

A Relevant Inspection is any Driver Inspection (Level 1, 2, 3, or 6), including those that do not result in a violation in the BASIC.

A Severity Weight is assigned to each applicable violation, with a value dependent on two parts: (i) the level of crash risk relative to the other violations comprising the BASIC measurement, and (ii) whether or not the violation resulted in an OOS condition.

i. The level of crash risk is assigned to each applicable violation ranging from 1 (less severe) to 10 (most severe); see Appendix A for the violations' corresponding severity weights.
ii. OOS violations receive an additional severity weight of 2. In cases where there are multiple occurrences of the same violation, this weight applies to any of those violations

that meet the OOS conditions.[18]

The sum of all violation severity weights for any one inspection in any one BASIC is capped at a maximum of 30. This cap of 30 is applied before the severity weights are multiplied by the time weight.

Note: The severity weights of violations outside of the BASIC being calculated **do not** count towards the violation cap.

A Time Weight of 1, 2, or 3 is assigned to each applicable violation and each relevant inspection based on its age. Violations/inspections recorded in the past six months receive a time weight of 3. Violations/inspections recorded over six months and up to 12 months ago receive a time weight of 2. All violations/inspections recorded earlier (older than 12 months but within the past 24 months) receive a time weight of 1. This time-weighting places more emphasis on results of recent inspections relative to older inspections.

Note: The time weight is applied to all relevant inspections, including those that do not result in a violation in the BASIC.

A Time- and Severity-Weighted Violation is a violation's severity weight multiplied by its time weight.

Calculation of BASIC Percentile Rank

Based on the HOS Compliance BASIC measure, the SMS applies data sufficiency standards and safety event grouping to assign a percentile rank to carriers. The steps used to calculate percentile ranks for the HOS Compliance BASIC are outlined below.

A. Determine the number of relevant inspections and the number of inspections with at least one BASIC violation. For the HOS Compliance BASIC, remove carriers with (1) less than three relevant driver inspections, or (2) no inspections resulting in at least one BASIC violation. For the remaining carriers, place each carrier into one of five groups based on the number of relevant inspections. The groups are presented in Table 3–12.

[18] Violations with an adjudicated citation result of "convicted of a different charge" are set to a severity weight of 1 and are not subject to additional OOS severity weights of 2.

Table 3–12. Safety Event Groups for the HOS Compliance BASIC

Safety Event Group	Number of Relevant Inspections
1	3-10
2	11-20
3	21-100
4	101-500
5	501+

B. Within each group, rank all the carriers' BASIC measures in ascending order. Transform the ranked values into percentiles from 0 (representing the lowest BASIC measure) to 100 (representing the highest BASIC measure). Higher percentiles indicate worse performance. Eliminate carriers that meet both of the following criteria: (1) no violation was recorded in the BASIC during the previous 12 months, and (2) no violation in the BASIC was recorded during the latest relevant inspection. For the remaining carriers with three or more relevant inspections resulting in an HOS Compliance BASIC violation, assign the percentile values to each carrier's BASIC.

Intervention Thresholds

A carrier with a percentile that is at or above the Intervention Threshold in the HOS Compliance BASIC will receive a ⚠ symbol in this BASIC. The Intervention Thresholds for the HOS Compliance BASIC are defined in Table 3–13 below.

Table 3–13. Intervention Thresholds for the HOS Compliance BASIC

Intervention Thresholds for the HOS Compliance BASIC		
Passenger Carrier	HM	General
50%	60%	65%

Investigation Results

SMS assessments in the HOS Compliance BASIC also consider Acute and Critical Violations that are found within the past 12 months during investigations. See Appendix A for a complete list of Acute and Critical Violations related to this BASIC.

A carrier is prioritized for interventions by receiving a ⚠ symbol in this BASIC because it has one or more Acute and/or Critical Violations related to this BASIC and/or its BASIC percentile is at or above the Intervention Threshold.

3.4 Vehicle Maintenance BASIC Prioritization Status Assessment

The sections below describe how a carrier's Vehicle Maintenance BASIC percentile and investigation results are determined and how they both affect the carrier's prioritization status. The Vehicle Maintenance BASIC is defined as:

- Failure to properly maintain a CMV and prevent shifting loads, spilled or dropped cargo, and overloading of a CMV. *Example violations include: inoperative brakes, lights, and other mechanical defects, improper load securement, failure to make required repairs.*

On-Road Performance

The SMS assesses the Vehicle Maintenance BASIC using applicable violations recorded during roadside inspections to calculate a measure for motor carriers. These measures are used to generate percentile ranks that reflect each carrier's safety posture relative to carriers with similar numbers of relevant inspections.

Calculation of BASIC Measure

The equation for calculating Vehicle Maintenance BASIC measures is defined below.

$$BASIC\ Measure = \frac{Total\ of\ \ time\ and\ severity\ \ weighted\ applicable\ violations}{Total\ \ time\ \ weight\ of\ \ relevant\ inspections}$$

Equation 3–6

In this equation, the terms are defined as follows:

An Applicable Violation is defined as a violation recorded in any Vehicle Inspection (Level 1, 2, 5, or 6) that matches the FMCSR cites listed in Appendix A during the past 24 months. In cases of multiple counts of the same violation, the SMS uses each violation cite only once per inspection.

A Relevant Inspection is any Vehicle Inspection (Level 1, 2, 5, or 6), including those that do not result in a violation in the BASIC.

A Severity Weight is assigned to each applicable violation with a value dependent on two parts: (i) the level of crash risk relative to the other violation cites used in the BASIC measurement, and (ii) whether or not the violation resulted in an OOS condition.

i. The level of crash risk is assigned to each applicable violation ranging from 1 (less severe) to 10 (most severe); see Appendix A for the corresponding severity weights of each violation cite.
ii. OOS violations receive an additional severity weight of 2. In cases where there are multiple occurrences of the same violation, this weight applies to any of those violations

that meet the OOS conditions.[19]

The sum of all violation severity weights for any one inspection in any one BASIC is capped at a maximum of 30. This cap of 30 is applied before the severity weights are multiplied by the time weight.

Note: The severity weights of violations outside of the BASIC being calculated **do not** count towards the violation cap.

A Time Weight of 1, 2, or 3 is assigned to each applicable violation and each relevant inspection based on its age. Violations/inspections recorded in the past six months receive a time weight of 3. Violations/inspections recorded over six months and up to 12 months ago receive a time weight of 2. All violations/inspections recorded earlier (older than 12 months but within the past 24 months) receive a time weight of 1. This time-weighting places more emphasis on results of recent inspections relative to older inspections.

Note: The time weight is applied to all relevant inspections, including those that do not result in a violation in the BASIC.

A Time- and Severity-Weighted Violation is a violation's severity weight multiplied by its time weight.

Calculation of BASIC Percentile Rank

Based on the Vehicle Maintenance BASIC measure, the SMS applies data sufficiency standards and safety event grouping to assign a percentile rank to carriers. The steps used to calculate the percentile ranks for the Vehicle Maintenance BASIC are outlined below.

A. Determine the number of relevant vehicle inspections and the number of inspections with at least one BASIC violation. Remove carriers with (1) less than five relevant inspections, or (2) no inspections resulting in at least one BASIC violation. For the remaining carriers, place each carrier into one of five groups based on the number of relevant inspections. The groups are presented in Table 3–14.

[19] Violations with an adjudicated citation result of "convicted of a different charge" are set to a severity weight of 1 and are not subject to additional OOS severity weights of 2.

Table 3–14. Safety Event Groups for the Vehicle Maintenance BASIC

Safety Event Group	Number of Relevant Inspections
1	5-10
2	11-20
3	21-100
4	101-500
5	501+

B. Within each group, rank all the carriers' BASIC measures in ascending order. Transform the ranked values into percentiles from 0 (representing the lowest BASIC measure) to 100 (representing the highest BASIC measure). Higher percentiles indicate worse performance. Eliminate carriers that meet both of the following criteria: (1) no violation was recorded in the BASIC during the previous 12 months, and (2) no violation in the BASIC was recorded during the latest relevant inspection. For the remaining carriers with five or more relevant inspections resulting in a Vehicle Maintenance BASIC violation, assign the percentile values to each carrier's BASIC.

Intervention Thresholds

A carrier with a percentile that is at or above the Intervention Threshold in the Vehicle Maintenance BASIC will receive a ⚠ symbol in this BASIC. The Intervention Thresholds for the Vehicle Maintenance BASIC are defined in Table 3–15 below.

Table 3–15. Intervention Thresholds for the Vehicle Maintenance BASIC

Intervention Thresholds for the Vehicle Maintenance BASIC		
Passenger Carrier	HM	General
65%	75%	80%

Investigation Results

SMS assessments in the Vehicle Maintenance BASIC also consider Acute and Critical Violations that are found within the past 12 months during investigations. See Appendix A for a complete list of Acute and Critical Violations related to this BASIC.

A carrier is prioritized for interventions by receiving a ⚠ symbol in this BASIC because it has one or more Acute and/or Critical Violations related to this BASIC and/or its BASIC percentile is at or above the Intervention Threshold.

3.5 Controlled Substances/Alcohol BASIC Prioritization Status Assessment

The section below describes how a carrier's Controlled Substances/Alcohol BASIC percentile and investigation results are determined and how they both affect the carrier's prioritization status. The

Controlled Substances/Alcohol BASIC is defined as:

- Operation of CMVs by drivers who are impaired due to alcohol, illegal drugs, and misuse of prescription or over-the-counter medications. *Example violations include: use or possession of controlled substances or alcohol, failing to implement an alcohol and/or controlled substance testing program.*

On-Road Performance

The SMS assesses the Controlled Substances/Alcohol BASIC using applicable violations of FMCSRs recorded during roadside inspections and reported in MCMIS. Individual carriers' BASIC measures also incorporate a quantity of relevant roadside inspections. These measures are used to generate percentile ranks that reflect each carrier's driver safety posture relative to carriers with similar numbers of inspections with violations.

