

CSA Impacts on Industry Safety

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Compliance, Safety, Accountability Evaluation

- Top RAC priority from 2010
- Speculation over far-reaching implications of CSA replacing SafeStat
- Significant concerns
 - ◆ Exacerbate driver shortage, drive motor carriers out of business, increase freight rates, etc.
- Possible benefits
 - ◆ Reduce unsafe behaviors, allow FMCSA to do more with less

ATRI Methodology

■ Two Tier Approach

◆ Supply Chain Impacts

- Carriers
- Drivers
- Shippers / Brokers
- Enforcement
- Insurance Industry

◆ Crash Risk Data Analysis

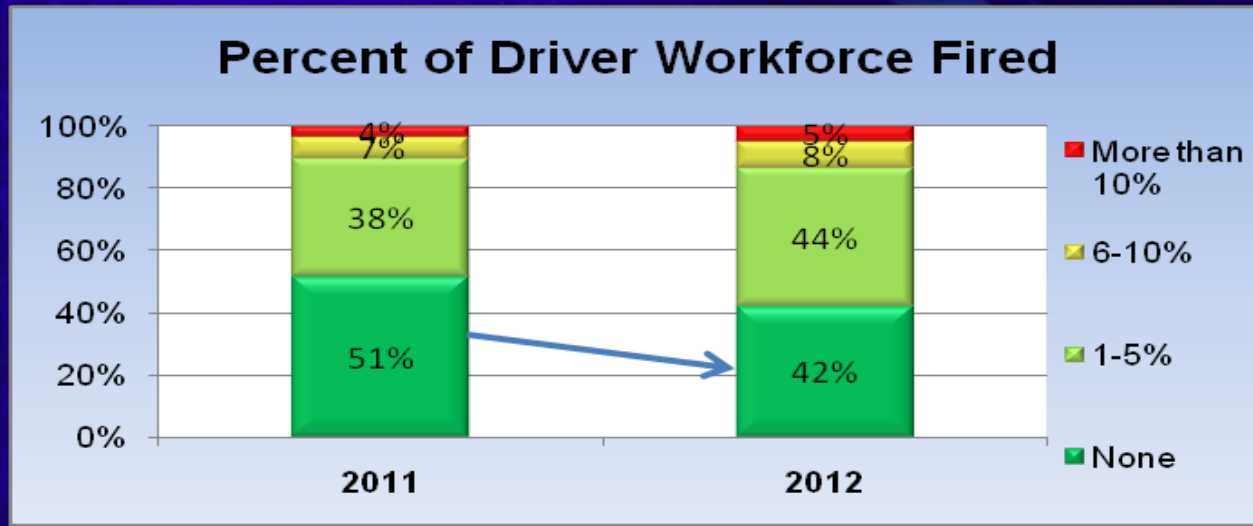
CSA Evaluation

- **Data Collection 2011 and 2012**
- **5,899 Commercial Drivers**
 - ◆ **MATS and online surveys**
- **1,028 Motor Carriers**
- **39 Enforcement personnel**
representing 25 states and Canada
- **31 Shippers representing tens of**
billions in freight movement

CSA Evaluation

■ Driver Supply

- ◆ 2/3rds of drivers continue to be somewhat or very concerned about being fired due to CSA
- ◆ However, close to 90% of carriers have fired no drivers or only 1-5% of drivers due to CSA

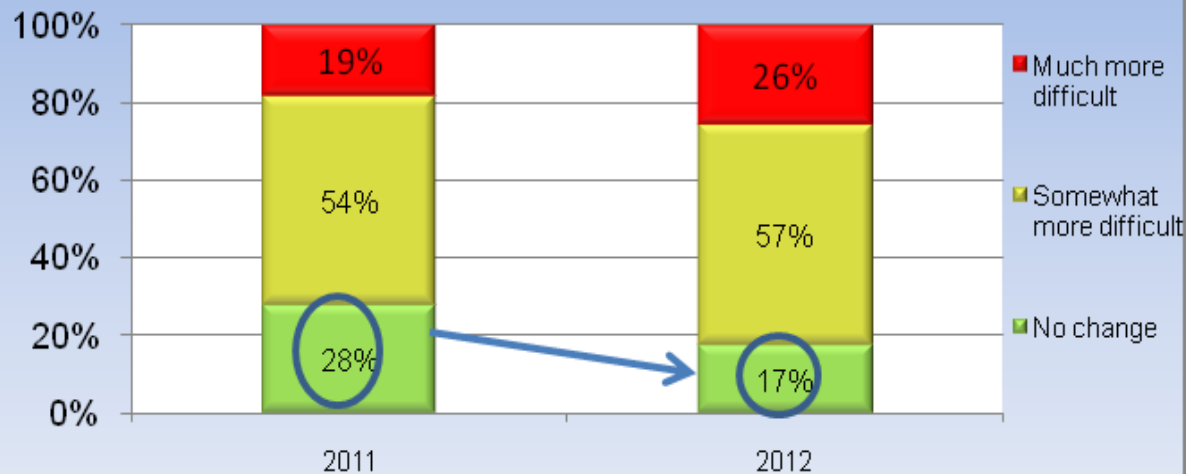


CSA Evaluation

■ Driver Supply

- ◆ Carriers reporting increased difficulty in finding new qualified drivers
- ◆ Increasing reliance on PSP – up to 74% in 2012 from 68% in 2011

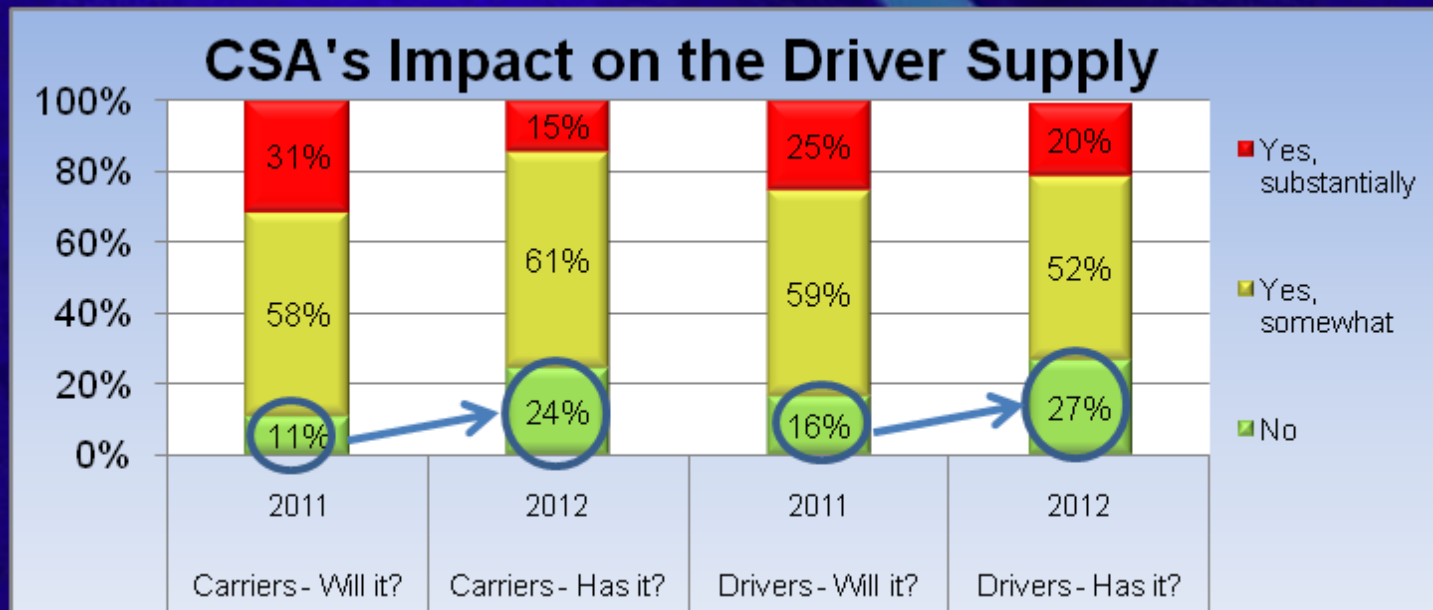
Difficulty of Finding Qualified New Drivers



