



Compliance, Safety, Accountability (CSA)

Safety Measurement System Effectiveness Transportation Research Board (TRB)

January 2013





CSA – Three Major Elements

1. New Safety Measurement System (SMS)

- Better targets carriers for Agency interventions

2. Broader array of interventions

- Includes warning letters and focused on and off-site investigations to augment the full investigations

3. Planned revisions to Safety Fitness Determination (SFD) Regulations

- To incorporate on-road performance into SFD methodology





Safety Measurement System

- Replaced the SafeStat system as the FMCSA tool to identify carriers for intervention
- Reviews regulatory compliance and identifies unsafe carrier and driver behaviors that lead to crashes
- Uses all safety-based roadside inspection violations
 - ~3.5 million inspections per year
 - Vast majority of inspections conducted by States
 - Funded by FMCSA
- Results updated monthly based on prior 24 months of history
 - <http://ai.fmca.dot.gov/sms>





Safety Measurement System

Behavior Analysis Safety Improvement Categories (BASICS)

- Unsafe Driving
- Hours of Service Compliance
- Driver Fitness
- Controlled Substances and Alcohol
- Vehicle Maintenance
- HM Compliance
- Crash





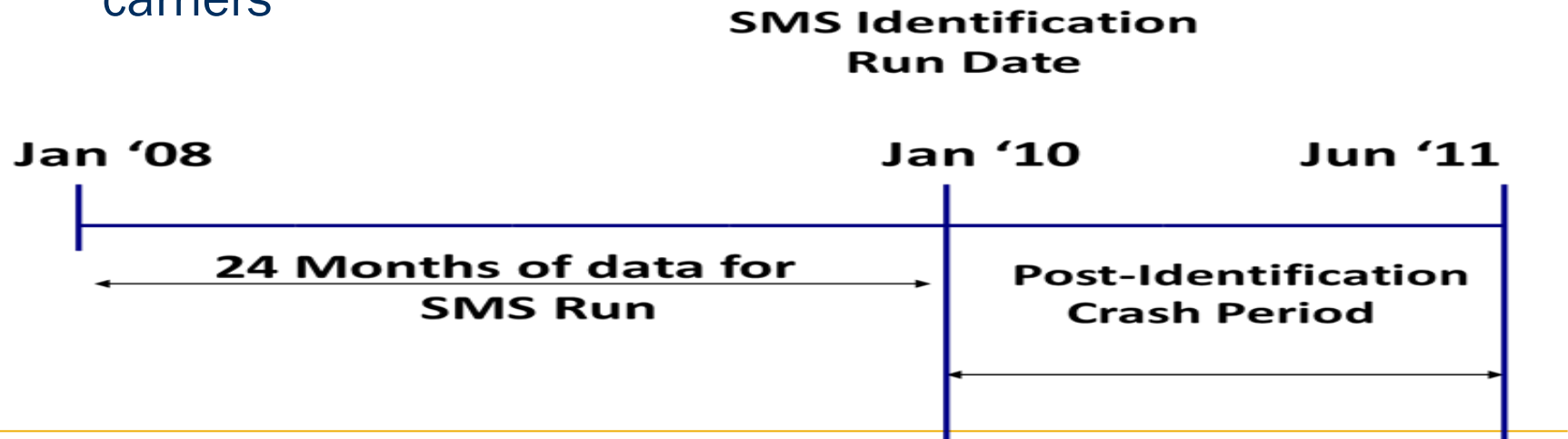
Safety Measurement System Effectiveness Testing