Calculation of BASIC Measure

The BASIC measure for the Controlled Substances/Alcohol BASIC is calculated as the sum of severity- and time-weighted applicable violations divided by time-weighted relevant inspections, as follows:

$$BASIC\ Measure = \frac{Total\ of\ time\ and\ severity\ weighted\ applicable\ violations}{Total\ time\ weight\ of\ relevant\ inspections}$$

Equation 3–7

In this equation, the terms are defined as follows:

An Applicable Violation is defined as a violation recorded in any Driver Inspection (Level 1, 2, 3, or 6) that matches the FMCSR cites listed in Appendix A and during the past 24 months. In cases of multiple counts of the same violation, the SMS uses each violation cite only once per inspection.

Note: Some roadside inspections are performed following a traffic enforcement stop for a moving violation. Violations reported on the inspection form during such stops do not always result in the issuance of a citation/ticket to the driver, but are used in the SMS whether or not a citation/ticket is issued.

A Relevant Inspection is any Driver Inspection (Level 1, 2, 3, or 6), including those that do not result in a violation in the BASIC, or any other inspection resulting in an applicable BASIC violation.

A Severity Weight from 1 (less severe) to 10 (most severe) is assigned to each applicable violation. See Appendix A for the severity weights corresponding to each violation. The severity weighting of each violation cite accounts for the level of crash risk relative to the other violation

cites used in the BASIC measurement.[20] The sum of all violation severity weights for any one inspection in any one BASIC is capped at a maximum of 30. This cap of 30 is applied before the severity weights are multiplied by the time weight. OOS weights are not assigned for Controlled Substance/Alcohol violations, as most violations in this category are considered OOS violations.

Note: The severity weights of violations outside of the BASIC being calculated **do not** count towards the violation cap.

A Time Weight of 1, 2, or 3 is assigned to each applicable violation and each relevant inspection based on its age. Violations/inspections recorded in the past six months receive a time weight of 3. Violations/inspections recorded over six months and up to 12 months ago receive a time weight of 2. All violations/inspections recorded earlier (older than 12 months but within the past 24 months) receive a time weight of 1. This time-weighting places more emphasis on results of recent inspections relative to older inspections.

Note: The time weight is applied to all relevant inspections, including those that **do not** result in a violation in the BASIC.

A Time- and Severity-Weighted Violation is a violation's severity weight multiplied by its time weight.

Calculation of BASIC Percentile Rank

Based on Controlled Substances/Alcohol BASIC measure, the SMS applies data sufficiency standards and safety event grouping to assign a percentile rank to carriers. The steps used to calculate percentile ranks for the Controlled Substances/Alcohol BASIC are outlined below.

A. Remove carriers with no violations in this BASIC. For the remaining carriers, place each carrier into one of four groups based on the number of carrier inspections with applicable violations. The groups are presented in Table 3–16.

Table 3–16. Safety Event Groups for Controlled Substances/Alcohol BASIC

Safety Event Group	Number of Inspections with Controlled Substance/Alcohol Violations
1	1
2	2
3	3
4	4+

B. Within each group, rank all the carriers' BASIC measures in ascending order. Transform the

[20] Violations with an adjudicated citation result of "convicted of a different charge" are set to a severity weight of 1.

ranked values into percentiles from 0 (representing the lowest BASIC measure) to 100 (representing the highest BASIC measure). Higher percentiles indicate worse performance. Eliminate carriers whose violations in the BASIC are all older than 12 months. Remaining carriers retain the previously calculated percentile.

Intervention Thresholds

A carrier with a percentile that is at or above the Intervention Threshold for the Controlled Substances/Alcohol BASIC will receive a ⚠ symbol in this BASIC. The Intervention Thresholds for the Controlled Substances/Alcohol BASIC are defined in Table 3–17 below.

Table 3–17. Intervention Thresholds for the Controlled Substances/Alcohol BASIC

Intervention Thresholds for the Controlled Substances/Alcohol BASIC		
Passenger Carrier	HM	General
65%	75%	80%

Investigation Results

SMS assessments in the Controlled Substances/Alcohol BASIC also consider Acute and Critical Violations that are found within the past 12 months during investigations. See Appendix A for a complete list of Acute and Critical Violations related to this BASIC.

A carrier is prioritized for interventions by receiving a ⚠ symbol in this BASIC because it has one or more Acute and/or Critical Violations related to this BASIC and/or its BASIC percentile is at or above the Intervention Threshold.

3.6 HM Compliance BASIC Prioritization Status Assessment – Not Publicly Available

The section below describes how a carrier's HM Compliance BASIC percentile and investigation results are determined and how they both affect the carrier's prioritization status. The HM Compliance BASIC is defined as:

- Unsafe handling of HM on a CMV. *Example violations include: failing to mark, label, or placard in accordance with the regulations, not properly securing a package containing HM, leaking containers, failing to conduct a test or inspection on a cargo tank when required by the U.S. DOT.*

On-Road Performance

The SMS assesses the HM Compliance BASIC using applicable violations recorded during roadside inspections where placardable quantities of HM are being transported to calculate a measure of each BASIC for individual motor carriers. These measures are used to generate percentile ranks that reflect each carrier's safety posture relative to carriers with similar numbers of relevant inspections.

Calculation of BASIC Measure

The equation for calculating the HM Compliance BASIC measure is defined below.

$$BASIC\ Measure = \frac{Total\ of\ time\ and\ severity\ weighted\ applicable\ violations}{Total\ time\ weight\ of\ relevant\ inspections}$$

Equation 3–8

In this equation, the terms are defined as follows:

An Applicable Violation is defined as a violation recorded in any Vehicle Inspection (Level 1, 2, 5, or 6), where placardable quantities of HM are being transported, that matches the FMCSR and HMR cites listed in Appendix A during the past 24 months. In cases of multiple counts of the same violation, the SMS uses each violation cite only once per inspection.

A Relevant Inspection is any Vehicle Inspection (Level 1, 2, 5, or 6), where placardable quantities of HM are being transported.

A Severity Weight is assigned to each applicable violation with a value dependent on two parts: (i) the level of crash risk relative to the other violation cites used in the BASIC measurement, and (ii) whether or not the violation resulted in an OOS condition.

i. The level of crash risk is assigned to each applicable violation ranging from 1 (less severe) to 10 (most severe); see Appendix A for the corresponding severity weights of each violation cite.
ii. OOS violations receive an additional severity weight of 2. In cases where there are multiple occurrences of the same violation, this weight applies to any of those violations that meet the OOS conditions.[21]

The sum of all violation severity weights for any one inspection in any one BASIC is capped at a maximum of 30. This cap of 30 is applied before the severity weights are multiplied by the time weight.

Note: The severity weights of violations outside of the BASIC being calculated **do not** count towards the violation cap.

A Time Weight of 1, 2, or 3 is assigned to each applicable violation and each relevant inspection based on its age. Violations/inspections recorded in the past six months receive a time weight of 3. Violations/inspections recorded over six months and up to 12 months ago receive a time weight of 2. All violations/inspections recorded earlier (older than 12 months but within the past 24 months) receive a time weight of 1. This time-weighting places more emphasis on results of recent inspections relative to older inspections.

[21] Violations with an adjudicated citation result of "convicted of a different charge" are set to a severity weight of 1 and are not subject to additional OOS severity weights of 2.

Note: The time weight is applied to all relevant inspections, including those that **do not** result in a violation in the BASIC.

A Time- and Severity-Weighted Violation is a violation's severity weight multiplied by its time weight.

Calculation of BASIC Percentile Rank

Based on the HM Compliance BASIC measure, the SMS applies data sufficiency standards and safety event grouping to assign a percentile rank to carriers. The steps used to calculate percentile ranks for the HM Compliance BASIC are outlined below.

A. Determine the number of relevant inspections and the number of inspections with at least one BASIC violation. Remove carriers with (1) less than five relevant inspections, or (2) no inspections resulting in at least one BASIC violation. For the remaining carriers, place each carrier into one of five groups based on the number of relevant inspections. These groups are presented in Table 3–18.

Table 3–18. Safety Event Groups for the HM Compliance BASIC

Safety Event Group	Number of Relevant Inspections
1	5-10
2	11-15
3	16-40
4	41-100
5	101+

B. Within each group, rank all the carriers' BASIC measures in ascending order. Transform the ranked values into percentiles from 0 (representing the lowest BASIC measure) to 100 (representing the highest BASIC measure). Higher percentiles indicate worse performance. Eliminate carriers that meet both of the following criteria: (1) no violation was recorded in the BASIC during the previous 12 months, and (2) no violation in the BASIC was recorded during the latest relevant inspection. For the remaining carriers with five or more relevant inspections resulting in an HM Compliance BASIC violation, assign the percentile values to each carrier's BASIC.

Intervention Thresholds

A carrier with a percentile that is at or above the Intervention Threshold for the HM Compliance BASIC will receive a ⚠ symbol in this BASIC. The Intervention Thresholds for the HM Compliance BASIC are defined in Table 3–19 below.

Table 3–19. Intervention Thresholds for the HM Compliance BASIC

Intervention Thresholds for the HM Compliance BASIC		
Passenger Carrier	HM	General
80%	80%	80%

Investigation Results

SMS assessments in the HM Compliance BASIC also consider Acute and Critical Violations that are found within the past 12 months during investigations. See Appendix A for a complete list of Acute and Critical Violations related to this BASIC.

A carrier is prioritized for interventions by receiving a ⚠ symbol in this BASIC because it has one or more Acute and/or Critical Violations related to this BASIC and/or its BASIC percentile is at or above the Intervention Threshold.

3.7 Driver Fitness BASIC Prioritization Status Assessment

The section below describes how a carrier's Driver Fitness BASIC percentile and investigation results are determined and how they both affect the carrier's prioritization status. The Driver Fitness BASIC is defined as:

- Operation of CMVs by drivers who are unfit to operate a CMV due to lack of training, experience, or medical qualifications. *Example violations include: failing to have a valid and appropriate commercial driver's license (CDL), being medically unqualified to operate a CMV, failing to maintain driver qualification files.*

On-Road Performance

The SMS assesses the Driver Fitness BASIC using applicable violations recorded during roadside inspections to calculate a measure for individual motor carriers. These measures are used to generate percentile ranks that reflect each carrier's driver safety posture relative to carriers with similar numbers of relevant inspections.