CSA Evaluation

■ Driver Supply

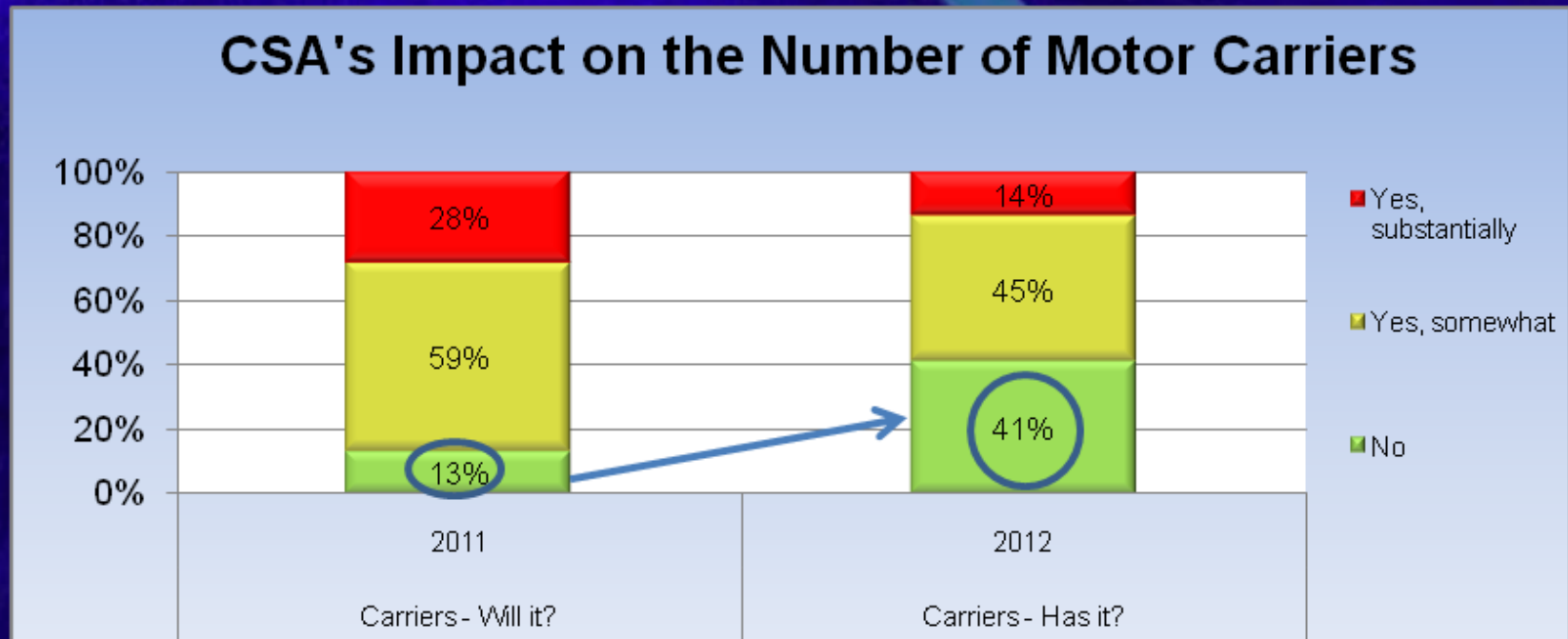
- ◆ Carriers and drivers expected dramatic impacts on labor pool as result of CSA – reality is impact is less than expected



CSA Evaluation

■ Number of Motor Carriers

- ◆ Similar disparity between expectations and reality in numbers of motor carriers impacted by CSA



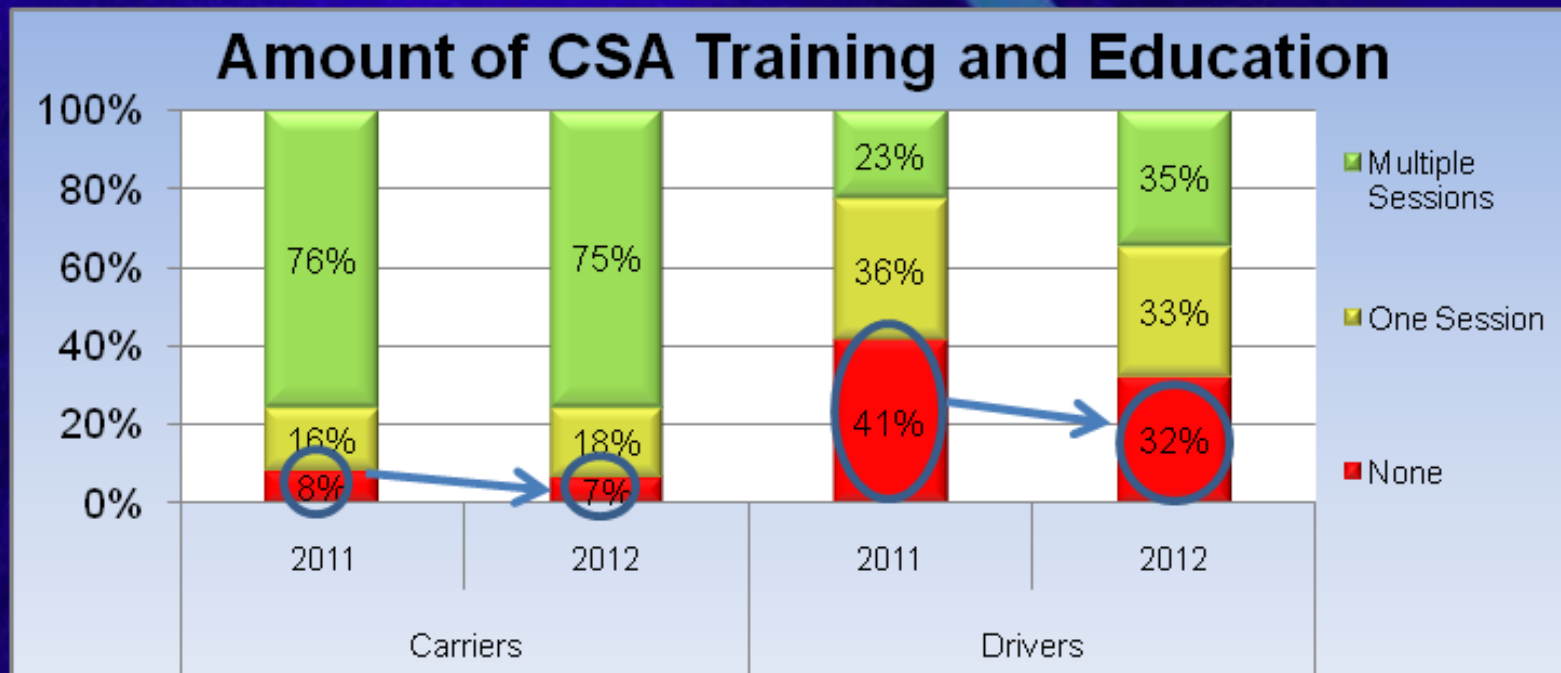
CSA Evaluation

■ Motor Carrier Impacts

- ◆ 44% of carriers are still somewhat or extremely concerned they will go out of business due to CSA
- ◆ Carriers are increasingly reporting adverse changes in insurance rates, shipper/broker utilization (more so in 2012 than 2011) due to CSA

CSA Evaluation

- **CSA Training**
- **Carriers report providing more CSA training/education than drivers report receiving**

