

A faded, light-colored map of a city grid with various colored areas (green, blue, tan) representing parks, water, and other landmarks. The map is centered in the background.

DAN MURRAY

ATRI

A dark blue puzzle piece graphic with several interlocking tabs and sockets. It is positioned in the bottom right corner of the slide.

TRUENORTH
TRANSPORTATION
RISK SUMMIT
CEDAR RAPIDS, IA
AUG 17 • 18, 2016

Trucking's Top 10:

The View from the Road

Dan Murray
American Transportation
Research Institute

STEP UP
And leave your
footprint.

ATRI American
Transportation
Research
Institute

Board of Directors



Research Advisory Committee



2015 Top Industry Issues

1. Hours-of-Service
2. CSA
3. Driver Shortage
4. Driver Retention
5. Truck Parking
6. ELD Mandate
7. Driver Health & Wellness
8. Economy
9. Transportation Infrastructure/
Congestion/Funding
10. Driver Distraction

CRITICAL ISSUES IN THE TRUCKING INDUSTRY – 2015



Presented to the
American Trucking Associations

Prepared by
The American Transportation Research Institute
October 2015



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Top Issues Drivers vs. Carriers

Commercial Drivers

1. Hours-of-Service
2. Truck Parking
3. CSA
4. ELD Mandate
5. Driver Retention
6. Driver Health/Wellness
7. Economy
8. Driver Distraction
9. Transportation Infrastructure /Congestion/Funding
10. FMCSA Mission

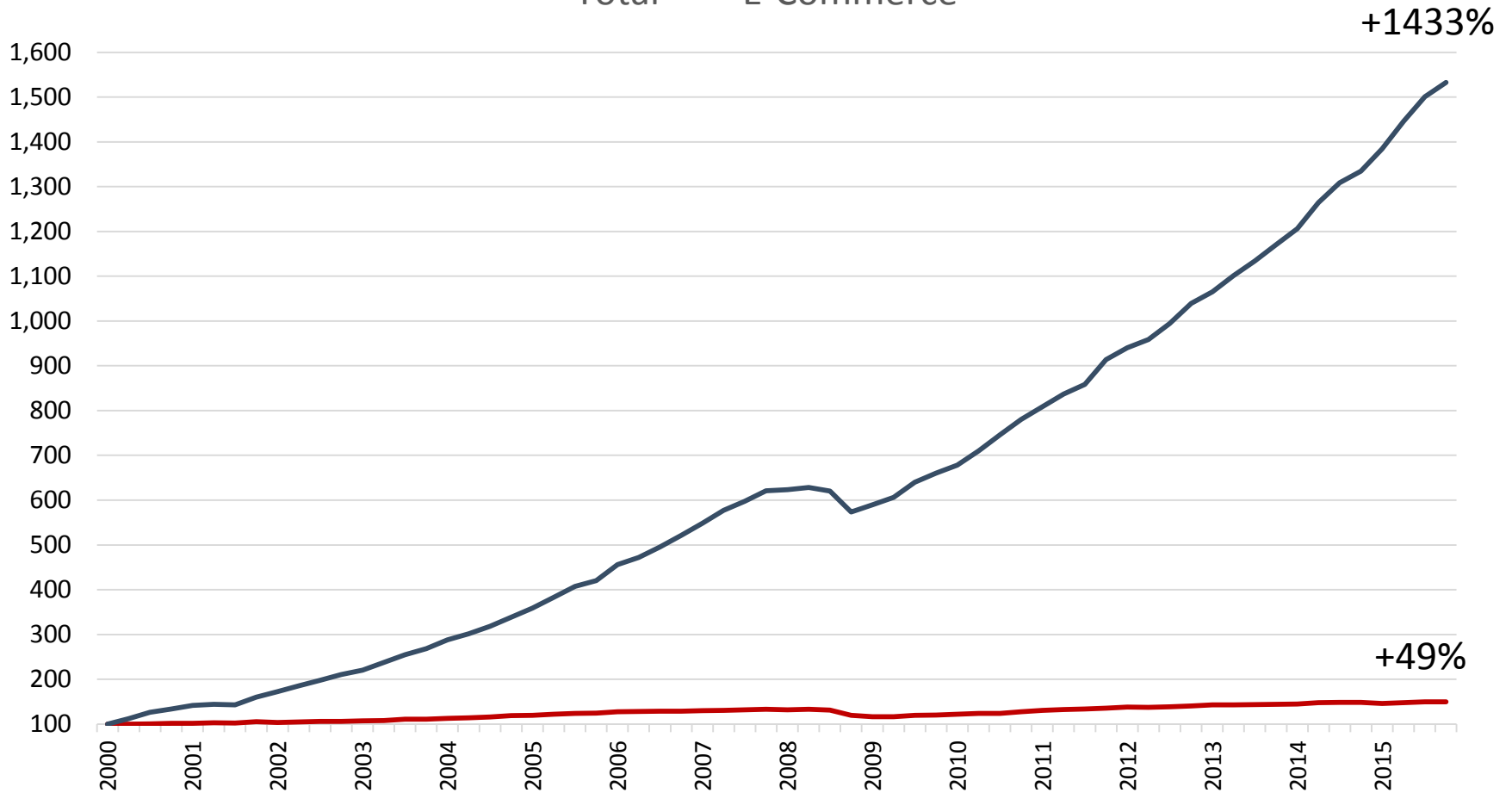
Motor Carrier Execs

1. Driver Shortage
2. Driver Retention
3. Hours-of-Service
4. CSA
5. Transportation Infrastructure /Congestion/Funding
6. ELD Mandate
7. Economy
8. Driver Health/Wellness
9. FMCSA Mission
10. Driver Distraction

Retail Sales

(Q1 2000 = 100)