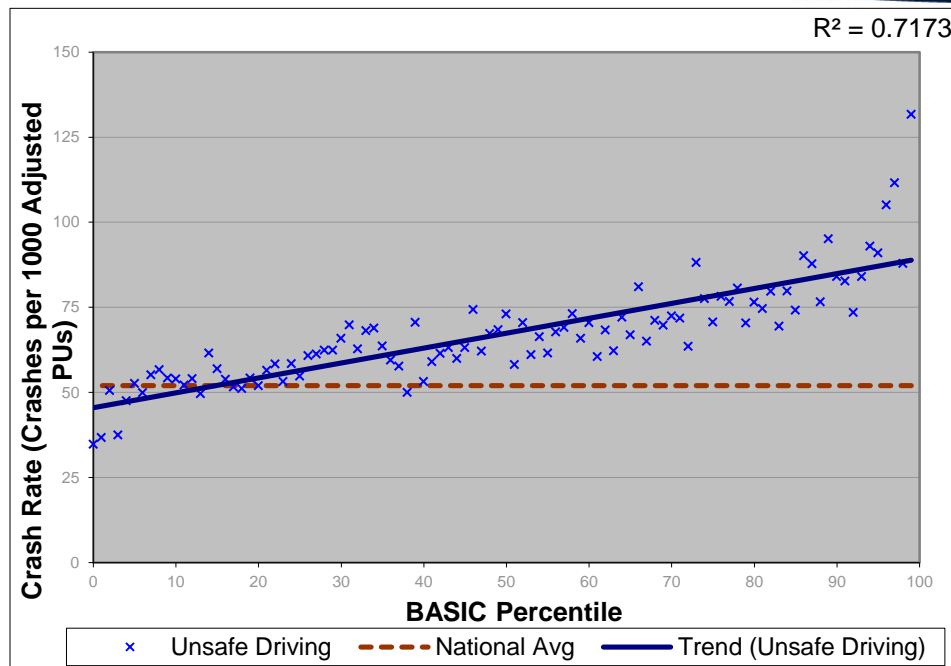
FMCSA SMS Effectiveness Testing

- **Objective**
 - Quantify how effectively the SMS identifies high-risk motor carriers
- **Methodology**
 - Use historical data to examine the future crash rate of motor carriers





FMCSA SMS Effectiveness Testing: Unsafe Driving BASIC

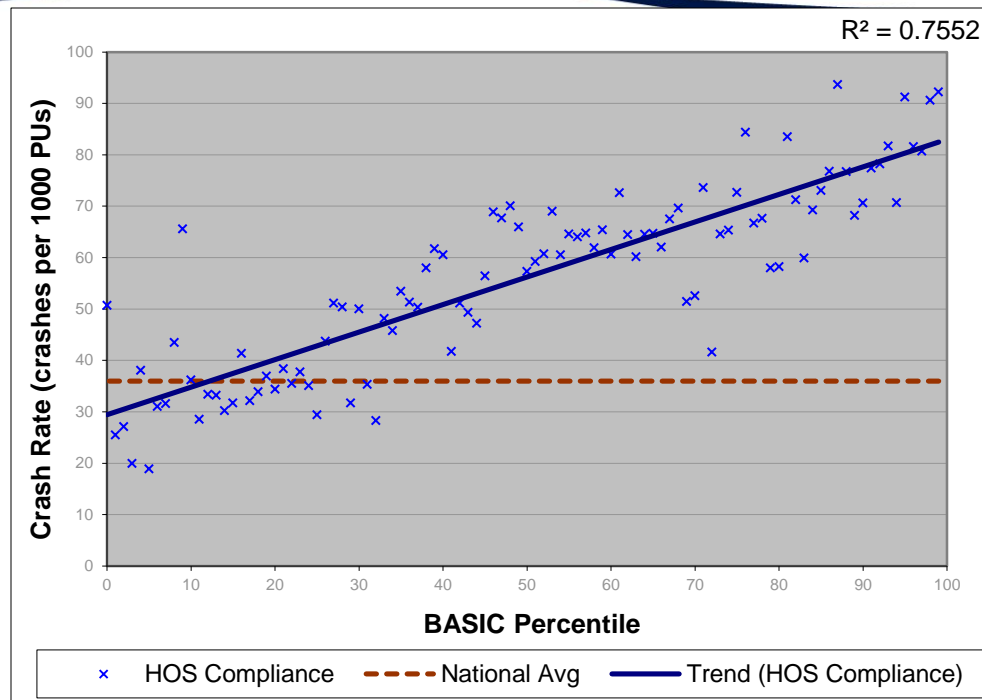


- Strong relationship between Unsafe Driving BASIC and future crash risk
- UMTRI CSA Evaluation and Recent ATRI paper show similar findings