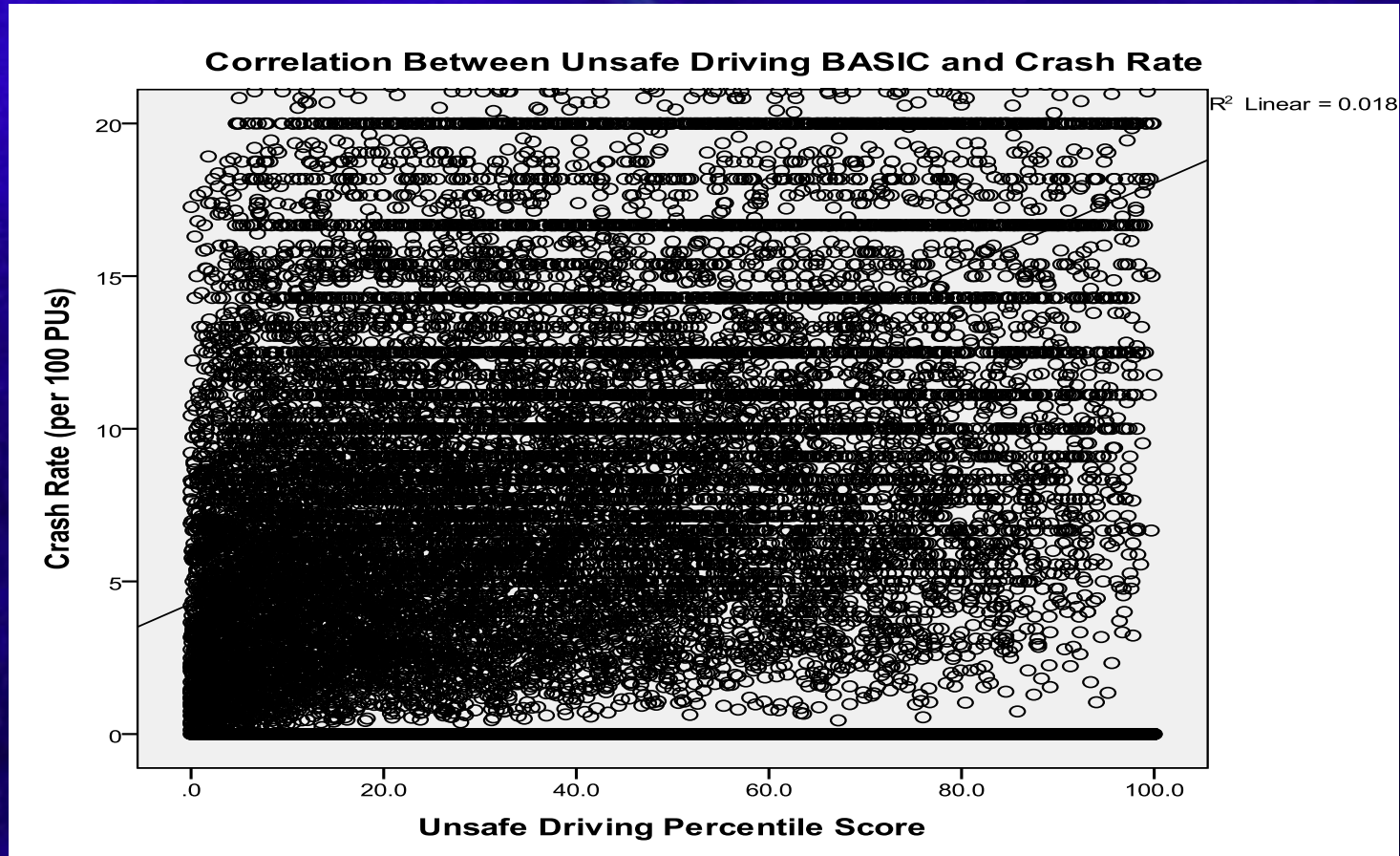


CSA Statistical Analysis

Previous Research:

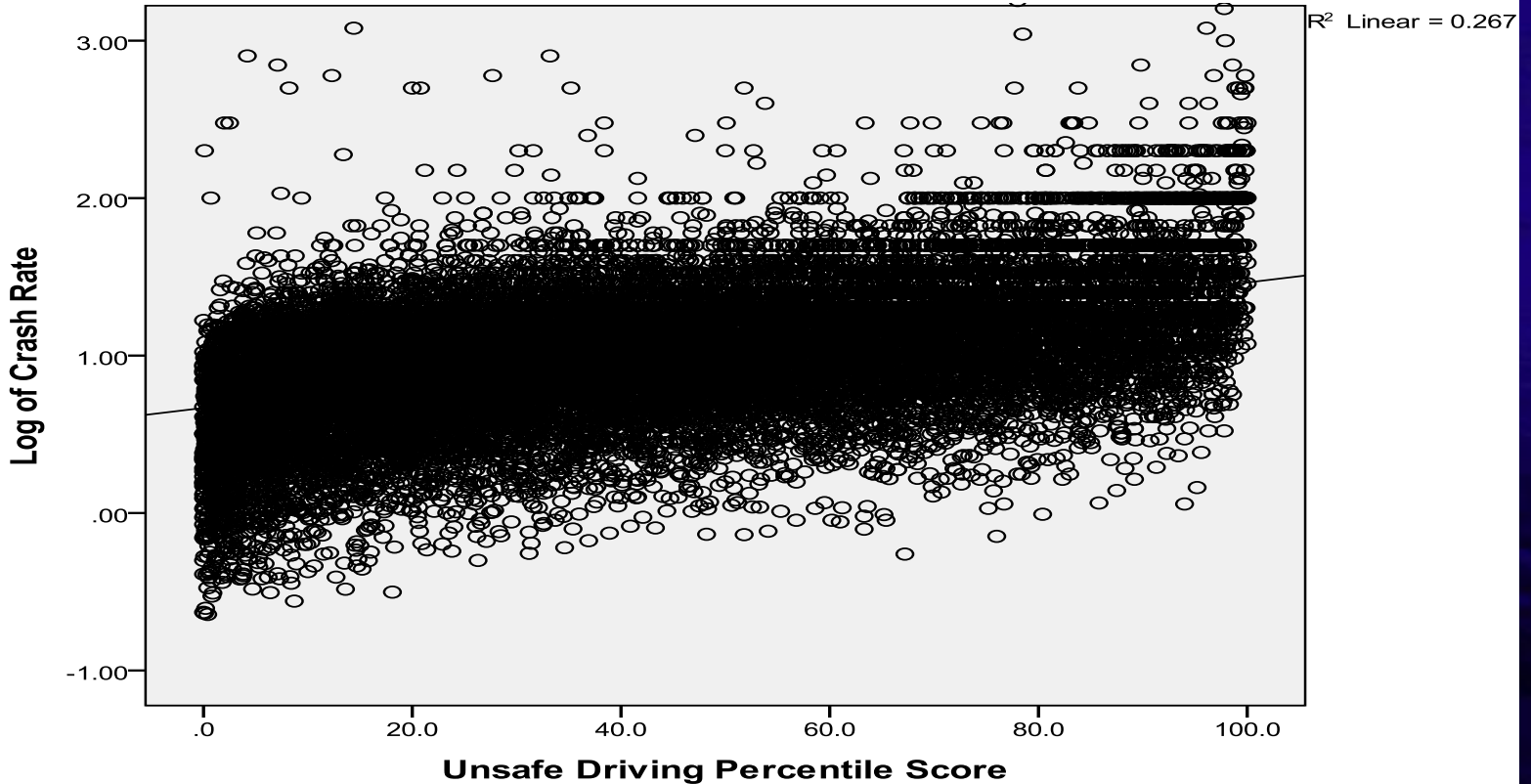
- Wells Fargo (2)
- U of Maryland
- Transplace
- U of Michigan

CSA Statistical Analysis



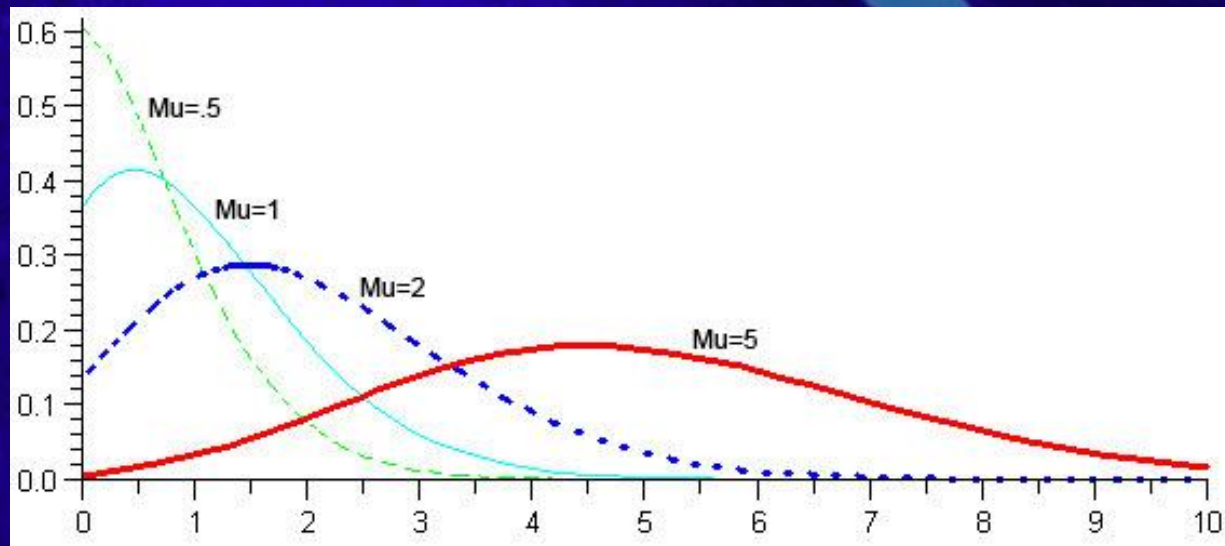
CSA Statistical Analysis

Correlation Between Unsafe Driving BASIC and Log Transformed Crash Rate



Recommended Approach: Negative Binomial Regression

- Explanation: "Count" data
 - ◆ (0, 1, 2, 3,)
- Non-normal distributions
 - ◆ Negative Binomial Regression