Calculation of BASIC Measure

The equation for calculating the Driver Fitness BASIC measure is defined below.

$$BASIC\ Measure = \frac{Total\ of\ \ time\ and\ severity\ weighted\ applicable\ violations}{Total\ \ time\ \ weight\ of\ \ relevant\ \ inspections}$$

Equation 3–9

In this equation, the terms are defined as follows:

An Applicable Violation is a violation recorded in any Driver Inspection (Level 1, 2, 3, or 6) that matches the FMCSRs and HMRs listed in Appendix A during the past 24 months. The SMS uses each violation cite only once per inspection in cases of multiple counts of the same violation.

A Relevant Inspection is any Driver Inspection (Level 1, 2, 3, or 6), including those that do not result in a violation in the BASIC.

A Severity Weight is assigned to each applicable violation, with a value dependent on two parts: (i) the level of crash risk relative to the other violations comprising the BASIC measurement, and (ii) whether or not the violation resulted in an OOS condition.

i. The level of crash risk is assigned to each applicable violation ranging from 1 (less severe) to 10 (most severe); see Appendix A for the violations' corresponding severity weights.
ii. OOS violations receive an additional severity weight of 2. In cases where there are multiple occurrences of the same violation, this weight applies to any of those violations that meet the OOS conditions.[22]

The sum of all violation severity weights for any one inspection in any one BASIC is capped at a maximum of 30. This cap of 30 is applied before the severity weights are multiplied by the time weight.

Note: The severity weights of violations outside of the BASIC being calculated **do not** count towards the violation cap.

A Time Weight of 1, 2, or 3 is assigned to each applicable violation and each relevant inspection based on its age. Violations/inspections recorded in the past six months receive a time weight of 3. Violations/inspections recorded over six months and up to 12 months ago receive a time weight of 2. All violations/inspections recorded earlier (older than 12 months but within the past 24 months) receive a time weight of 1. This time-weighting places more emphasis on results of recent inspections relative to older inspections.

Note: The time weight is applied to all relevant inspections, including those that **do not** result in a violation in the BASIC.

A Time- and Severity-Weighted Violation is a violation's severity weight multiplied by its time weight.

Calculation of BASIC Percentile Rank

Based on the Driver Fitness BASIC measure, the SMS applies data sufficiency standards and safety event grouping to assign a percentile rank to carriers. The steps used to calculate percentile ranks for the Driver Fitness BASIC are outlined below.

A. Determine the number of relevant inspections and the number of inspections with at least one BASIC violation. For the Driver Fitness BASIC, remove carriers with (1) less than five relevant

[22] Violations with an adjudicated citation result of "convicted of a different charge" are set to a severity weight of 1 and are not subject to additional OOS severity weights of 2.

driver inspections, or (2) no inspections resulting in at least one BASIC violation. For the remaining carriers, place each carrier into one of five groups based on the number of relevant inspections. These groups are presented in Table 3–20.

Table 3–20. Safety Event Groups for the Driver Fitness BASIC

Safety Event Group	Number of Relevant Inspections
1	5-10
2	11-20
3	21-100
4	101-500
5	501+

B. Within each group, rank all the carriers' BASIC measures in ascending order. Transform the ranked values into percentiles from 0 (representing the lowest BASIC measure) to 100 (representing the highest BASIC measure). Higher percentiles indicate worse performance. Eliminate carriers that meet both of the following criteria: (1) no violation was recorded in the BASIC during the previous 12 months, and (2) no violation in the BASIC was recorded during the latest relevant inspection. For the remaining carriers with five or more relevant inspections resulting in a Driver Fitness BASIC violation, assign the percentile values to each carrier's BASIC.

Intervention Thresholds

A carrier with a percentile that is at or above the Intervention Threshold for the Driver Fitness BASIC will receive a ⚠ symbol in this BASIC. The Intervention Thresholds for the Driver Fitness BASIC are defined in Table 3–21 below.

Table 3–21. Intervention Thresholds for the Driver Fitness BASIC

Intervention Thresholds for the Driver Fitness BASIC		
Passenger Carrier	HM	General
65%	75%	80%

Investigation Results

SMS assessments in the Driver Fitness BASIC also consider Acute and Critical Violations that are found within the past 12 months during investigations. See Appendix A for a complete list of Acute and Critical Violations related to this BASIC.

A carrier is prioritized for interventions by receiving a ⚠ symbol in this BASIC because it has one or more Acute and/or Critical Violations related to this BASIC and/or its BASIC percentile is at or above the Intervention Threshold.

3.8 Insurance/Other Indicator Prioritization Status Assessment – Not Publicly Available

In addition to the BASICs, the SMS determines a carrier's prioritization status in the Insurance/Other Indicator based solely on investigation results. The section below describes how a carrier's investigation results for this Indicator are determined and how they affect the carrier's prioritization status. The Insurance/Other Indicator is defined as:

- Failure to comply with registration, insurance, or other reporting requirements. *Example violations include: operating a CMV without the minimum level of financial responsibility, failing to maintain copies of crash reports.*

Investigation Results

Acute and Critical Violations related to the Insurance/Other Indicator that are found within the past 12 months during investigations affect the carrier's prioritization status in this Indicator. See Appendix A for a complete list of Acute and Critical Violations related to this Indicator.

A carrier is prioritized for interventions by receiving a ⚠ symbol in this Indicator because it has one or more Acute and/or Critical Violations related to this Indicator.

4. SMS Improvement Process

As part of the Federal Motor Carrier Safety Administration's (FMCSA) commitment to transparency, the Agency has taken a systematic approach to making major improvements to the Safety Measurement System (SMS). This approach includes prioritizing and releasing changes as needed, announcing the proposed changes in a Federal Register Notice, and providing a preview period for law enforcement, motor carriers, and other safety stakeholders prior to implementation. The preview period gives stakeholders the opportunity to see the proposed changes to the SMS in advance and provide feedback. The Agency may refine the changes prior to implementation based on feedback from the preview. Finally, the SMS will be enhanced periodically as future research reveals new and useful knowledge about crash causation and about the relationship between crash risk and regulatory compliance.

Appendix A

Overview

This appendix provides a link to the SMS Appendix A spreadsheet that contains all violations used in the Safety Measurement System (SMS), along with the corresponding Federal Motor Carrier Safety Regulations (FMCSRs) or Hazardous Materials Regulations (HMRs) section. In the spreadsheet, each Behavior Analysis and Safety Improvement Category (BASIC) is represented by two tables. The first table lists the BASIC violations and the second table lists Acute and Critical Violations related to this BASIC.

Each BASIC violation is assigned a severity weight that reflects its relevance to crash risk. Crash risk is defined as the risk of crashes occurring and the consequences of the crash after it occurs. Within each BASIC, the violations are grouped based on their attributes so that similar violations can be assigned the same severity weights. Severity weights, discussed in more detail below, only reflect relative crash risk within a BASIC and are not comparable across the BASICs.

Interpretation of the Severity Weights

The violation severity weights in the tables that follow have been converted into a scale from 1 to 10, where 1 represents the lowest crash risk and 10 represents the highest crash risk relative to the other violations in the BASIC. Because the weights reflect the relative importance of each violation only within each particular BASIC, they cannot be compared meaningfully across the various BASICs. Therefore, a 5 in one BASIC is not equivalent to a 5 in another BASIC, but the 5 does represent the approximate midpoint between a crash risk of 1 and 10 within the same BASIC. The "Violation Group" column in each table identifies the group to which each violation has been assigned. Each violation within a violation group is assigned the same severity weight.

Violations in the tables that follow are used by SMS at the specified severity weight unless the citation result associated with the violation is adjudicated and documented as "dismissed/ not guilty." Additionally, when the citation result for a violation is documented as "convicted of a different charge," then the severity weight is set to 1 and it is not subject to an additional out-of-service (OOS) severity weight of 2.

In order for an adjudicated citation result to be documented for a violation (and subsequently impact SMS), drivers or carriers must submit certified documentation of the judicial proceeding results through a Request for Data Review (RDR) in the Federal Motor Carrier Safety Administration's (FMCSA) DataQs system to initiate this process. This process only applies to inspections conducted on or after August 23, 2014.

Derivation of the Severity Weights

In order to determine the severity weights crash involvement and crash consequence, the following five-

step process[23] was invoked:

1. BASIC Mapping—All roadside safety-related violations were mapped to an appropriate BASIC so that the severity weight analysis could be conducted on each BASIC.

2. Violation Grouping—All violations in each BASIC were placed into groups of similar violations based on the judgment of enforcement subject matter experts. These groups, listed in the "Violation Group" column in each table, make it possible to incorporate otherwise rarely discovered violations into the robust statistical analysis used to derive the severity weights. The violation grouping also ensured that similar types of violations received the same severity weight.

3. Crash Occurrence Analysis—Statistical analysis was performed to quantify the extent of the relationship between crash involvement on the one hand and violation rates in each violation group, within each BASIC, on the other hand. A driver approach was used in this analysis. This approach was taken due to strong demonstrable relationships between driver crashes and violations documented in prior research by the Volpe National Transportation Systems Center. The earlier research was conducted in support of FMCSA's Compliance Review Work Group (CRWG), the CSA program's predecessor.

Based on the conclusions from the earlier research, the Volpe Center developed a Driver Information Resource (DIR) for FMCSA. The DIR uses individual crash and inspection reports from all States to construct multi-year driver safety histories for individual commercial drivers. Multivariate negative binomial regression models were used to quantify the strength of relationships between driver violation rates in individual violation groups and crash involvement.

4. Crash Consequences Analysis—While the statistical modeling described in Step 3 provides an empirical basis for associating violations and crash occurrence, it does not address the violations relationship to crash consequence. To factor in the risk associated with crash consequence enforcement subject matter experts representing State and Federal field staff provided input for modifying preliminary severity weight defined in step 3. This approach helped balance the violation risk associated with crash involvement (occurrence) and crash consequence.

5. SMS Effectiveness Test—Various severity weighting schemes developed in steps 1 through 4 were applied to the Safety Measurement System (SMS) to provide an empirical evaluation of the weighting schemes. This empirical evaluation, or "SMS Effectiveness Test," was modeled after the SafeStat Effectiveness Test.[24] The SMS Effectiveness Test was accomplished through the

[23] Carrier Safety Measurement System (CSMS) Violation Severity Weights (Revised November 2009). Prepared for FMCSA by John A. Volpe National Transportation Systems Center (http://www.regulations.gov/#!documentDetail;D=FMCSA-2004-18898-0161).