— Total — E-Commerce

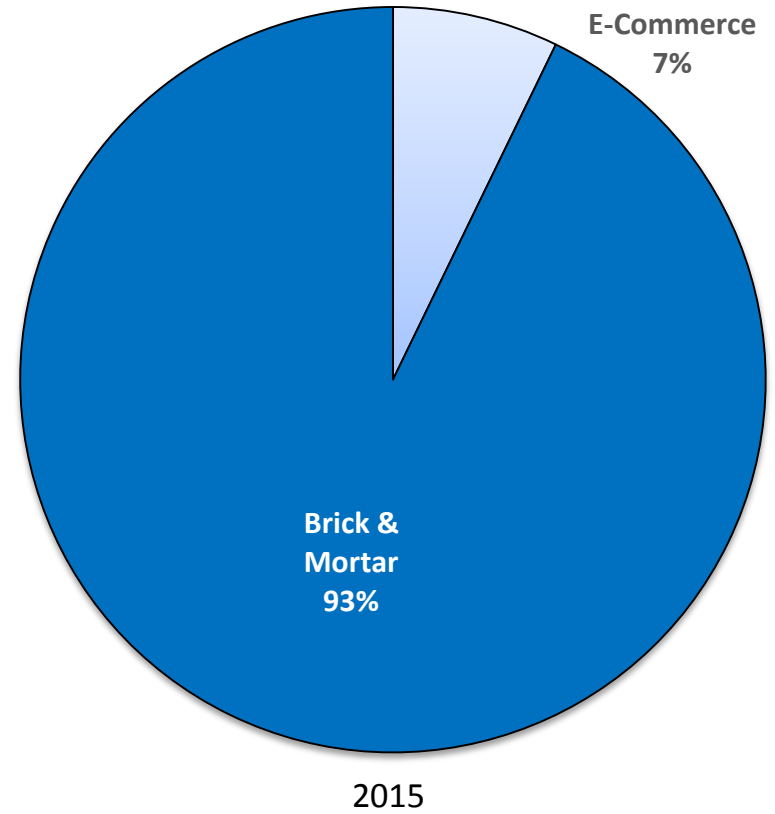
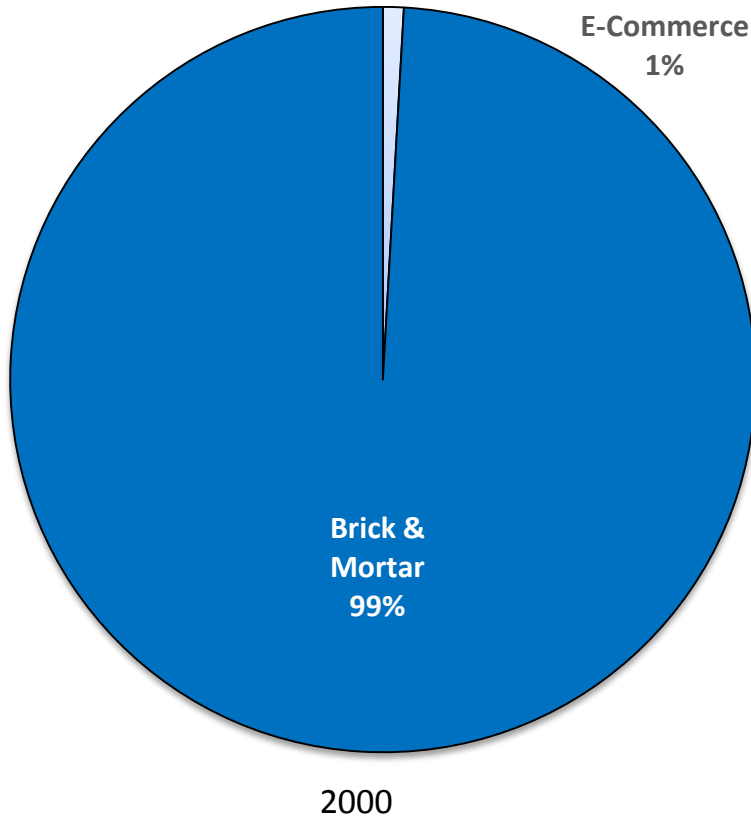


Source: Census Bureau



TRUCKING
Moves America Forward

Retail Sales

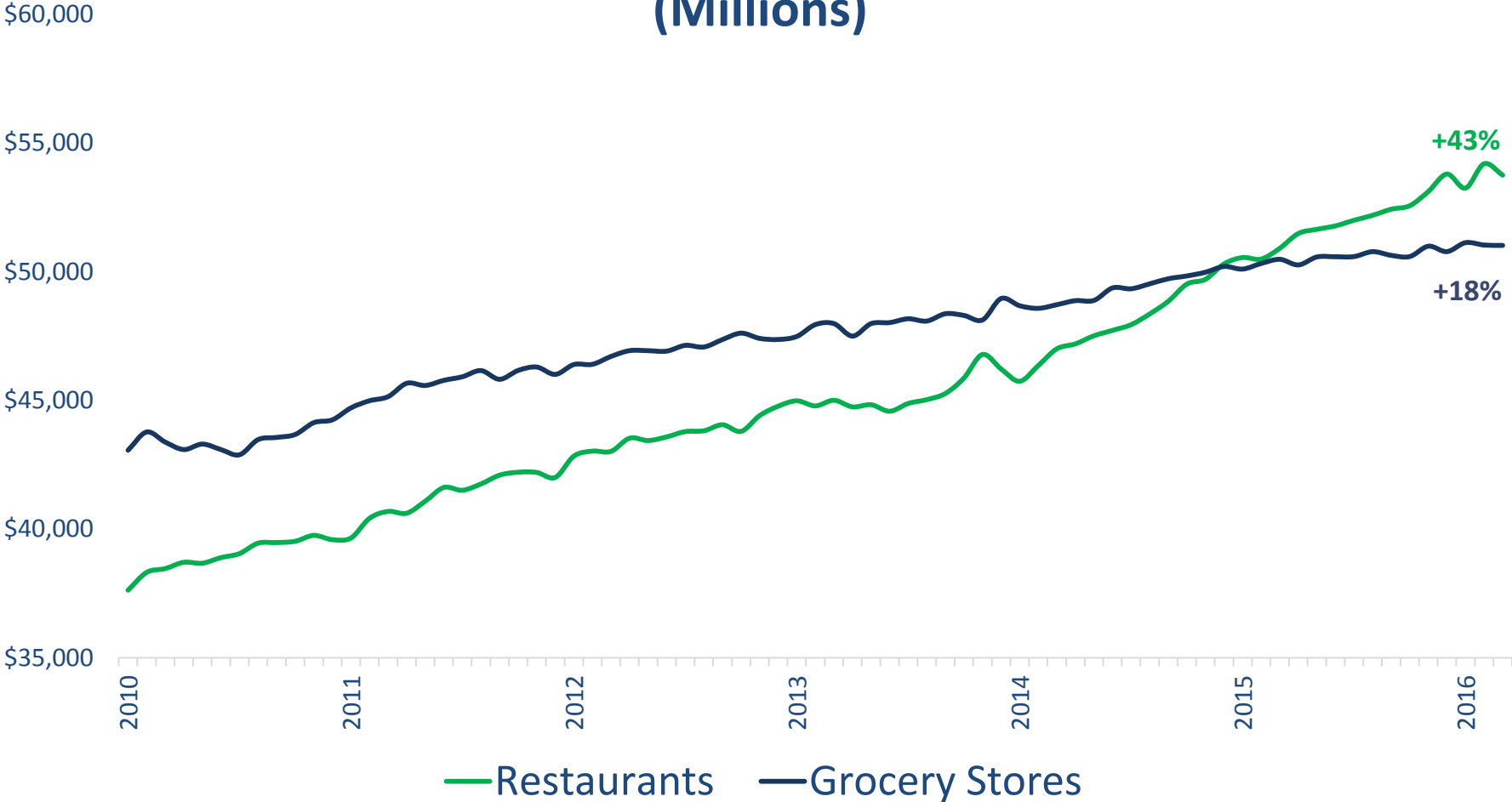


When excluding autos, gasoline, and food and beverage, on-line sales are 15% of total sales.