ATRI's Methodology

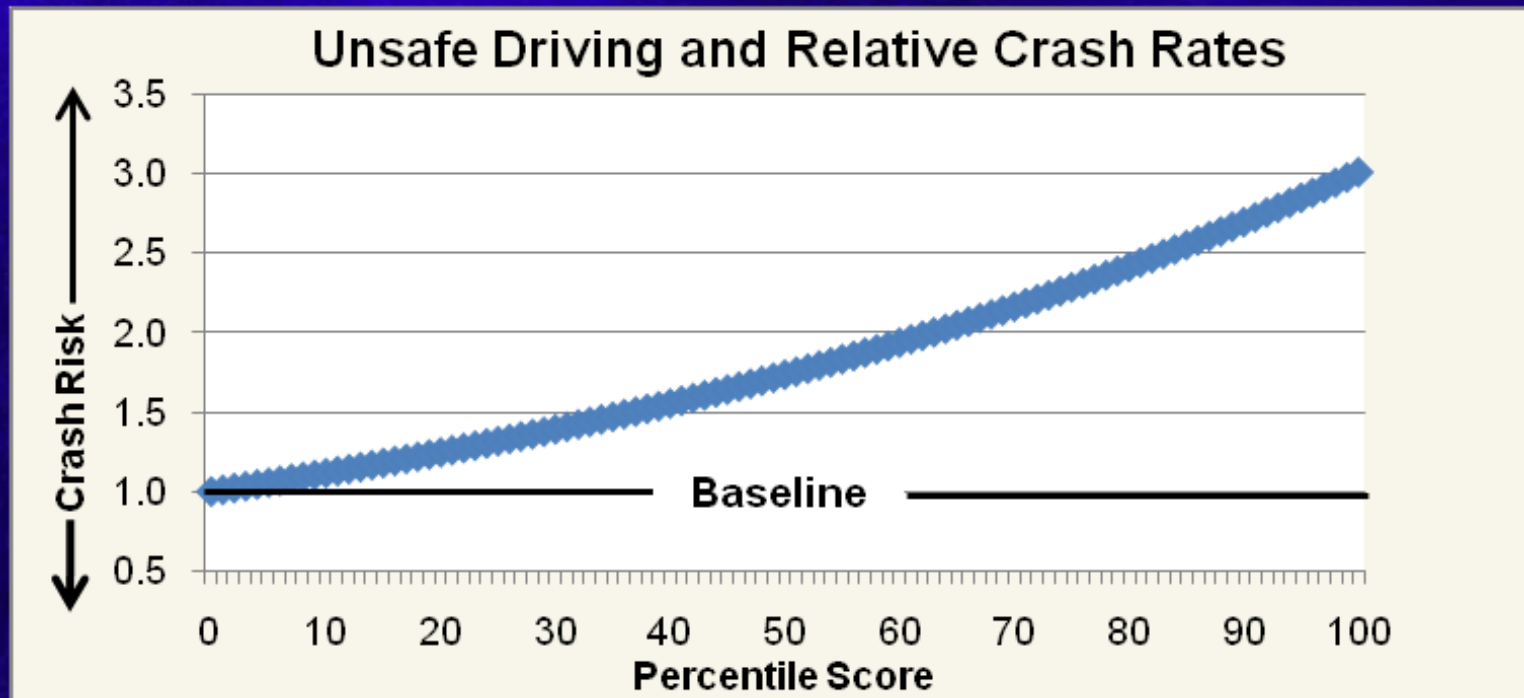
■ July 2012 SMS Data

- ◆ All recently active interstate carriers and intrastate hazmat carriers (N = 471,306)
- ◆ 24 months of historical crash data from MCMIS

Carrier Category	Number of Carriers	Percentage of Recently Active Carriers	Number of Crashes in Database	Percentage of Crashes in Database
Carriers with Recent Activity	471,306	100%	162,455	100%
Carriers with Insufficient Data	270,846	57.5%	11,831	7.3%
Carriers with Some Data but No Scores	109,837	23.3%	17,212	10.6%
Carriers with At Least 1 BASIC Score	90,623	19.2%	133,412	82.1%