[24] SafeStat Motor Carrier Safety Status Measurement System Methodology: Version 8.6 (January 2004). Prepared for FMCSA by John A. Volpe National Transportation Systems Center. Chapter 7: SafeStat Evaluation (http://www.regulations.gov/#!documentDetail;D=FMCSA-2004-18898-0223).

following steps: (1) performing a simulated SMS run that calculates carrier percentile ranks for each BASIC using historical data; (2) examining each carrier's crash involvement over the immediate 18 months after the simulated SMS timeframe; and (3) observing the relationship between the percentile ranks in each BASIC and the subsequent post-SMS carrier crash rates. The SMS Effectiveness Test provides an environment to evaluate various severity weighting schemes in terms of their impact in identifying high-risk carriers. It also provides a means of testing other weight schemes, such as the out-of-service (OOS) weight, to help optimize SMS's effectiveness.

Severity Weight Tables 1 through 6 list all of the violations in the SMS, with the first two columns of each table identifying each violation by regulatory part and its associated definition. The third column in each table identifies the violation group to which each violation is assigned, followed by the violation groups' severity weights in the fourth column. The fifth column "Violation in the DSMS (Y/N)" indicates whether or not the violation is used in the Driver Safety Measurement System (DSMS). The methodology for DSMS can be found at: https://csa.fmcsa.dot.gov/Documents/Driver_SMSMethodology.pdf

Note: FMCSA updated Version 3.15 of the methodology to align SMS with the latest changes to violations recorded as part of the roadside inspection program. FMCSA has released new software used to record violations found during roadside inspections. This software often uses different violation codes from existing software. To account for these new violation codes, SMS has incorporated violations cited under these new codes that were discovered on and after February 1, 2023. Only violations cited on or after February 1 are included in SMS calculations. For more details and a complete list of violations, see the SMS Appendix A spreadsheet.

Appendix B

The Federal Motor Carrier Safety Administration (FMCSA) and its stakeholders share a commitment to safety, which has been underscored by strong participation in FMCSA's listening sessions on Compliance, Safety, Accountability (CSA), resulting in constructive input from organizations, enforcement personnel, industry, and motor carrier safety experts. During the Operational Model Test (Op-Model Test) period, FMCSA solicited feedback and suggestions from stakeholders including FMCSA staff, State Partners, industry, and safety advocates and, as a result, the Agency has made changes to enhance the Safety Measurement System (SMS) methodology. FMCSA has continued to make changes to the SMS methodology as part of its continuous improvement process and as part of using the most current set of violations being recorded from inspections. The following provides a history of the SMS methodology changes.

SMS Methodology Changes from Version 1.2 to 2.0 (Implemented August 2010)

1. Modifications to the measure of exposure for the Unsafe Driving Behavior Analysis and Safety Improvement Category (BASIC) and Crash Indicator
2. Refinements to the measurement approach for the Controlled Substances/Alcohol BASIC
3. Updates to the severity weights of roadside violations based on subject matter expert review; and
4. A more strategic approach to addressing motor carriers with a history of vehicle size and weight violations.

Below is detailed information regarding the feedback, analysis, and implementation approach for each of these four enhancements.

1. Modifications to the measure of exposure for the Unsafe Driving BASIC and Crash Indicator

a. Feedback Received: The sole use of number of Power Units (PUs) owned by a motor carrier underestimates the on-road exposure for motor carriers that more extensively utilize their PUs. The use of Vehicle Miles Travelled (VMT) should be considered as a means of assessing the Unsafe Driving BASIC and Crash Indicator that currently rely on PUs.

b. Analysis Conducted: FMCSA has conducted analysis and the results show that measuring exposure solely by PUs may overly identify high-utilization carriers (i.e., carriers with above-average VMT per PU) with high percentiles (which indicates poor performance), while the sole use of VMT overly identifies low-utilization carriers with high percentiles. In addition, complete and accurate data on all carriers' VMT is not currently available.

c. Solution: FMCSA has revised its approach to measure carriers' exposure on the road within the Unsafe Driving BASIC and the Crash Indicator. This new approach uses a combination of PUs and, when available and reliable, VMT data from FMCSA's Motor Carrier Census. Further, the Agency is currently exploring options to enhance the completeness and accuracy of VMT data including confirming the validity of VMT

information from other sources.

d. Implementation Approach:

i. Segmentation—The motor carrier population is segmented into two groups for the Unsafe Driving BASIC and Crash Indicator based on the types of vehicles operated so that companies operating fundamentally different types of vehicles are no longer compared to each other:

1. Segment 1—"Combination": Combination trucks/motor coach buses constituting 70% or more of the total PUs in a carrier's fleet.
2. Segment 2—"Straight": Straight trucks/other vehicles constituting more than 30% of the total PUs in a carrier's fleet.

ii. Utilization Factor—Carriers with above-average truck utilization will receive an adjustment to their PUs called the Utilization Factor, which will provide a safety-based adjustment to the Unsafe Driving BASIC and Crash Indicator percentiles. Only carriers with annualized VMT data reported in the past 24 months on the Motor Carrier Census (obtained via the VMT field on the MCS-150 Form or from a FMCSA investigation) will be eligible to receive an adjustment. Carriers without current VMT will not benefit from the Utilization Factor in their safety assessment calculations.

iii. Safety Event Grouping—The Unsafe Driving BASIC and Crash Indicator will change from using PUs as the basis for safety event grouping (formerly referred to as peer grouping) to using the number of inspections with an Unsafe-Driving-related violation for the Unsafe Driving BASIC and the number of crashes for the Crash Indicator. The safety event grouping allows the SMS to handle the diverse motor carrier population while ensuring similarly situated carriers are treated with the same standard.

2. Refinements to the measurement approach for the Controlled Substances/Alcohol BASIC

a. Feedback Received: Op-Model Test results and law enforcement experts indicated that violations within this BASIC are more likely to be found during an inspection rather than be the cause for an inspection and therefore measuring exposure in this BASIC by number of PUs does not accurately reflect motor carrier exposure.

b. Analysis Conducted: Analysis confirmed that these types of violations are more likely to result from an inspection than to be the cause of the inspection.

c. Solution: The Controlled Substance/Alcohol BASIC measure of exposure will now be based on the number of relevant inspections instead of the number of PUs as in the prior version of the SMS. This BASIC will change from using PUs as the basis for safety event grouping to using number of inspections with a Controlled Substance/Alcohol-related violation.

d. Implementation Approach: This measure is now calculated by the following formula:

$$BASIC\ Measure = \frac{Total\ of\ time\ and\ severity\ weighted\ applicable\ violations}{Total\ time\ weight\ of\ relevant\ inspections}$$

Note: Further information on time and severity weights is available in this SMS Methodology document.

3. Updates to the severity weights of roadside violations based on subject matter expert review

a. Feedback Received: Law enforcement personnel recommended that the violation used in the measurement system be updated to reflect the current set of roadside inspection safety violations. Enforcement personnel, along with the motor carrier industry, also suggested that the severity weights assigned to some violations be reassessed.

b. Analysis Conducted: Subject matter experts from FMCSA's field staff, including enforcement personnel and CSA development team members, examined severity weighting and submitted recommendations for changes to the Agency.

c. Solution: This version of SMS includes updated violations and severity weightings.

d. Implementation Approach: Appendix A in the SMS Methodology contains a complete listing of violations and severity weights.

4. A more strategic approach to addressing motor carriers with a history of size and weight violations

a. Feedback Received: Results from the Op-Model Test have demonstrated the difficulties of enforcing vehicle size and weight violations through CSA interventions conducted by FMCSA and State Safety Investigators (SIs).

b. Analysis Conducted: Alternative methods to address this safety issue are currently under development. These methods include a more refined collection of detailed size and weight violation data and warnings in systems used by roadside inspectors to identify carriers with patterns of prior size and weight violations.

c. Solution: Size and weight violations have been removed from the Cargo-Related BASIC. However, it is important to note that roadside inspectors will continue to cite these violations at the roadside and SIs will continue to address these violations, including potential enforcement actions if appropriate, through investigations.

SMS Methodology Changes from Version 2.0 to 2.1 (Implemented December 2010)

1. Recalibration of the Cargo-Related BASIC severity weights of roadside violations based on subject matter expert review; and
2. A new chapter that provides SMS example calculations.

Below is detailed information regarding the feedback, analysis, and implementation approach for each of these enhancements.

1. Recalibration of the Cargo-Related BASIC severity weights of roadside violations based on subject matter expert review

a. Feedback Received: The motor carrier industry as well as law enforcement personnel suggested that the severity weight of all the load securement violations in the Cargo-Related BASIC that were set to the maximum of 10 were too high.

b. Analysis Conducted: Subject matter experts from FMCSA's field staff and State Partners, including enforcement personnel and CSA development team members, examined severity weighting and submitted recommendations for changes to the Agency.

c. Solution: This version of CMS includes updated violations and severity weightings in the Cargo-Related BASIC.

d. Implementation Approach: Appendix A of the SMS Methodology contains a complete listing of violations and severity weights in the Cargo-Related BASIC.

2. A new chapter that provides SMS example calculations

a. Feedback Received: The motor carrier industry as well as law enforcement personnel suggested that the inclusion of example measurement calculations would help them understand how the SMS results were derived.

b. Analysis Conducted: Analysis confirmed that example calculations will aid users in learning the details behind the SMS.

c. Solution: This version of SMS includes a chapter detailing example measurement calculations.

d. Implementation Approach: Section 4 of the SMS Methodology contains the example calculations.