Source: Census Bureau

And It Is Not Just On-Line Sales That Are Changing

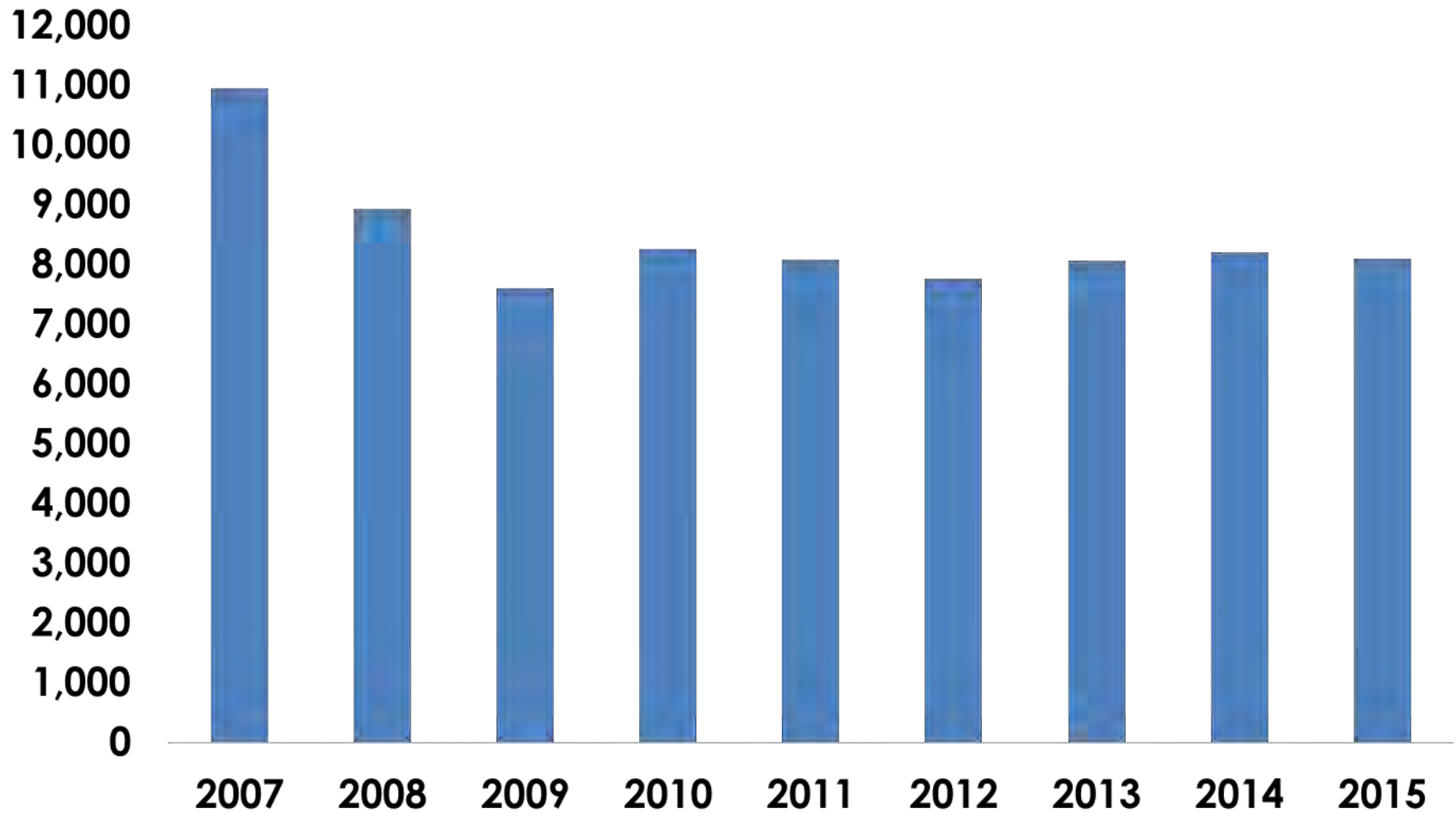
Select Retail Sales (Millions)



Source: US Census Bureau

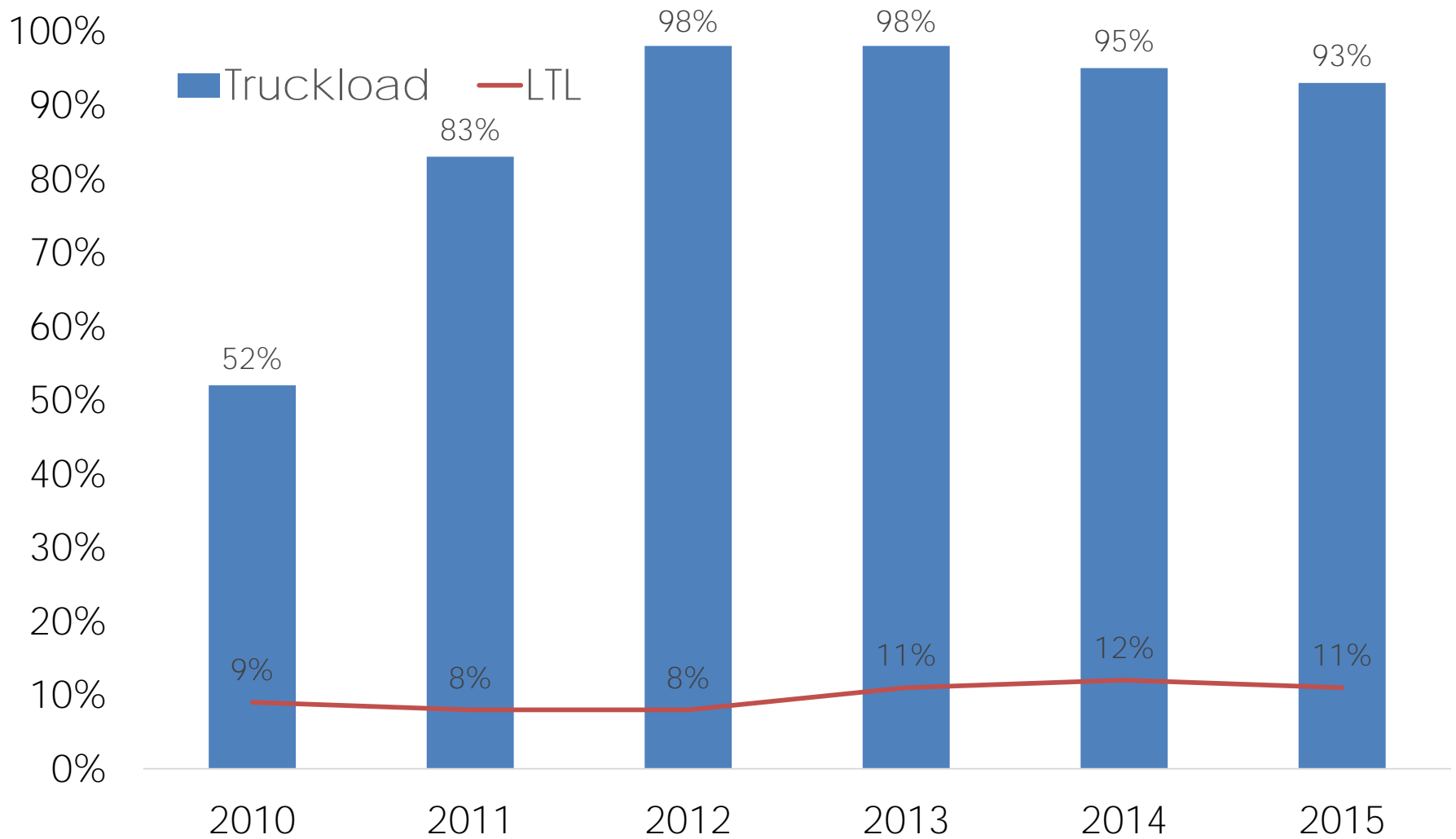


TL Miles per Truck per Month (Annual Averages)