Unsafe Driving

■ Percentile Scores and Crash Rates

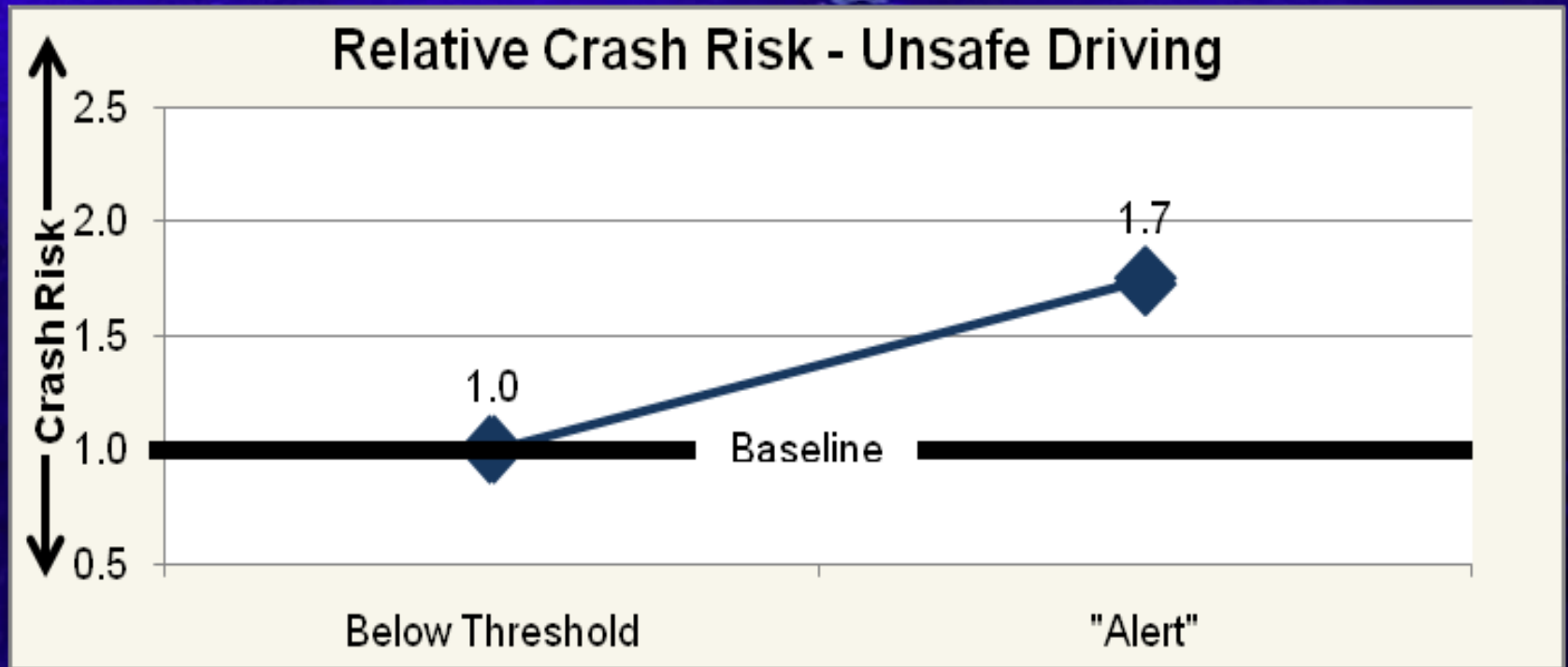


$$\lambda_i = \text{EXP}(\beta X_i + \varepsilon_i)$$

$$\text{Exp}(B^*(\text{percentile score})) = \text{Exp}(.011*(50)) = 1.73$$

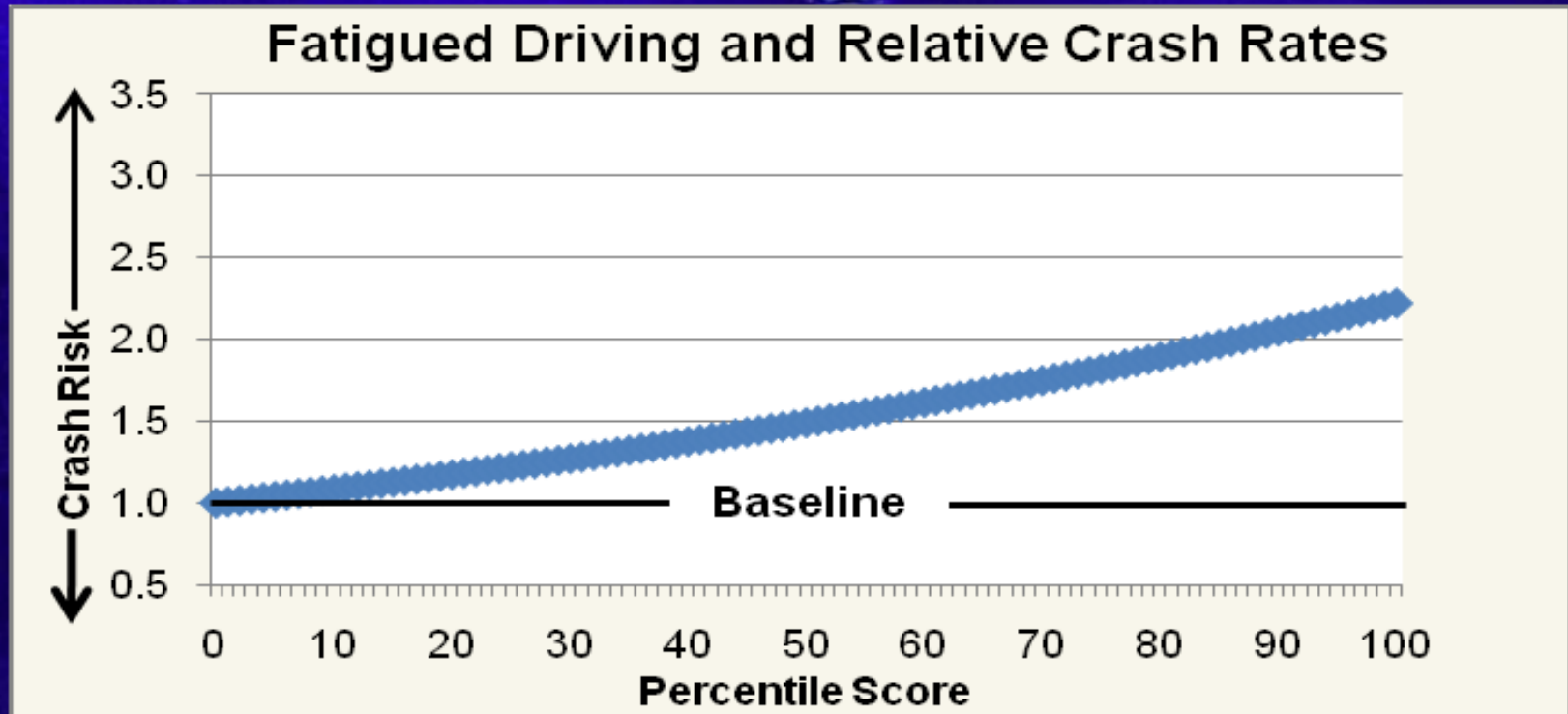
Unsafe Driving

■ Below Threshold vs. "Alert"