SMS Methodology Changes from Version 2.1 to 2. 2 (Implemented January 2012)

1. Adding four texting and cell phone use violations in the Unsafe Driving BASIC as shown below; and

Table B–1. Added SMS Unsafe Driving BASIC Violations

BASIC	Section	Violation Description Shown on Driver/Vehicle Examination Report Given to CMV Driver after Roadside Inspection	Violation Group Description	Violation Severity Weight
Unsafe Driving	177.804(b)	Failure to comply with 49 CFR 392.80 - Texting while Oper a CMV - Placardable HM	Texting	10
Unsafe Driving	177.804(c)	Fail to comply with 392.82 - Using Mobile Phone while Oper a CMV - HM	Phone Call	10
Unsafe Driving	392.80(a)	Driving a commercial motor vehicle while Texting	Texting	10
Unsafe Driving	392.82(a)(1)	Using a hand-held mobile telephone while operating a CMV	Phone Call	10
Unsafe Driving	392.82(a)(2)	Allowing or requiring driver to use a hand-held mobile tel while operating a CMV	Phone Call	10

2. Breaking out six current Vehicle Maintenance violations into 22 that provide more descriptive and detailed information about compliance with existing brake, wheel, and coupling regulations. This change will ensure that SMS remains aligned with improvements recently made to roadside data collection systems. Those improvements are the results of a joint FMCSA and Commercial Vehicle Safety Alliance effort to increase data uniformity through improved processes and tools. This change will help to clarify who the responsible party is for the violations, either the motor carrier or the Intermodal Equipment Provider.

The changes are reflected in the violation tables in Appendix A.

SMS Methodology Changes from Version 2.2 to 2.2.1 (Implemented August 2012)

Refinements to driver disqualification violations in the Driver Fitness BASIC.

a. Feedback Received: Stakeholder feedback that indicated that some driver disqualification violations used in SMS are a result of license suspensions for non-safety related reasons, such as failing to pay a parking ticket. Also, feedback from industry indicated that motor carriers often cannot detect driver suspensions when doing required background or annual checks of a driver's driving record in cases where the states outside of the driver's license-issuing State had disqualified the driver.

b. Solution: The refinement to the roadside inspection reporting systems will collect more precise information about drivers operating CMVs while disqualified to improve the Agency's ability to identify noncompliant and unsafe motor carriers. Specifically, the enhancement will allow roadside inspectors to classify disqualified driver violations into different categories depending on whether the driver's license is:

i. Suspended by the driver's license-issuing State or another State; and
ii. Suspended for a safety-related (e.g., speeding or false logs violations) or non-safety related (e.g., failure to pay parking tickets) reason.

This additional information will strengthen the effectiveness and accuracy of the Driver Fitness BASIC. More importantly, it will hold motor carriers accountable for using a driver with a license that has been suspended for safety-related reasons by the driver's license-issuing State.

Table B-2 below shows the definitions and severity weights assigned to the updated violations in roadside inspection systems effective July 20, 2012. To ensure uniform implementation, these changes are not applied retroactively.

Table B–2. Added SMS Driver Fitness BASIC Violations

BASIC	Section	Violation Description Shown on Driver/Vehicle Examination Report Given to CMV Driver after Roadside Inspection	Violation Group Description	Violation Severity Weight
Driver Fitness	383.51A-SIN	Driving a CMV while CDL is suspended for a safety-related or unknown reason and in the state of driver's license issuance.	License-related: High	8
Driver Fitness	383.51A-SOUT	Driving a CMV while CDL is suspended for safety-related or unknown reason and outside the driver's license state of issuance.	License-related: Medium	5
Driver Fitness	383.51A-NSIN	Driving a CMV while CDL is suspended for a non-safety-related reason and in the state of driver's license issuance.	License-related: Medium	5
Driver Fitness	383.51A-NSOUT	Driving a CMV while CDL is suspended for a non-safety-related reason and outside the state of driver's license issuance.	License-related: Low	1
Driver Fitness	391.15A-SIN	Driving a CMV while disqualified. Suspended for safety-related or unknown reason and in the state of driver’s license issuance.	License-related: High	8
Driver Fitness	391.15A-SOUT	Driving a CMV while disqualified. Suspended for a safety-related or unknown reason and outside the driver's license state of issuance.	License-related: Medium	5
Driver Fitness	391.15A-NSIN	Driving a CMV while disqualified. Suspended for non-safety-related reason and in the state of driver's license issuance.	License-related: Medium	5
Driver Fitness	391.15A-NSOUT	Driving a CMV while disqualified. Suspended for a non-safety-related reason and outside the state of driver's license issuance.	License-related: Low	1

SMS Methodology Changes from Version 2.2 to 3.0 (Implemented December 2012)

1. Moved load securement violations into the Vehicle Maintenance BASIC
2. Changed the Cargo-Related BASIC to the HM Compliance BASIC
3. Removed vehicle violations from driver-only inspections and driver violations from vehicle-only inspections
4. Better aligned the SMS with IEP regulations
5. Aligned Electronic Onboard Recorders (EOBRs) to paper equivalent
6. Modified the treatment of 1-5 speeding violations
7. Modified the treatment of generic speeding violations
8. Changed the name of the Fatigued Driving (HOS) BASIC to the HOS Compliance BASIC

Below is detailed information regarding the feedback, analysis, and implementation approach for each of these enhancements.

1. Moved load securement violations into the Vehicle Maintenance BASIC

a. Feedback Received: Industry and enforcement stakeholders have pointed out that carriers that predominantly haul open trailers (e.g., flatbeds) have excessively high Cargo-Related BASIC percentiles, as load securement issues for these types of carriers are more apparent.

b. Analysis Conducted: The analysis showed that this approach (1) identifies carriers with a higher crash risk for CSA interventions and (2) effectively addresses the bias associated with carriers that haul open trailers while still holding all carriers accountable for all cargo securement violations.

c. Solution: FMCSA moved the cargo/load securement violations from the Cargo-Related BASIC to the Vehicle Maintenance BASIC.

2. Changed the Cargo-Related BASIC to the Hazardous Materials (HM) Compliance BASIC to better identify HM-related safety problems.

a. Feedback Received: Stakeholders have asked FMCSA to review the SMS methodology to ensure HM safety problems are adequately identified and addressed. The specific concern was that because the Cargo-Related BASIC included HM violations and load securement violations, some HM safety issues could have been masked.

b. Analysis Conducted: FMCSA consulted subject matter experts to identify and apply severity weightings to the 239 HM violations contained in the Cargo-Related BASIC and 112 additional HM safety-based violations attributable to the motor carrier. The analysis found that the new BASIC identified carriers with more future violations and with higher violation rates than the current Cargo-Related BASIC.

c. Solution: The Agency created a new HM Compliance BASIC that includes only HM-related violations from inspections where placardable quantities of HM were being transported.

3. Removed vehicle violations from driver-only inspections and driver violations from vehicle-only inspections

a. Feedback Received: The SMS version 2.2 and earlier included driver-only (Level 3) inspections in the Vehicle Maintenance BASIC only when vehicle violations were noted on the inspection.

Industry and enforcement were concerned that many vehicle violations fall outside the scope of the inspection and could bias the Vehicle Maintenance BASIC data.

b. Analysis Conducted: Approximately 139,000 violations, or 2.6% of all vehicle violations used in the SMS, are vehicle violations cited during a driver-only inspection. While very few driver violations are ever documented in vehicle-only inspections, this change will also be made to ensure that only violations within the scope of a particular type of inspection are included in the SMS.

c. Solution: SMS removes vehicle violations found during driver-only inspections and driver violations found during vehicle-only inspections to align the SMS with existing CVSA policies regarding inspection levels.

4. Better aligned the SMS with IEP regulations

a. Feedback Received: Violations that should be found during the pre-trip inspection are the responsibility of the motor carrier and thus should be applied in the SMS.

b. Analysis Conducted: FMCSA conducted a collaborative effort between law enforcement officials and industry to identify the violations that can be found during a pre-trip inspection of an IEP trailer.

c. Solution: Violations that could be found from a carrier's driver performing a pre-trip inspection are now applied to the motor carrier SMS results.

5. Aligned EOBRs to paper equivalent

a. Feedback Received: In the previous SMS, Hours-of-Service form and manner violations have different weights for paper (weight of 2) and electronic form and manner logbook (weight of 1) violations.

b. Solution: Aligned EOBR violation to their paper equivalent by:

(1) Reducing the severity weight of the 'Other form and manner' group from 2 to 1, to match the EOBR equivalent violations

(2) Moving onboard recording form and manner violations to the 'Other form and manner' group with a weight of 1, and

(3) Increasing the severity of onboard recording device failures to a weight of 5 to match the 'Incomplete/Wrong log' paper equivalent.

A table of these changes is presented below.

Table B–3. Modified EOBR/Form and Manner Violation Group and Severity Weights

BASIC	Section	Violation Description	Old Violation Group	SMS 2.2 Severity Weight	New Violation Group	SMS 3.0 Severity Weight
HOS	395.8	Log violation (general/form and manner)	Other Log/ Form & Manner	2	Other Log/ Form & Manner	1
HOS	395.15(b)	Onboard recording device information requirements not met	EOBR Related	1	Incomplete/ Wrong Log	5
HOS	395.15(c)	Onboard recording device improper form and manner	EOBR Related	1	Other Log/ Form & Manner	1
HOS	395.15(f)	Onboard recording device failure and driver failure to reconstruct duty status	EOBR Related	1	Incomplete/ Wrong Log	5
HOS	395.15(g)	On-board recording device information not available	EOBR Related	1	EOBR Related	1
HOS	395.15(i)(5)	Onboard recording device does not display required information	EOBR Related	1	Other Log/ Form & Manner	1

6. Modified the treatment of 1-5 speeding violations

a. Feedback received: In version 2.2 and earlier of SMS, the Unsafe Driving BASIC used all speeding violations regardless of the range exceeding the speed limit even violations of 1 to 5 mph over the speed limit. Speedometer regulations (49 CFR 393.82), however, only require accuracy within 5 mph.

b. Solution: To better align SMS with the speedometer regulations, commercial motor vehicle speeding violations in the 1 to 5 mph over the speed limit range (392.2-SLLS1) were removed from the SMS, regardless of when the inspection occurred. This change applies to the prior 24 months of data used by the SMS and all the SMS data moving forward.

7. Modified the treatment of generic speeding violations

a. Feedback received: In version 2.2 and earlier of SMS, the Unsafe Driving BASIC applied a severity weight of 5 to general speeding violations (i.e., 392.2S) that did not specify the range exceeding the speed limit. By January 1, 2011 many of the inspectors had access to updated roadside inspection software, ASPEN, to record violations broken out by mph categories above the speed limit. It was possible to have a higher severity weight assigned to the

generic speeding violation of 5 for 392.2S, than if the inspector denoted a more specified speed violation such as 392.2-SLLS2 (speeding 6-10 miles per hour over the speed limit) with a severity weight of 4.

b. Solution: Therefore, the severity weight of all generic (392.2S) speeding violations from on or after January 1, 2011 has been decreased from 5 to 1. Generic speeding violations from before January 1, 2011 will still be treated with a weight of 5.