FMCSA SMS Effectiveness Testing: HOS Compliance BASIC

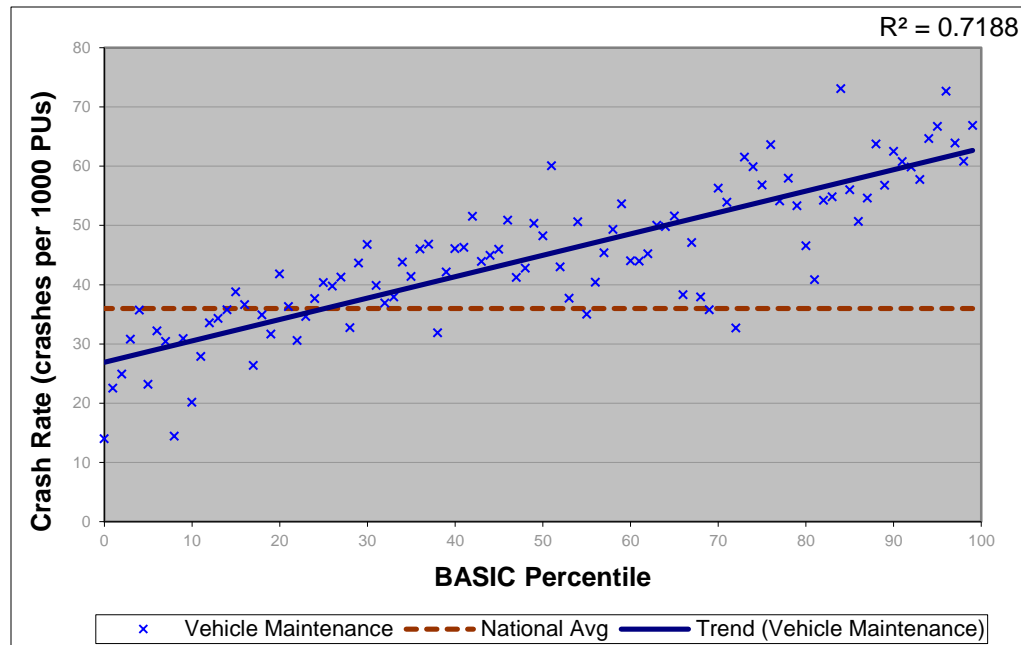


- Strong relationship between HOS Compliance BASIC and future crash risk
- UMTRI CSA Evaluation and Recent ATRI paper show similar findings





FMCSA SMS Effectiveness Testing: Vehicle Maintenance BASIC

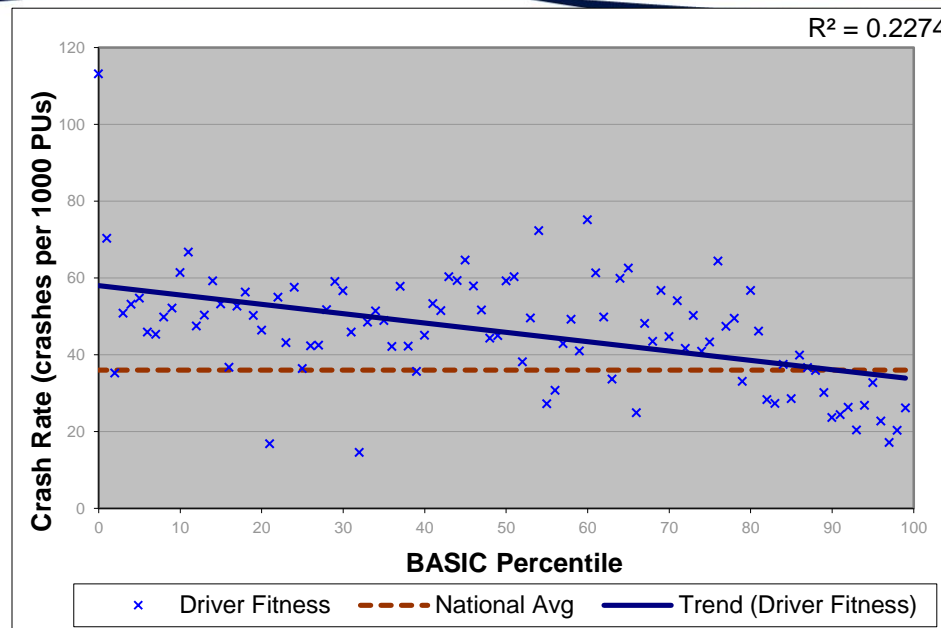


- Strong relationship between Vehicle Maintenance BASIC and future crash risk
- UMTRI CSA Evaluation and Recent ATRI paper show similar findings





FMCSA SMS Effectiveness Testing: Driver Fitness



- Negative relationship between Driver Fitness BASIC and future crash risk
- UMTRI CSA Evaluation and Recent ATRI paper show similar findings
- Three quarters of carriers above Driver Fitness, exceed threshold in another BASIC





FMSCA SMS Effectiveness Testing: Driver Fitness

Why does this negative relationship exist?

One significant area is lack of specificity in certain violations.

1) Most common violation in Driver Fitness: missing medical card.

- The driver may have misplaced the card: **Not** safety-related.
- The driver may have an expired medical card: Potentially safety-related.
- The driver may be medically unqualified: Strongly safety-related.

2) “Operating while suspended” violations do not specify reason. Recent ASPEN improvements provide for more precise severity weights for suspensions.

- The inability to distinguish between these cases significantly clouds the relationship with future crashes.





Overall FMSCA Testing– Results

- Strongest relationships with future crash risk exist for Unsafe Driving, Hours-of-Service, and Vehicle Maintenance BASICs and Crash Indicator
- Other BASICs show a weaker relationship to crash risk
- FMCSA optimizes resources and oversight responsibilities through more stringent Intervention Thresholds for BASICs with strongest associations to crash risk

BASIC	Above Threshold : Crashes per 100 PU	Below Threshold: Crashes per 100 PU	Increase in Crash Rate
Unsafe Driving	7.10	3.90	82%
Hours of Service Compliance	6.97	4.00	74%
Driver Fitness	2.85	4.43	-36%
Controlled Substance / Alcohol	2.81	5.25	-47%
Vehicle Maintenance	5.79	3.87	50%
HM Compliance	5.27	4.04	31%
Crash	6.59	3.58	84%
1+ BASIC (any BASIC)	5.05	3.05	66%



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Questions?

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