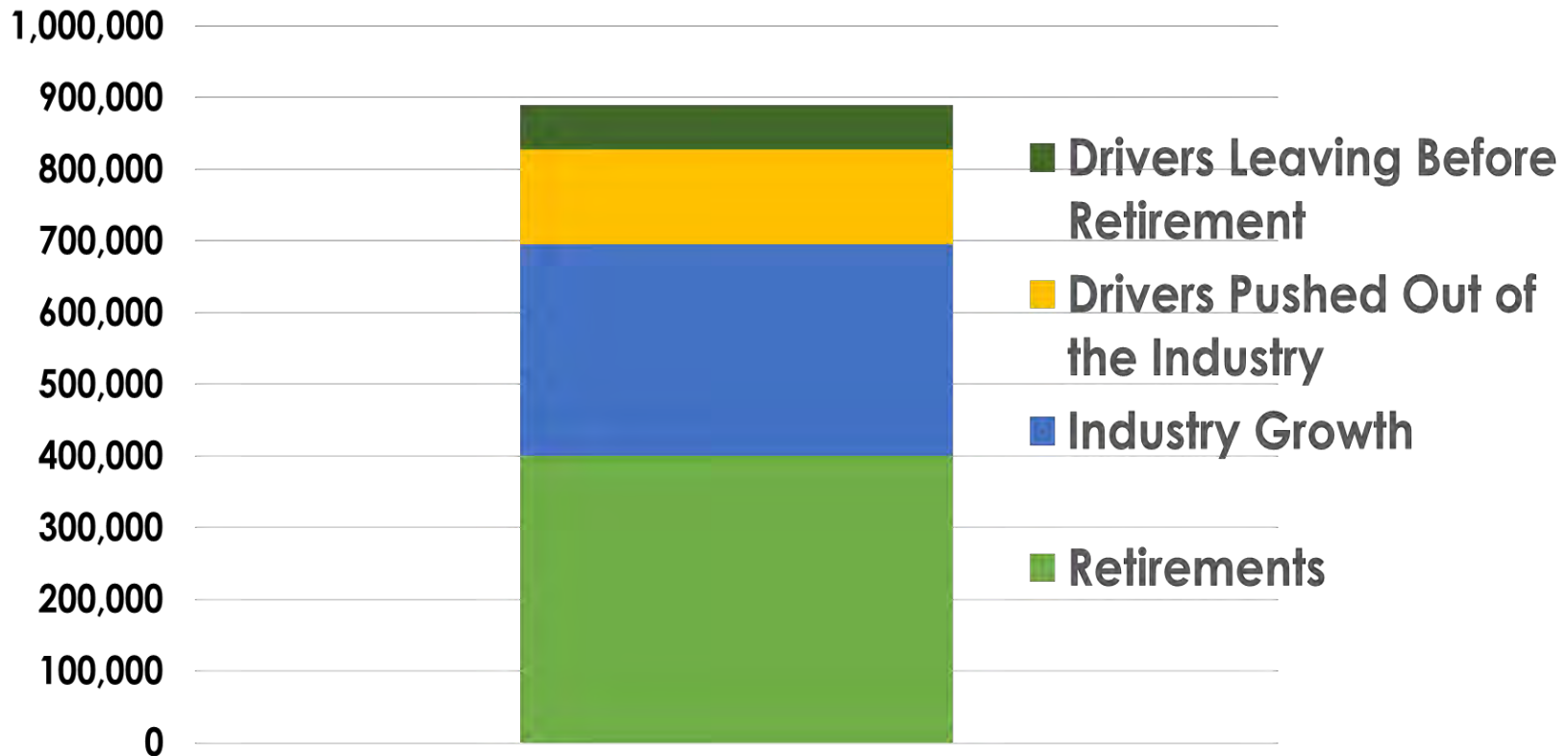
Source: ATA's *Trucking Activity Report*

Annualized Line-haul Driver Turnover Rates



Source: ATA's *Trucking Activity Report*

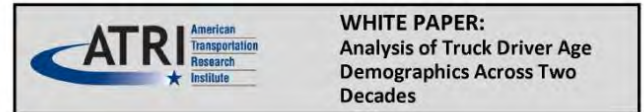
New Drivers Needed by Reason 2015-2024



Source: ATA's *Truck Driver Shortage Analysis 2015*

Analysis of Truck Driver Age Demographics Across Two Decades

- Identified as a top RAC priority – 2013
- Analysis of U.S. Census Bureau data
- Examines demographic trends in driver workforce with implications for future