8. Changed the name of the Fatigued Driving (HOS) BASIC to the HOS Compliance BASIC

a. Feedback received: Version 2.2 and earlier of SMS had a Fatigued Driving (HOS) BASIC. This BASIC included violations such as "form and manner" and "logbook not current" that, by themselves, do not necessarily indicate fatigued driving or driving in excess of allowable hours.

b. Solution: The BASIC name was changed to Hours-of-Service (HOS) Compliance BASIC to more accurately indicate what behavior is being measured.

SMS Methodology Document Changes ONLY (Updated February 2013)

1. Modified language to clarify what type of inspections are used in the calculation of each BASIC.
2. Added notation to violations clarifying when lower severity weight went into effect.
3. Fixed pagination between sections.

SMS Methodology Document Changes (Updated April 2013)

Ten obsolete violations were removed as the referencing regulations no longer exist. Twelve violation descriptions were modified to more accurately reflect the safety problem. See the tab, "Violation Changes_04_2013" in Appendix A (https://csa.fmcsa.dot.gov/documents/SMS_AppendixA_ViolationList.xlsx), for the list of removed and modified violations.

SMS Methodology Changes from Version 3.0 to 3.0.1 (Implemented August 2013)

FMCSA has added two new violations to the SMS. One of the violations is based on the new Hours-of-Service (HOS) regulations and the other is based on a more detailed description of existing controlled substances and alcohol regulations. Both of these violations were implemented on July 1, 2013 and therefore will count in the SMS as of this date.

The table below includes descriptions of the new violations, the BASICs they relate to, and how they are weighted in the SMS.

Table B–4. BASIC Violations Added to the SMS

BASIC	Violation Code	Description	Severity Weight	Violation Group	Driver-Related (Y/N)
HOS Compliance	395.3(a)(3)(ii)	Driving beyond 8-hour limit since the end of the last off-duty or sleeper period of at least 30 minutes	7	Hours	Y
Controlled Substances /Alcohol	392.5(a)(3)	Driver in possession of intoxicating beverage while on duty or driving	3	Alcohol Possession	Y

The new violation related to the HOS Compliance BASIC reflects FMCSA's HOS regulation that requires drivers to take a 30-minute rest break during the first eight hours of a shift. This new regulation and guidance can be found at http://www.fmcsa.dot.gov/rules-regulations/topics/hos/index.htm.

The new violation related to the Controlled/Substances Alcohol BASIC was added based on industry and law enforcement feedback. The inclusion of this violation enables roadside inspectors to distinguish between alcohol possession and alcohol use. The distinction allows the SMS to assign a lower severity weight to alcohol possession.

SMS Methodology Changes from Version 3.0.1 to 3.0.2 (Implemented June 2014)

Several new violations were added to the roadside inspection collection software on April 1, 2014. These new violation codes provide a more detailed explanation of the conditions resulting in the violation. As of the May 2014 snapshot, these violations are being added to the SMS. The table below includes descriptions of the new violations, the BASICs they relate to, and how they are weighted in the SMS.

Table B–5. BASIC Violations Added to the SMS

BASIC	Violation Code	Description	Violation Group Description	Severity Weight	Driver-Related (Y/N)
Driver Fitness	390.35B-MED	Operating a CMV while possessing a fraudulent medical certificate	Fraud	10	Y
Unsafe Driving	392.11	Commercial Vehicle failing to slow down approaching a railroad crossing.	Dangerous Driving	5	Y
Vehicle Maintenance	396.3A1DSCB	Center Bearing (Carrier Bearing) Cracked / Loose / Broken / Missing	Other Vehicle Defect	3	N
Vehicle Maintenance	396.3A1DSDT	Drive Shaft Tube Cracked or Twisted	Other Vehicle Defect	3	N
Vehicle Maintenance	396.3A1DSUJ	Universal Joint Loose / Broken / Missing Component	Other Vehicle Defect	3	N
Vehicle Maintenance	396.3A1DSYE	Drive Shaft Yoke Ends Cracked / Loose / Broken / Missing	Other Vehicle Defect	3	N

In addition, 22 violation descriptions have been modified to accurately reflect the current descriptions in the roadside inspection collection software. These changes do not affect how carriers are being assessed in SMS.

SMS Methodology Changes from Version 3.0.2 to 3.0.3 (Implemented September 2014)

FMCSA updated SMS in Version 3.03 to accommodate FMCSA's Adjudicated Citations Policy, which became effective August 23, 2014, for inspections that occurred on or after that date. The changes impact the use of certain violations in SMS when States issue a citation (i.e., ticket) associated with a violation noted in the roadside inspection, and such citations is subsequently adjudicated in a due process system. With this policy, FMCSA is taking important steps toward improving the quality and uniformity of roadside inspection violation data in the Agency's data systems. The policy allows the States to reflect the results of adjudicated citations related to roadside inspection violation data collected in the Motor Carrier Management Information System (MCMIS).

Drivers or carriers must submit certified documentation of the judicial proceeding results through a Request for Data Review (RDR) in FMCSA's DataQs system to initiate this process. MCMIS has been modified to accept adjudication results showing that a citation was dismissed or resulted in a finding of not guilty; resulted in a conviction of a different charge; or, resulted in conviction of the original charge. The adjudication results will impact the use of roadside inspection violation data in other FMCSA data systems, including the SMS.

Table B–6. Impact of Adjudicated Citation Result on Violation in SMS

Citation Result for a Violation	Violation in SMS
Dismissed/Not guilty	Remove violation
Convicted of a different charge	Severity weight set to 1 and not subject to OOS weight

SMS Methodology Changes from Version 3.0.3 to 3.0.4 (Implemented August 2015)

FMCSA updated Version 3.0.4 of the SMS to improve the consistency of Serious Violation and roadside violation data in its data systems. This update includes:

- Removing 20 Serious Violations and changing the classification of one Serious Violation to align with the list of Serious Violations that includes violations of the Acute and Critical Regulations used in the Safety Fitness Procedures, as outlined in Appendix B of Part 385. Since SMS's inception, Serious Violations have been and continue to be factored into a carrier's prioritization status. This new methodology document simply centralizes the latest Serious Violation information that was previously available on multiple FMCSA Websites.
- Adding 81 roadside inspection violations and updating the descriptions of four violations to align with our roadside inspection collection software.

These violation updates took effect in the SMS with the August 28, 2015 snapshot. See the Appendix A spreadsheet for a complete list of these updates.

SMS Methodology Changes from Version 3.0.4 to 3.0.5 (Implemented September 2015)
FMCSA updated Version 3.0.5 of the SMS to include two roadside inspection violations related to the Unsafe Driving BASIC. The table below includes descriptions of the new violations and how they are weighted in the SMS. These violations can also be found in the Appendix A spreadsheet.

Table B–7. Unsafe Driving BASIC Violations Added to the SMS

Section	Violation Description Shown on Driver/Vehicle Examination Report Given to CMV Driver after Roadside Inspection	Violation Group Description	Violation Severity Weight	Violation in the DSMS (Y/N)
392.2-INAT	Inattentive Driving	Dangerous Driving	5	Y
392.2-ML	Failure to Maintain Lane	Dangerous Driving	5	Y

These violations took effect in the SMS with the September 25, 2015 snapshot. This update aligns with recent changes the Agency's roadside inspection collection software and builds upon efforts to improve the consistency of data in its systems.

SMS Methodology Document Changes (Updated February 2016)
FMCSA updated the SMS Methodology document to align with the Acute and Critical Violation language used in its Federal regulations and IT systems. The Agency replaced references to Serious Violations with Acute and Critical Violations throughout the document. References to Serious Violations in Appendix B were maintained for historical accuracy.

SMS Methodology Changes from Version 3.0.6 to 3.0.7 (Implemented April 2017)
FMCSA updated the SMS Methodology document with the following improvements:

- Moving Critical Violation 177.800(c) from the Driver Fitness to the HM Compliance BASIC to more accurately identify safety problems related to HM training; and
- Updating violation descriptions in the SMS to better align with Aspen.

FMCSA also added a brakes OOS violation, also known as cite 396.3A1BOS, to the SMS. The brakes OOS violation differs from other violations in the SMS. The brakes OOS violation relates directly to underlying brake violations that are already used in the SMS. It signifies an OOS condition based on the underlying violations noted under other cites. When these underlying brake violations indicate that 20% or more of the total brakes are defective, 396.3A1BOS is cited and recorded as an OOS violation. The brakes OOS violation provides carriers and Safety Investigators with a clearer picture of the brake issues that lead to an OOS condition. The brakes OOS violation took effect in the SMS as of April 1, 2017 and was not implemented retroactively. Violations cited before April 1 are not used. The other changes listed above also took effect in the SMS with the April 27, 2017 snapshot. The tables below provide descriptions of the violations and how they are weighted in SMS. These violations can also be found in the Appendix A spreadsheet.

Table B–8. Vehicle Maintenance BASIC Violation Added to the SMS

Section	Violation Description Shown on Driver/Vehicle Examination Report Given to CMV Driver after Roadside Inspection	Violation Group Description	Violation Severity Weight	Violation in the DSMS (Y/N)
396.3A1BOS	BRAKES OUT OF SERVICE: The number of defective brakes is equal to or greater than 20% of the service brakes on the vehicle or combination	Brakes, All Others	0 + 2 (OOS)	N

Table B–9. Critical Violation Moved from Driver Fitness to HM Compliance BASIC

Section	Violation Description Shown on Investigation Report Given to Carrier after Investigation	Violation Type
177.800(c)	Failing to train Hazardous Materials employees as required	Critical Violation

SMS Methodology Changes from Version 3.0.7 to 3.0.8 (Implemented July 2017)

FMCSA updated Version 3.0.8 of the SMS to include 12 violations. This update aligns with recent changes to FMCSA's roadside inspection collection software and builds on efforts to improve the consistency of data in the Agency's systems. These violations were applied retroactively in SMS with the July 28, 2017 snapshot. However, prior SMS results will not be modified based on the addition of new violations.