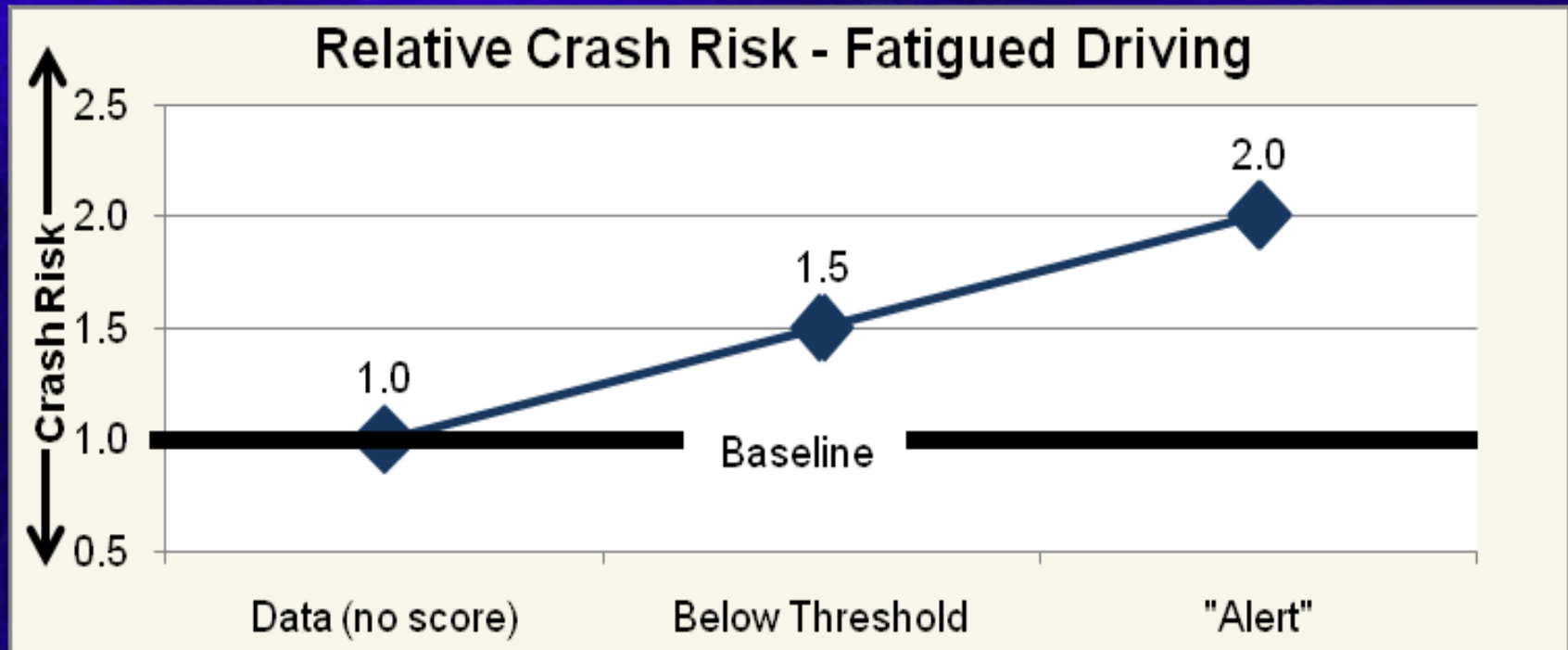
Fatigued Driving

■ Percentile Scores and Crash Rates



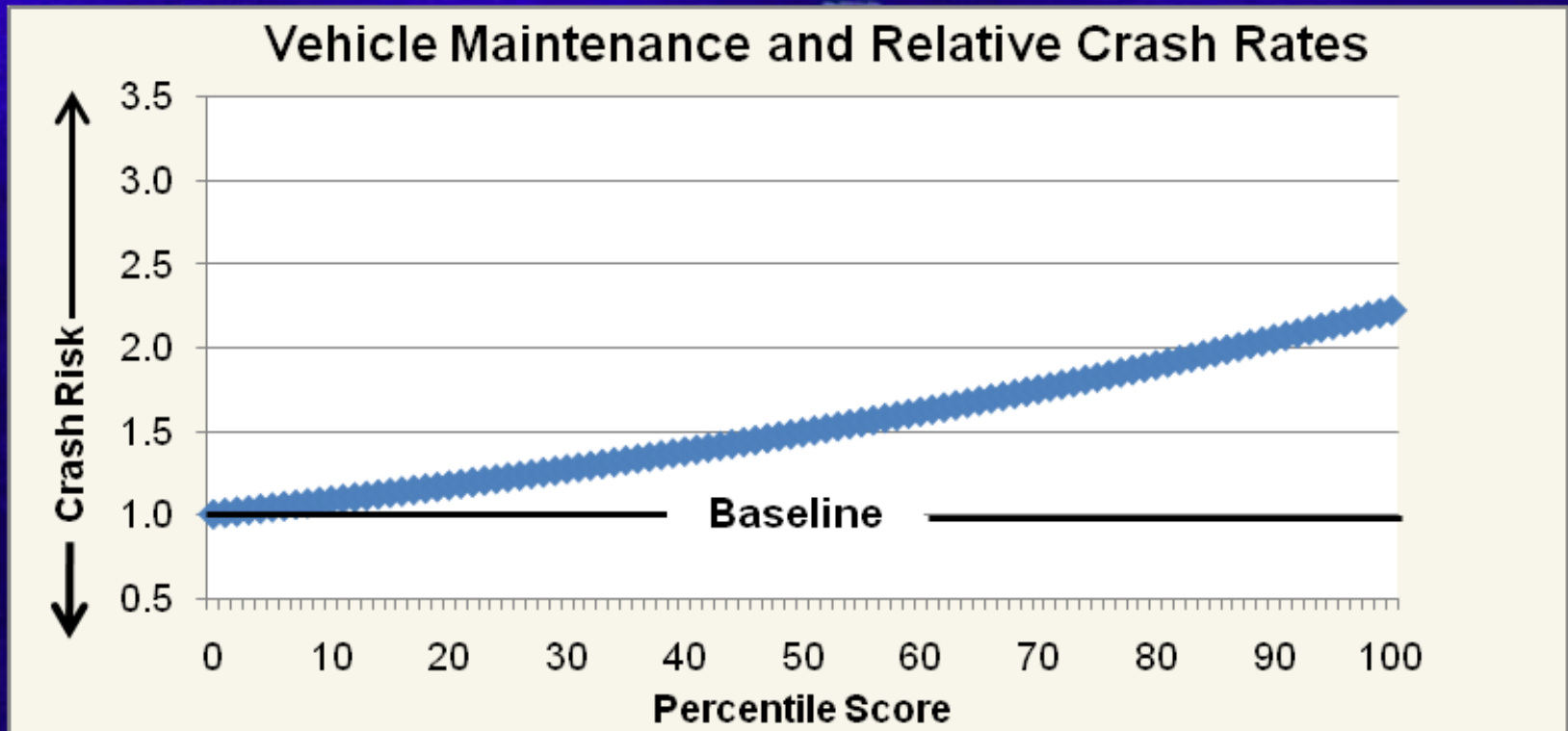
Fatigued Driving

- No Score vs. Below Threshold vs. "Alert"



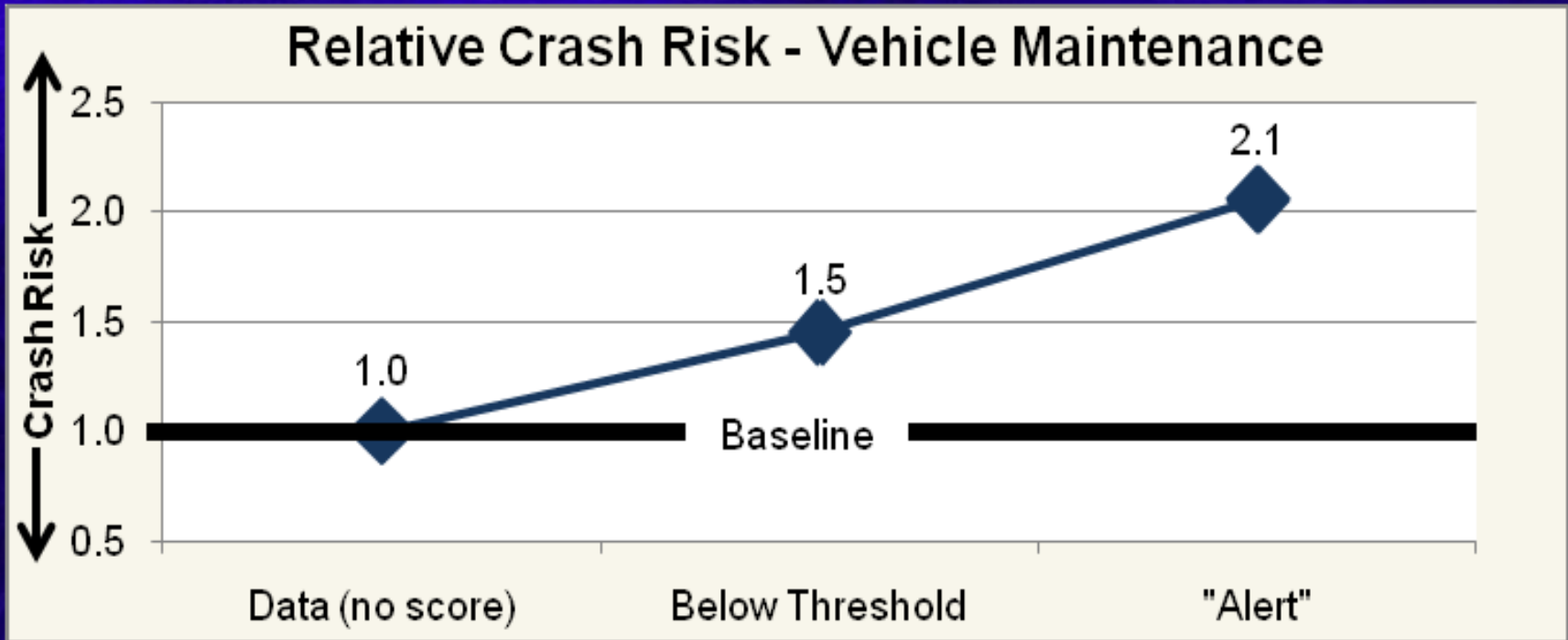
Vehicle Maintenance

■ Percentile Scores and Crash Rates



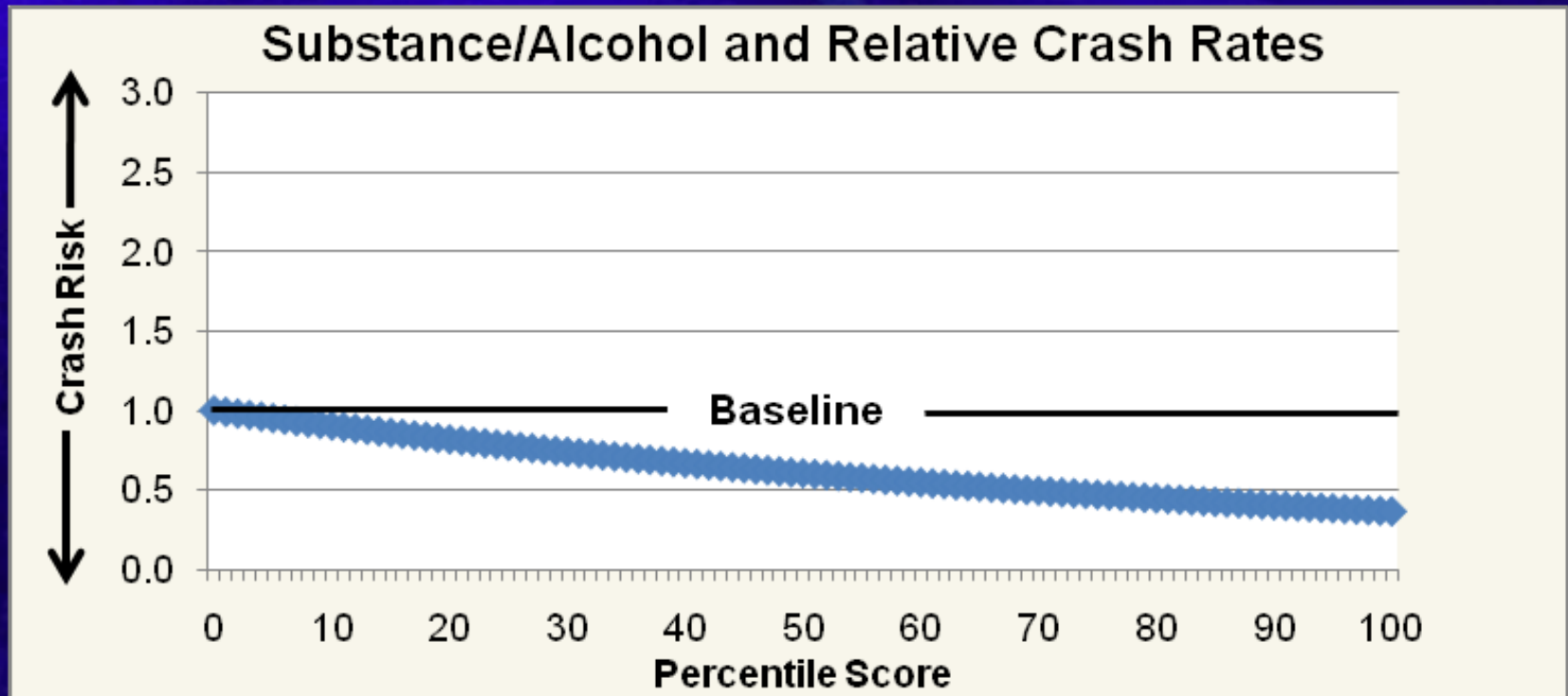
Vehicle Maintenance

- No Score vs. Below Threshold vs. "Alert"