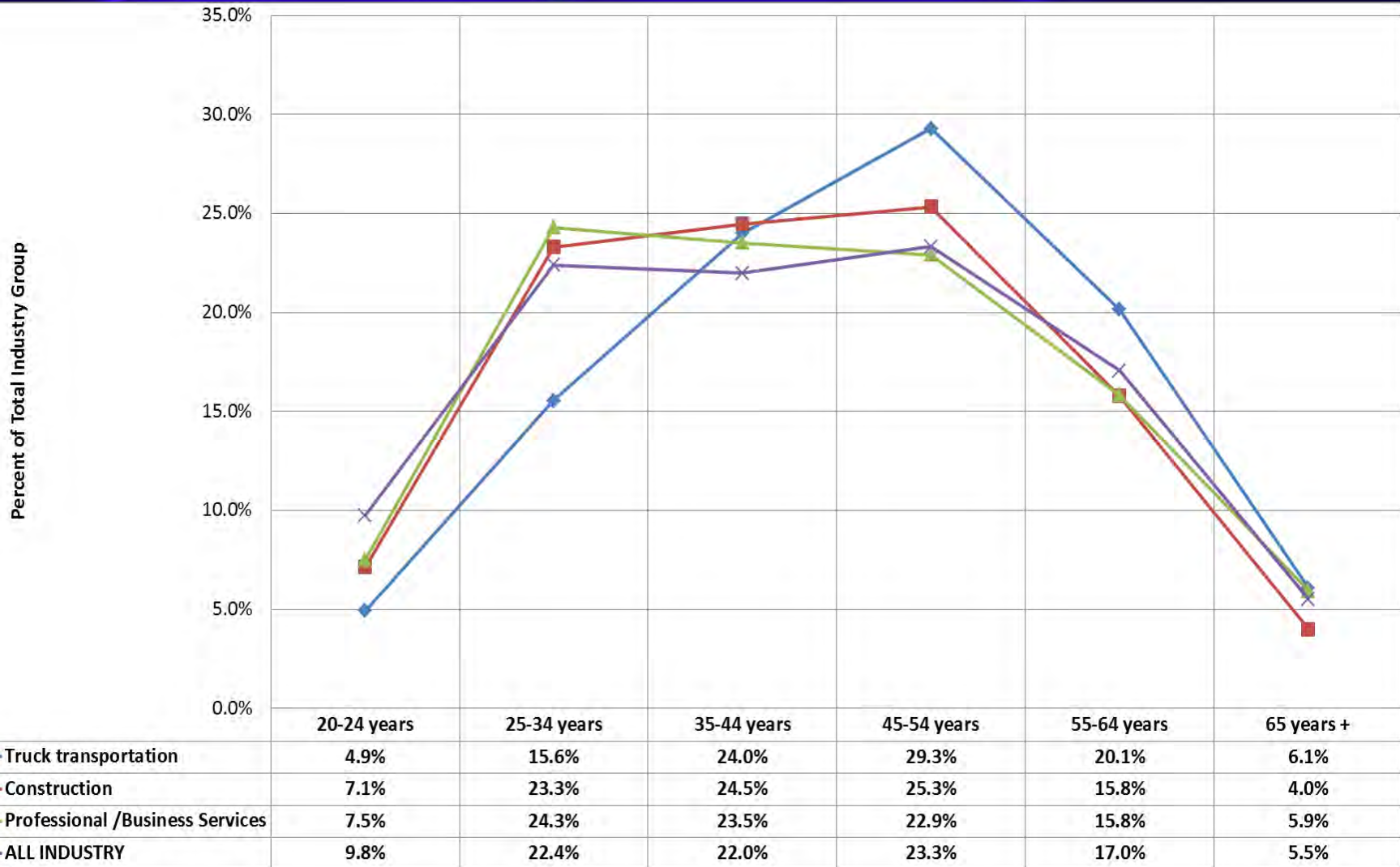


December 2014

Jeffrey Short
Senior Research Associate
American Transportation Research Institute
Atlanta, GA



Truck Driver Age Demographics



Younger Driver Assessment Tool

- Top RAC priority 2015
- Create assessment tool to identify subset of younger drivers with personality attributes of safe older drivers
- Stepped approach of assessing viability after each task is completed
- Preliminary Report for Task 1 Literature Review
 - ◆ Risk characteristics of target age group
 - ◆ Risk factors
 - ◆ Recommendations

34-Hour Restart Impacts



**TECHNICAL MEMORANDUM:
QUANTIFYING IMPACTS FROM THE
34-HOUR RESTART PROVISIONS**

April 2015

Daniel C. Murray
Vice President, Research
American Transportation Research Institute
Minneapolis, MN

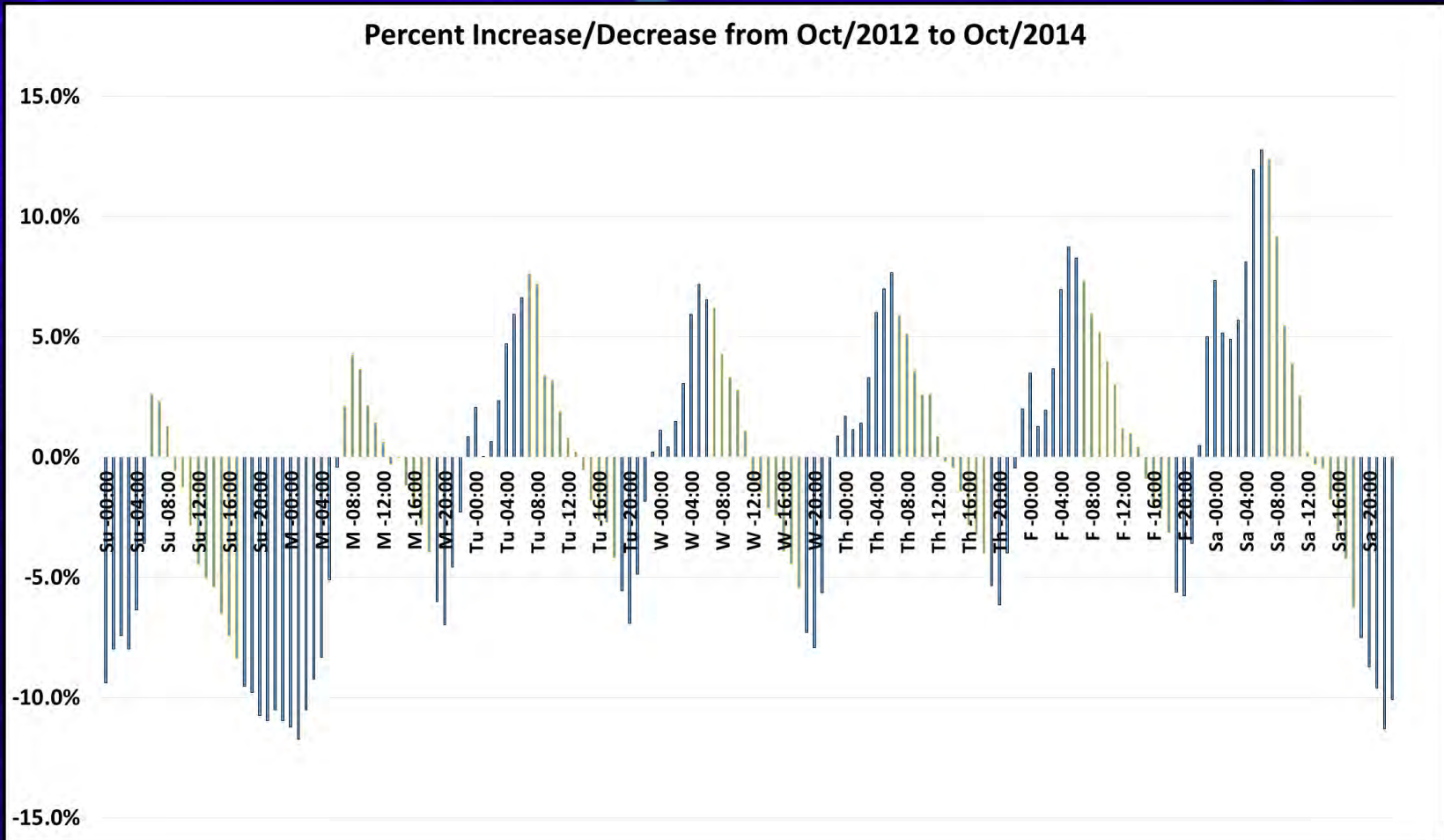
Jeffrey Short
Senior Research Associate
American Transportation Research Institute
Atlanta, GA



- Analyzed full year pre-/post-July 1, 2013 truck GPS and crash data
- Impacts on operations and safety
- RAC priority – 2014