The tables below provide descriptions of the violations and how they are weighted in SMS. These violations can also be found in the Appendix A spreadsheet.

Table B–10. BASIC Violations Added to the SMS

BASIC	Section	Violation Description Shown on Driver/Vehicle Examination Report Given to CMV Driver after Roadside Inspection	Violation Group Description	Violation Severity Weight	Violation in the DSMS (Y/N)
Unsafe Driving	392.16B	Operating a property-carrying commercial motor vehicle while all other occupants are not properly restrained.	Seat Belt	7	Y
Vehicle Maintenance	393.75B-OOS	Tire-front tread depth less than 2/32 of inch on a major tread groove	Tires	8	Y
Vehicle Maintenance	393.75C-OOS	Tire-other tread depth less than 1/32 of inch measured in 2 adjacent major tread grooves	Tires	8	Y
Vehicle Maintenance	393.75F-SPEED	Operating a CMV at speeds exceeding the speed-restriction label of the tire.	Tires	8	Y
Vehicle Maintenance	393.75G-LOAD	Weight carried exceeds tire load limit	Tire vs. Load	3	Y
Vehicle Maintenance	393.75I1	Operating a CMV while weight carried exceeds tire rating due to under-inflation	Tire vs. Load	3	Y

Table B–10. BASIC Violations Added to the SMS

BASIC	Section	Violation Description Shown on Driver/Vehicle Examination Report Given to CMV Driver after Roadside Inspection	Violation Group Description	Violation Severity Weight	Violation in the DSMS (Y/N)
Controlled Substances/Alcohol	392.4A-POS	Driver on duty and in possession of a narcotic drug / amphetamine	Drugs	10	Y
Controlled Substances/Alcohol	392.4A-UI	Driver on duty and under the influence of, or using a narcotic drug / amphetamine, which renders the driver incapable of safe operation.	Drugs	10	Y
Controlled Substances/Alcohol	392.5A2-DETECT	Driver having any measured alcohol concentration, or any detected presence of alcohol while on duty, or operating, or in physical control of a CMV	Alcohol	5	Y
Controlled Substances/Alcohol	392.5A2-POS	Driver having possession of alcohol while on duty, or operating, or in physical control of a CMV	Alcohol Possession	3	Y
Controlled Substances/Alcohol	392.5A2-UI	Operating a CMV while under the influence of an intoxicating beverage regardless of its alcohol content.	Alcohol	5	Y
HM Compliance	180.3	Represent a package as meeting a specification that does not meet a specification	Package Integrity – HM	8	N

SMS Methodology Changes from Version 3.0.8 to 3.0.9 – Electronic Logging Device (ELD) Violations (Implemented April 2018)

FMCSA updated Version 3.0.9 of the SMS to include violations related to ELDs found during roadside inspections. These violations took effect as of April 1, 2018 in the SMS. Violations cited prior to April 1, 2018 will not be counted in SMS.

The tables below provide descriptions of the ELD violations and how they are weighted in SMS. These violations can also be found in the SMS Appendix A spreadsheet.

Table B–11. ELD Violations Added to the HOS Compliance BASIC

Section	Violation Description Shown on Driver/Vehicle Examination Report Given to CMV Driver after Roadside Inspection	Violation Group Description	Violation Severity Weight	Violation in the DSMS (Y/N)
395.8A-ELD	ELD - No record of duty status (ELD Required)	Incomplete/Wrong Log	5	Y
395.8A-NON-ELD	No record of duty status when one is required (ELD Not Required)	Incomplete/Wrong Log	5	Y
395.8A1	Not using the appropriate method to record hours of service	Incomplete/Wrong Log	5	Y
395.11G	Failing to provide supporting documents in the driver's possession upon request	False Log	7	Y
395.20B	The ELD's display screen cannot be viewed outside of the commercial motor vehicle.	Incomplete/Wrong Log	5	N
395.22A	Operating with a device that is not registered with FMCSA	Incomplete/Wrong Log	5	Y
395.22G	Portable ELD not mounted in a fixed position and visible to driver	EOBR-Related	1	Y
395.22H1	Driver failing to maintain ELD user's manual	EOBR-Related	1	Y
395.22H2	Driver failing to maintain ELD instruction sheet	EOBR-Related	1	Y
395.22H3	Driver failed to maintain instruction sheet for ELD malfunction reporting requirements	EOBR-Related	1	Y

Table B–11. ELD Violations Added to the HOS Compliance BASIC

Section	Violation Description Shown on Driver/Vehicle Examination Report Given to CMV Driver after Roadside Inspection	Violation Group Description	Violation Severity Weight	Violation in the DSMS (Y/N)
395.22H4	Driver failed to maintain supply of blank driver's records of duty status graph-grids	EOBR-Related	1	Y
395.24C1I	Driver failed to make annotations when applicable	Other Log/Form & Manner	1	Y
395.24C1II	Driver failed to manually add location description	Other Log/Form & Manner	1	Y
395.24C1III	Driver failed to add file comment per safety officer's request	Other Log/Form & Manner	1	Y
395.24C2I	Driver failed to manually add CMV power unit number	Other Log/Form & Manner	1	Y
395.24C2II	Driver failed to manually add the trailer number	Other Log/Form & Manner	1	Y
395.24C2III	Driver failed to manually add shipping document number	Other Log/Form & Manner	1	Y
395.28	Driver failed to select/deselect or annotate a special driving category or exempt status	Other Log/Form & Manner	1	Y
395.30B1	Driver failed to certify the accuracy of the information gathered by the ELD	Other Log/Form & Manner	1	Y
395.30C	Failing to follow the prompts from the ELD when editing/adding missing information	Other Log/Form & Manner	1	Y
395.32B	Driver failed to assume or decline unassigned driving time	Incomplete/Wrong Log	5	Y
395.34A1	Failing to note malfunction that requires use of paper log	Incomplete/Wrong Log	5	Y

SMS Methodology Changes from Version 3.0.8 to 3.0.9 – Additional Violation Changes

FMCSA also updated Version 3.0.9 of the methodology to incorporate additional violation changes to align SMS with FMCSA's roadside inspection collection software, including: removing 30 violations; updating the descriptions of 20 violations; and adding 25 violations. Unlike the ELD violations, the 25 violations that were added are being applied retroactively (i.e., any of these violations recorded in the 24-month SMS timeframe will be used to calculate SMS results).

The tables below provide descriptions of the violations added and how they are weighted in SMS. More information on all of the violation changes listed above can be found in the SMS Appendix A spreadsheet.

Table B–12. BASIC Violations Added to the SMS

BASIC	Section	Violation Description Shown on Driver/Vehicle Examination Report Given to CMV Driver after Roadside Inspection	Violation Group Description	Violation Severity Weight	Violation in the DSMS (Y/N)
Vehicle Maintenance	392.64	Riding within the closed body of a commercial vehicle without exits	Towing Loaded Bus	10	Y
Vehicle Maintenance	393.71B3	Improper weight distribution drive-away/towaway	Coupling Devices	3	Y
Vehicle Maintenance	393.9BRKLAMP	Inoperative Brake Lamps	Lighting	6	Y
Vehicle Maintenance	393.45A-AJS	Air Brake tubing improperly joined or spliced	Breaks, All Others	4	N
HM Compliance	171.12AB	US requirements for TDG shipment	HM Other	2	N
HM Compliance	171.12B	Failure to comply with US requirements for shipments from Mexico	HM Other	2	N
HM Compliance	172.310C	Type B, B(U), B(M) package not marked with radiation symbol	Markings - HM	5	N
HM Compliance	172.326D	No NON-ODORIZED entry for LPG Portable Tanks	Documentation - HM	3	N

Table B–12. BASIC Violations Added to the SMS

BASIC	Section	Violation Description Shown on Driver/Vehicle Examination Report Given to CMV Driver after Roadside Inspection	Violation Group Description	Violation Severity Weight	Violation in the DSMS (Y/N)
HM Compliance	172.328E	Fail to mark "Non Odorized LPG" on cargo tank	Documentation - HM	3	N
HM Compliance	172.330C	No NON-ODORIZED entry for LPG on tank cars	Documentation - HM	3	N
HM Compliance	172.604	Offering HM for transportation with no or improper Emergency Response telephone number	Documentation - HM	3	N
HM Compliance	173.9B	Failed to warn of fumigated load	Markings - HM	5	N
HM Compliance	173.427D	Not packaged in accordance with 10 CFR, Part 71	Package Integrity - HM	8	N
HM Compliance	173.441C	Failure to provide Exclusive Use instructions to carrier	Cargo Protection - HM	4	Y
HM Compliance	177.804A	Failure to comply with FMCSR 49 CFR Parts 390 through 397 When Transporting HM	HM Other	2	Y
HM Compliance	177.804A-CDL	Failure to comply with 49 CFR Part 383 Commercial Drivers License Provisions When Transporting HM	HM Other	2	Y

Table B–12. BASIC Violations Added to the SMS

BASIC	Section	Violation Description Shown on Driver/Vehicle Examination Report Given to CMV Driver after Roadside Inspection	Violation Group Description	Violation Severity Weight	Violation in the DSMS (Y/N)
HM Compliance	177.840L	No or improper Emergency Operating Procedures for cargo tanks	Documentation - HM	3	Y
HM Compliance	177.870	Prohibited Hazardous Materials on passenger carrying vehicle	Load Securement - HM	10	N
HM Compliance	178.253	DOT57 Portable Tank Specifications	Package Integrity - HM	8	N
HM Compliance	178.255-8	DOT60 pressure relief	Package Integrity - HM	8	N
HM Compliance	178.338-10D	MC338 Minimum Ground Clearance	Package Integrity - HM	8	N
HM Compliance	178.338-11C	Missing or Defective Thermal and Mechanical Remote Closure Device	Package Integrity - HM	8	Y
HM Compliance	178.910	Failure to comply with Large Packaging Marking specifications	Markings - HM	5	N
HM Compliance	178.1010	No or improper marking of Flexible Bulk Containers	Markings - HM	5	N
HM Compliance	180.407B	Fail to test/inspect a specification cargo tank when damaged	Package Testing - HM	7	N

SMS Methodology Changes from Version 3.0.9 to 3.10 (Implemented February 2019)

FMCSA updated Version 3.10 of the methodology to incorporate Acute and Critical violation changes to further align SMS with FMCSA's roadside inspection collection software and other systems. The changes include adding 11 violations, removing 6 violations, and changing 1 violation from Critical to Acute. These changes took effect in the SMS with the February 22, 2019 snapshot. In addition, FMCSA updated the Y/N flags in the "Violation in the DSMS" column for the Vehicle Maintenance BASIC to align with current IEP policy.