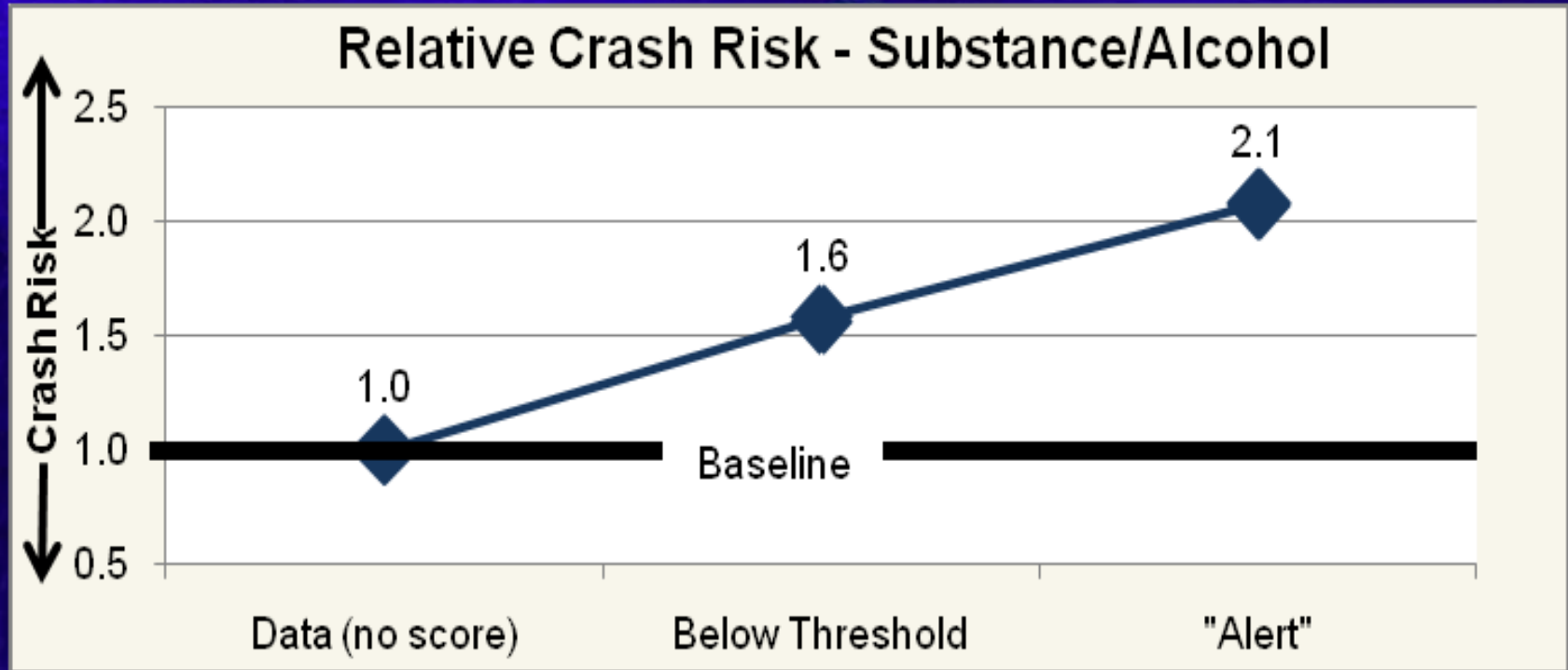
Controlled Substances/Alcohol

■ Percentile Scores and Crash Rates



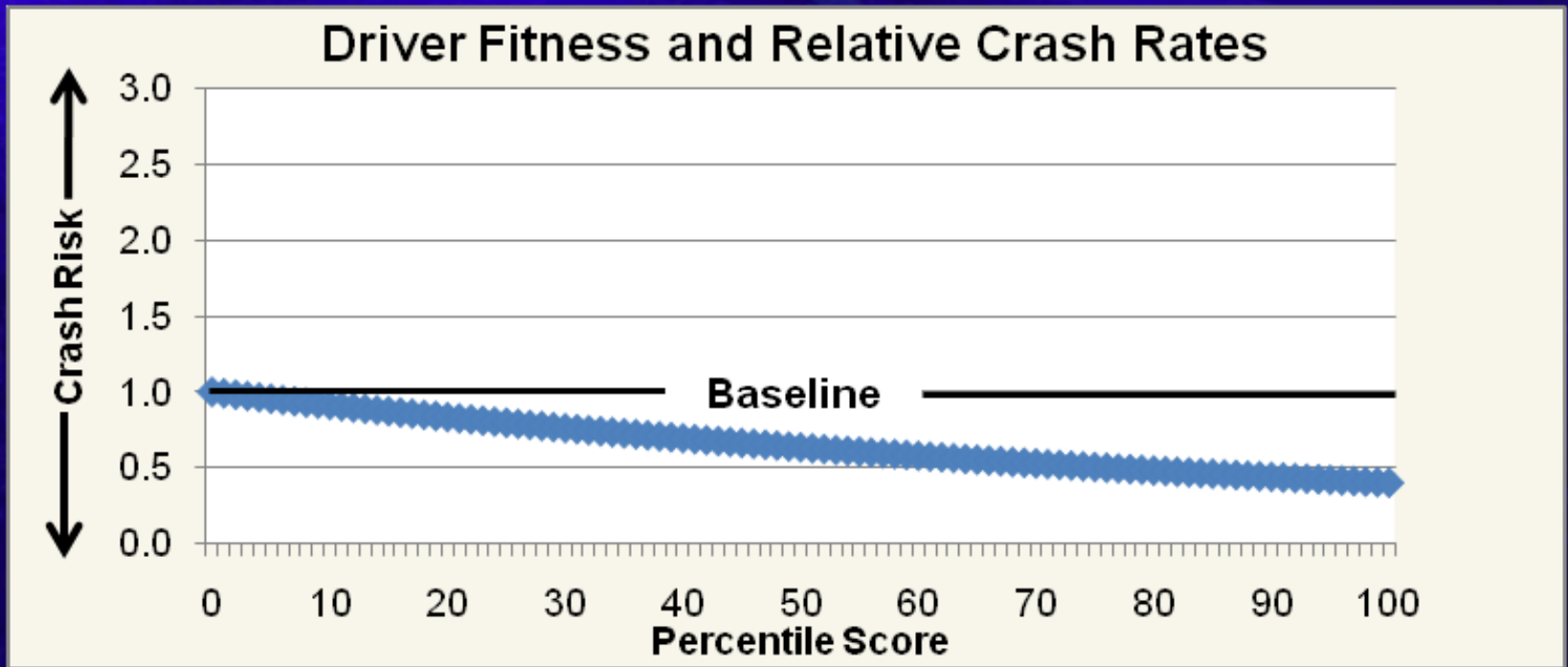
Controlled Substances/Alcohol

- No Score vs. Below Threshold vs. "Alert"