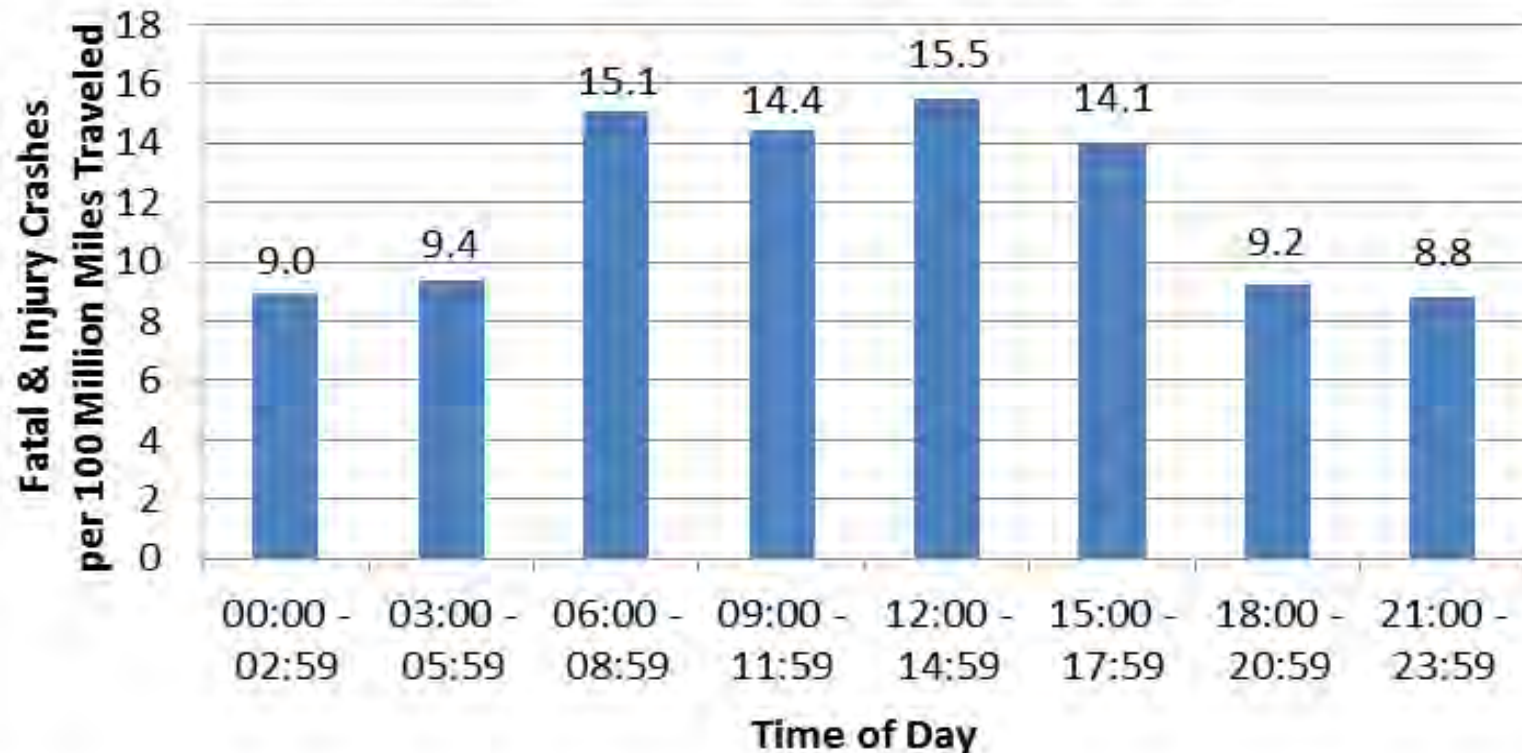


Moving Drivers to Daytime



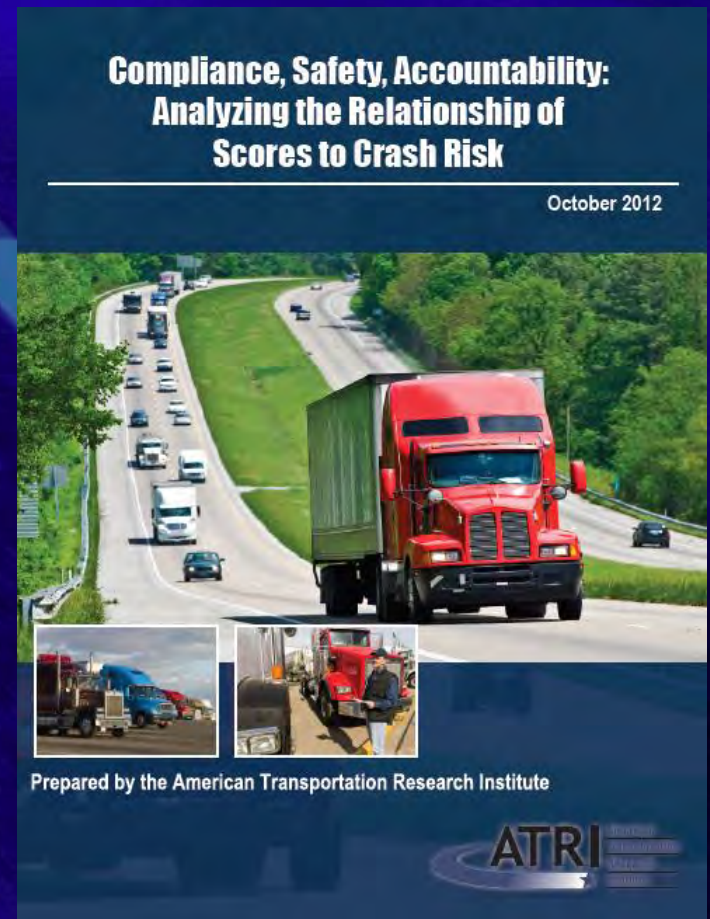
Crash Risk for Drivers by Time of Day

2011 Large Truck Crash Rate by Time of Day

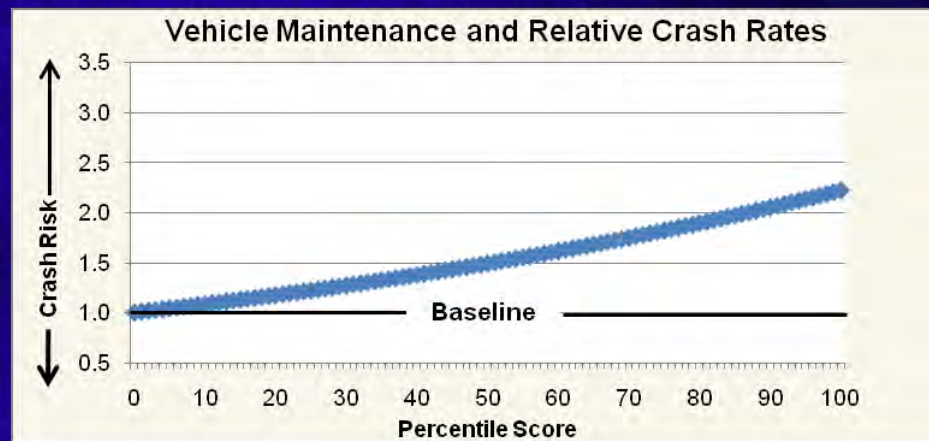
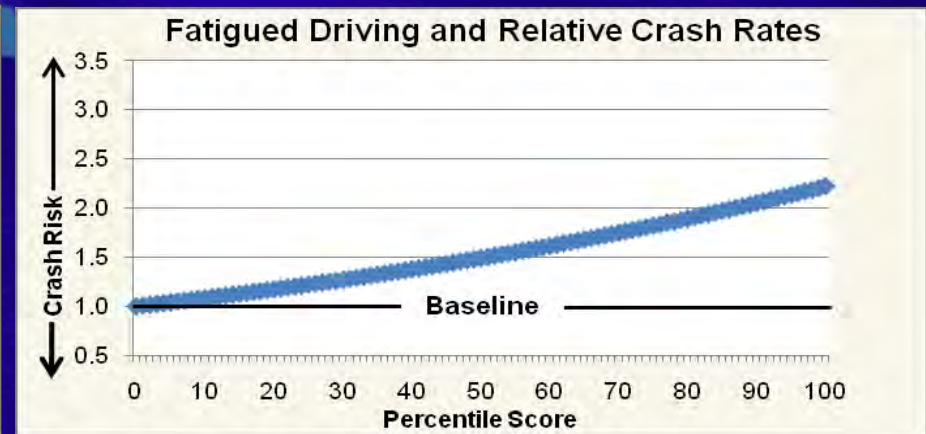
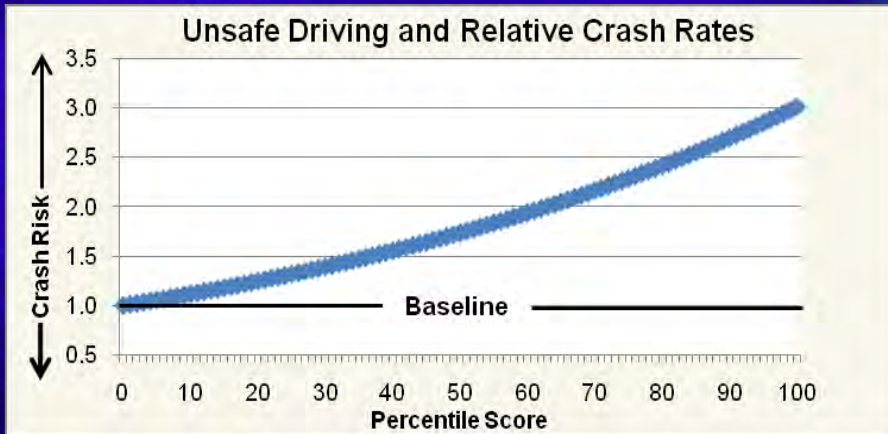


CSA Scores and Crash Risk

- What is the relationship of BASIC scores to crash risk?
- Analyzed percentile scores and alerts
- Similar findings in 2014 GAO report