The tables below outline the descriptions of the Acute and Critical Violation changes. More information is available in the SMS Appendix A spreadsheet.

Table B–13. Acute/Critical Violations Added to the SMS

BASIC	Section	Violation Description Shown on Investigation Report Given to Carrier after Investigation	Violation Type
HOS Compliance	395.3(c)(1)	Requiring or permitting a property-carrying commercial motor vehicle driver to restart a period of 7 consecutive days without taking an off-duty period of 34 or more consecutive hours	Critical Violation
HOS Compliance	395.3(c)(2)	Requiring or permitting a property-carrying commercial motor vehicle driver to restart a period of 8 consecutive days without taking an off-duty period of 34 or more consecutive hours	Critical Violation
HOS Compliance	395.8(a)(1)(i)	Carrier failed to install and/or require driver to record the driver's duty status using an ELD	Critical Violation
HOS Compliance	395.8(a)(2)	Driver failed to create a record of duty status	Critical Violation
HOS Compliance	395.8(a)(2)(i)	Driver failed to record driver's record of duty status on an Electronic Logging Device	Critical Violation

Table B–13. Acute and Critical Violations Added to the SMS

BASIC	Section	Violation Description Shown on Investigation Report Given to Carrier after Investigation	Violation Type
HM Compliance	173.441	Accepting for transportation or transporting a package containing Class 7 (radioactive) material with external radiation exceeding 2 MSV/hour (200 MREM/hour), and the transport index exceeds 10	Acute Violation
HM Compliance	180.3(a)	No person may accept for transportation or transport by motor vehicle a forbidden material or hazardous material that is not prepared in accordance with the requirements of this subchapter.	Acute Violation
HM Compliance	180.407(a)(2)	Subjecting a cargo tank to a pressure greater than its design pressure or maximum allowable working pressure (MAWP)	Critical Violation
HM Compliance	180.407(a)(3)	Performing or witnessing a test or inspection on a cargo tank without meeting the minimum qualifications prescribed in 180.409	Critical Violation
HM Compliance	180.407(a)(4)	Each cargo tank must be evaluated in accordance with the acceptable results of tests and inspections prescribed in §180.411	Critical Violation
HM Compliance	180.407(a)(5)	Failing to mark a cargo tank which has successfully passed a test or inspection as per 180.415	Critical Violation

Table B–14. Acute and Critical Violations Removed from the SMS

BASIC	Section	Violation Description Shown on Investigation Report Given to Carrier after Investigation	Violation Type
HOS Compliance	395.8(i)	Failing to require driver to forward within 13 days of completion, the original of the record of duty status	Critical Violation
Controlled Substances/Alcohol	382.605(c)(1)	Using a driver who has not undergone a return-to-duty alcohol test with a result indicating an alcohol concentration of less than .02 or with verified negative test result, after engaging in conduct prohibited by Part 382 Subpart B	Acute Violation
Controlled Substances/Alcohol	382.605(c)(2)(ii)	Failing to subject a driver who has been identified as needing assistance to at least six unannounced follow-up alcohol and/or controlled substance tests in the first 12 months following the driver's return to duty	Critical Violation
HM Compliance	173.421(a)	Accepting for transportation or transporting a Class 7 (radioactive) material described, marked, and packaged as a limited quantity when the radiation level on the surface of the package exceeds the limits of Table 4 in Section 173.425	Acute Violation
HM Compliance	173.441(a)	Accepting for transportation or transporting a package containing Class 7 (radioactive) material with external radiation exceeding 2 MSV/hour (200 MREM/hour), and the transport index exceeds 10	Acute Violation
HM Compliance	397.101(d)	Failing to prepare a written route plan before requiring or permitting the operation of a motor vehicle containing highway route controlled quantity of Class 7 (radioactive) material	Critical Violation

Table B–15. Violation Changed from Critical to Acute in SMS

BASIC	Section	Violation Description Shown on Investigation Report Given to Carrier after Investigation	Violation Type
HOS Compliance	395.8(e)(2)	Disabling, deactivating, disengaging, jamming, or otherwise blocking or degrading a signal transmission or reception; tampering with an automatic on-board recording device	Acute Violation

Crash Preventability Determination Program Results Integrated into SMS (Implemented June 2020)

With the May 29, 2020 snapshot, SMS began integrating results from the FMCSA's Crash Preventability Determination Program (CPDP). Crashes found to be not preventable by the CPDP will be listed on the SMS Website as "Reviewed – Not Preventable," but excluded from a carrier's measure and percentile in the Crash Indicator BASIC. More information is available on the CPDP Website.

SMS Methodology Changes from Version 3.10 to 3.11 (Implemented September 2020)

FMCSA updated Version 3.11 of the methodology to align SMS with the latest changes to violations recorded as part of the roadside inspection program. The changes included adding 63 violations, removing 4 violations, and updating the descriptions of 34 violations. These changes took effect in the SMS with the September 25, 2020 snapshot. For a complete list of the violation changes, see the SMS Appendix A spreadsheet.

SMS Methodology Changes from Version 3.11 to 3.12 (Implemented August 2021)

FMCSA updated Version 3.12 of the methodology to align SMS with the latest changes to violations recorded as part of the roadside inspection program. The changes included adding one violation and removing one violation from SMS. These changes took effect in the SMS with the August 27, 2021 snapshot. More details on these violation changes are available in the SMS Appendix A spreadsheet.

SMS Methodology Changes from Version 3.12 to 3.13 (Implemented December 2021)

FMCSA updated Version 3.13 of the methodology to align SMS with the latest changes to violations recorded as part of the roadside inspection program. FMCSA added Other Log/Form & Manner violation 395.22(b)(2)(ii) to the HOS Compliance BASIC. This violation took effect in the SMS with the December 31, 2021 snapshot. For more information, see the SMS Appendix A spreadsheet.

SMS Methodology Changes from Version 3.13 to 3.14 (Implemented December 2022)

FMCSA updated Version 3.14 of the methodology to align SMS with the latest changes to violations recorded as part of the roadside inspection program. These changes included:

- Adding Critical Violation 391.51(b)(6) to the Driver Fitness BASIC;
- Removing Critical Violation 391.51(b)(7) from the Driver Fitness BASIC; and
- Adding ELD violation 395.24(d) to the HOS Compliance BASIC.

For more information on the changes, see the SMS Appendix A spreadsheet.

SMS Methodology Changes from Version 3.14 to 3.15 (Implemented March 2023)

FMCSA updated Version 3.15 of the methodology to align SMS with the latest changes to violations recorded as part of the roadside inspection program. FMCSA has released new software used to record violations found during roadside inspections. This software often uses different violation codes from existing software. To account for these new violation codes, SMS has incorporated violations cited under these new codes that were discovered on and after February 1, 2023. Only violations cited on or after February 1 are included in SMS calculations. For more details and a complete list of violations, see the SMS Appendix A spreadsheet.

SMS Methodology Changes from Version 3.15 to 3.16 (Implemented October 2023)

FMCSA updated Version 3.16 of the methodology to align SMS with the latest changes to violations recorded as part of the roadside inspection program and during investigations. These changes included adding the following violations to SMS:

- Violation 392.16BDPASS (Unsafe Driving)
- Violation 395.24 (HOS Compliance)
- Violation 393.9ALTSIR (Vehicle Maintenance)
- Violation 393.45B2B (Vehicle Maintenance)
- Violation 391.45BMCEM (Driver Fitness)
- Critical Violation 391.45(b) (Driver Fitness)

For more details and a complete list of violations, see the SMS Appendix A spreadsheet.

SMS Methodology Changes from Version 3.16 to 3.17 (Implemented February 2024)

FMCSA updated Version 3.17 of the methodology to align SMS with the latest changes to violations recorded as part of the roadside inspection program and during investigations. These changes included moving 13 Vehicle Maintenance violations from the Lighting violation group to Clearance Identification Lamps/Other violation group as of the February 23, 2024 snapshot.

For more details and a complete list of violations, see the SMS Appendix A spreadsheet.

SMS Methodology Changes from Version 3.17 to 3.18 (Implemented May 2024)

FMCSA updated Version 3.18 of the methodology to align SMS with the latest changes to violations recorded as part of the roadside inspection program and during investigations. With this update, FMCSA added violation 392.15 to the Controlled Substances/Alcohol BASIC. This violation addresses "driver[s] prohibited from performing safety sensitive functions per 382.501(a) in the Drug and Alcohol Clearinghouse."

For more details and a complete list of violations, see the SMS Appendix A spreadsheet.

SMS Methodology Changes from Version 3.18 to 3.19 (Implemented September 2024)

FMCSA updated Version 3.19 of the methodology to align SMS with the latest changes to violations recorded as part of the roadside inspection program. Changes included adding more than 30 violation codes and updating descriptions of some of the existing violation codes in the SMS.

For more details and a complete list of violations, see the SMS Appendix A spreadsheet.

SMS Methodology Changes from Version 3.19 to 3.20 (Implemented July 2025)

FMCSA updated Version 3.20 of the methodology to align SMS with the latest changes to violations recorded as part of the roadside inspection program. Changes included:

- Adding 37 violations.
- Updating the descriptions of two English language proficiency violations.
- Moving violation 395.AB from the Incomplete/Wrong Log group to the Other Log/Form & Manner group. *This change took effect with the September 27, 2024 snapshot. Violations cited on or after September 1, 2023 are classified in the Other Log/Form & Manner group which has a severity weight of 1. Violations cited before September 1, 2023 are classified in the Incomplete/Wrong Log group with a severity weight of 5.*
- Carriers with excessively high Unsafe Driving measures of 250 or greater are removed from the percentile ranking and are assigned the maximum percentile of 100. This prevents carriers with erroneous data from biasing the remaining carriers in the Safety Event Group ranking process.

For more details and a complete list of violations, see the SMS Appendix A spreadsheet.