Driver Fitness

■ Percentile Scores and Crash Rates

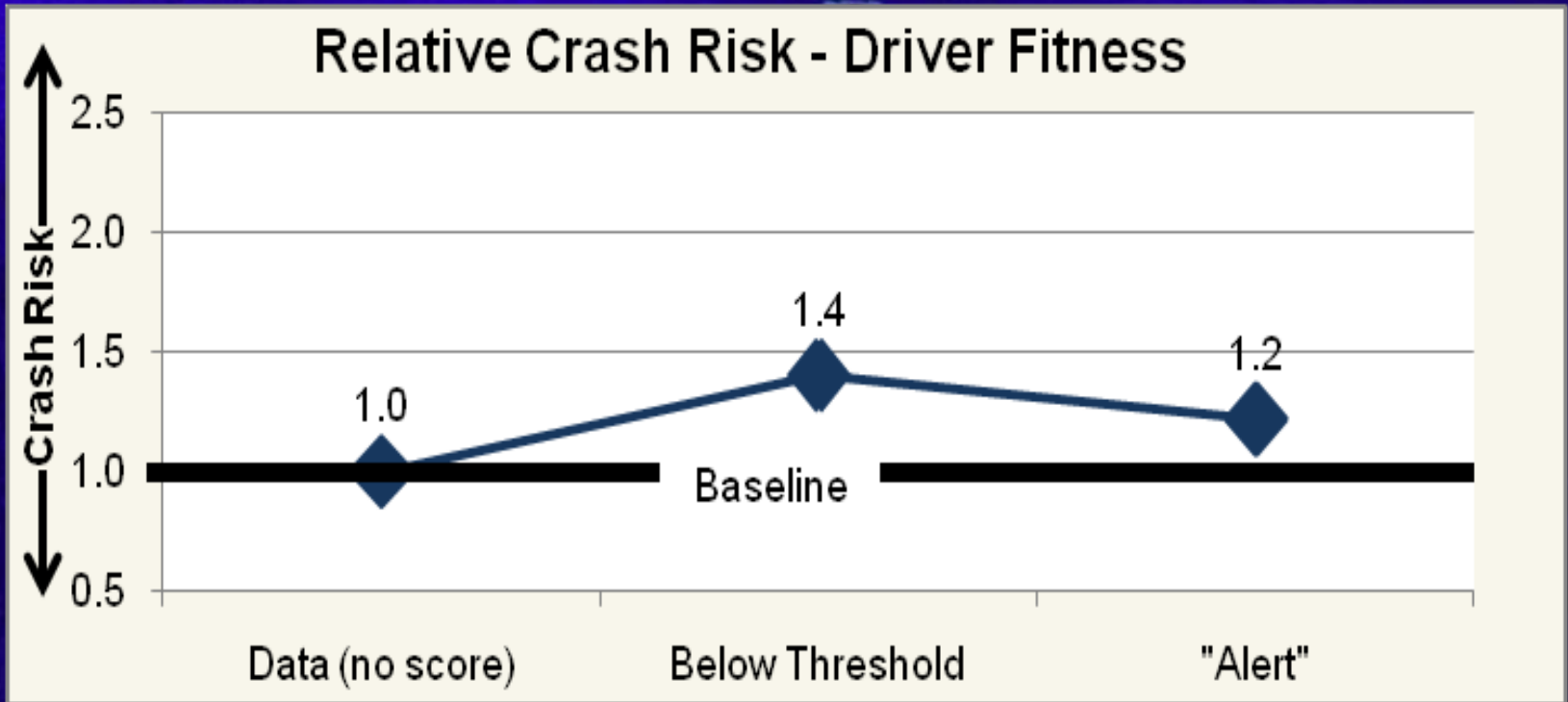


$$\lambda_i = \text{EXP}(\beta X_i + \varepsilon_i)$$

$$\text{Exp}(B^*(\text{percentile score})) = \text{Exp}(-.009*(50)) = 0.64$$

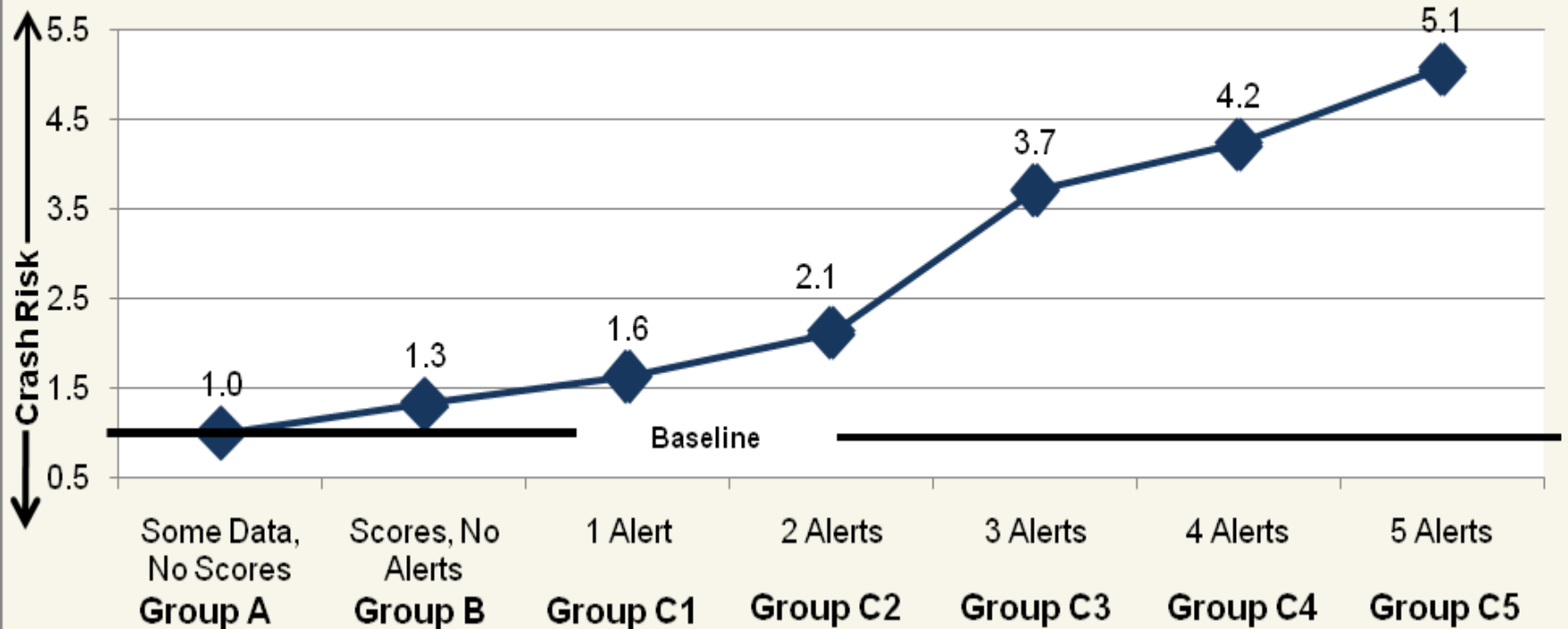
Driver Fitness

- No Score vs. Below Threshold vs. "Alert"










Statistically Defensible Safety Conclusions

Crash Risk By Proposed Safety Category



Statistically Defensible Safety Conclusions

Classification Group	Description	Level of Safety Risk
		Low → High
Group A	Sufficient data in at least one BASIC, but no scores	
Group B	Scores in at least one BASIC, but no "Alerts"	
Group C-1	1 "Alert"	
Group C-2	2 "Alerts"	
Group C-3	3 "Alerts"	
Group C-4	4 "Alerts"	
Group C-5	5 "Alerts"	

Violations	SMS Violation Severity Weight	Increase in Crash Likelihood
Crash Indicator BASIC		
Past Crash	*	88%
Driver Fatigue BASIC		
Hours-of-Service violation	7	45%
False or No Log Book violation	7	42%
Cargo-Related BASIC		
Size and Weight violation**	-	18%
Unsafe Driving BASIC		
Reckless Driving violation	10	88%
Failure to Yield Right of Way violation	5	41%
Improper Turns violation	5	15%
Improper Passing violation	5	88%
Improper Lane Change violation	5	41%
Following Too Close violation	5	41%
Speeding violation	5	38%
Failure to Obey Traffic Control Device violation	5	21%
Driver Fitness BASIC		
Disqualified Driver violation	8	15%
Medical Certificate violation	1	2%

*Weights are assigned to crashes contingent on crash severity (e.g. injuries, fatalities)

**Size and Weight violation has been removed from the Cargo-Related BASIC equation

Questions?

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