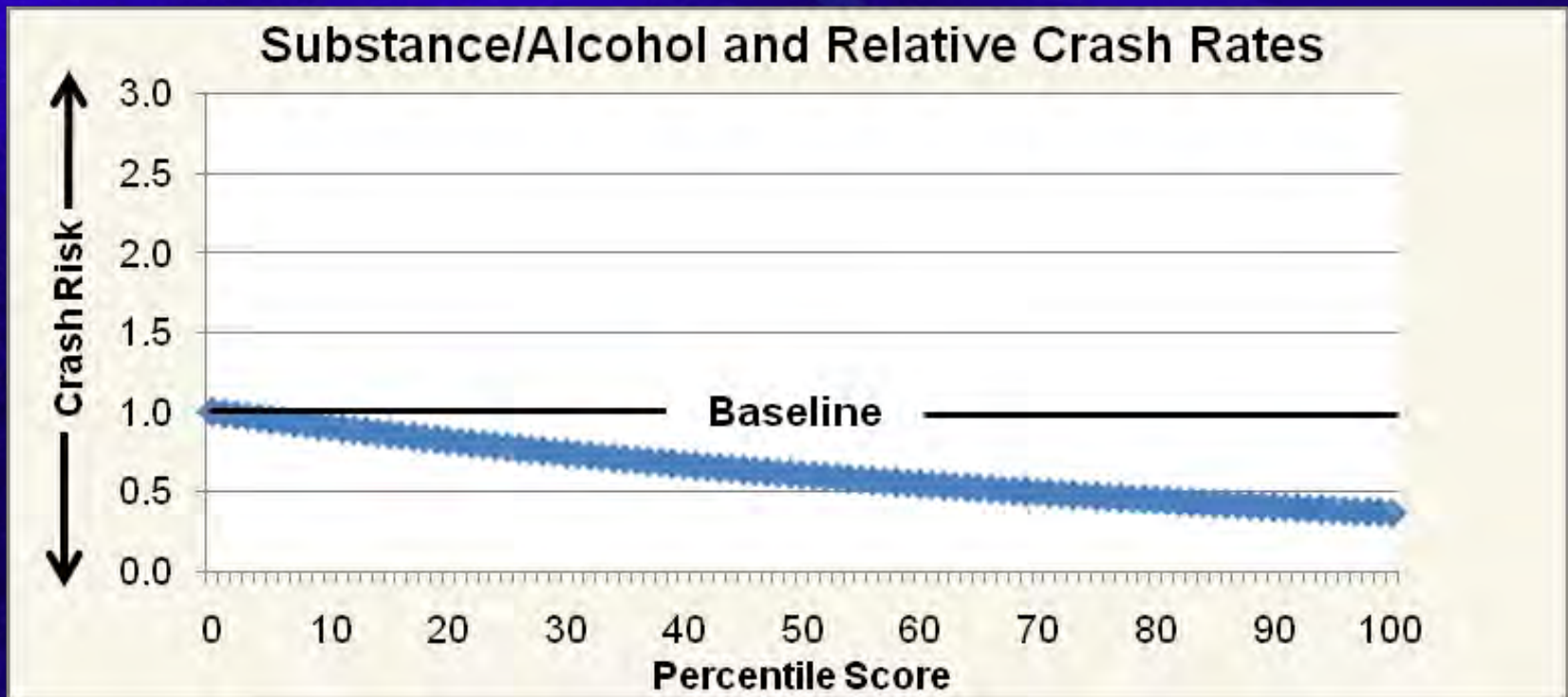


BASIC Scores and Crash Risk



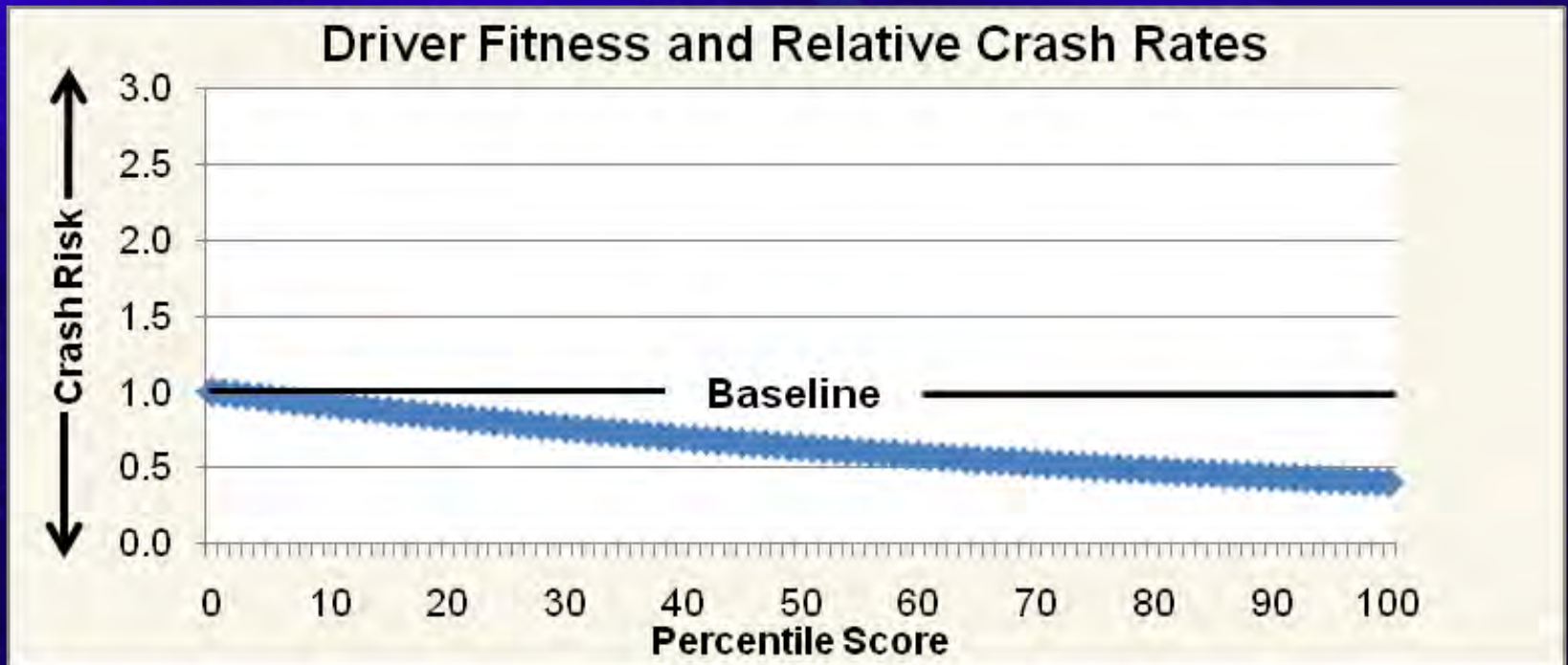
Controlled Substances/Alcohol

■ Percentile Scores and Crash Rates



Driver Fitness

- Percentile Scores and Crash Rates



Crash Accountability

- Top RAC priority 2013
- Analysis completed for 15 carriers using five crash types
 - ◆ Being hit by another driver who was under the influence of drugs or alcohol
 - ◆ Another driver running a stop sign or light and hitting your truck
 - ◆ Being hit while legally parked
 - ◆ Collisions with an animal in the roadway
 - ◆ Collisions involving a pedestrian attempting to commit suicide by truck

Assessing the Impact of Non-Preventable Crashes on CSA Scores

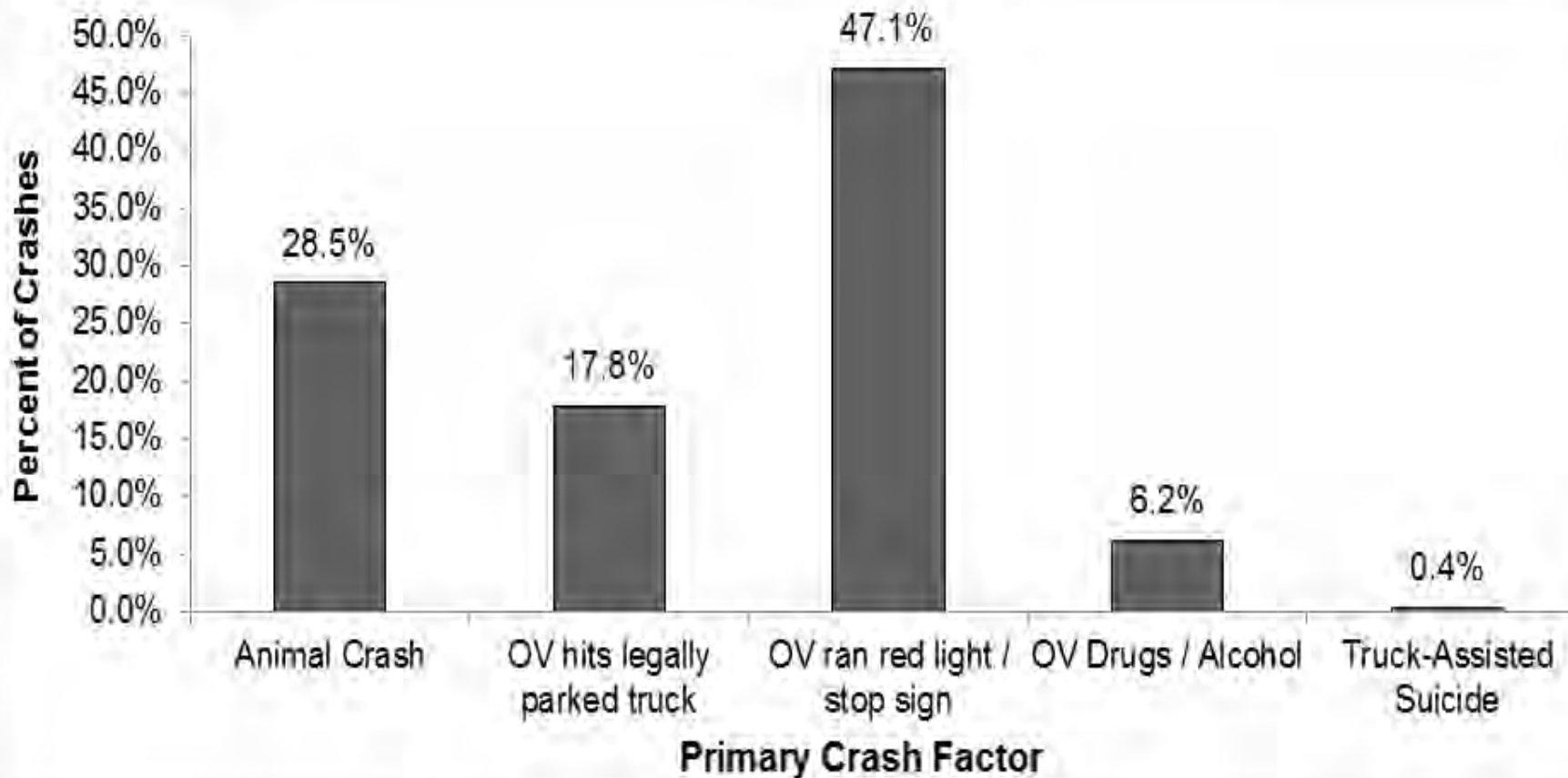
November 2015



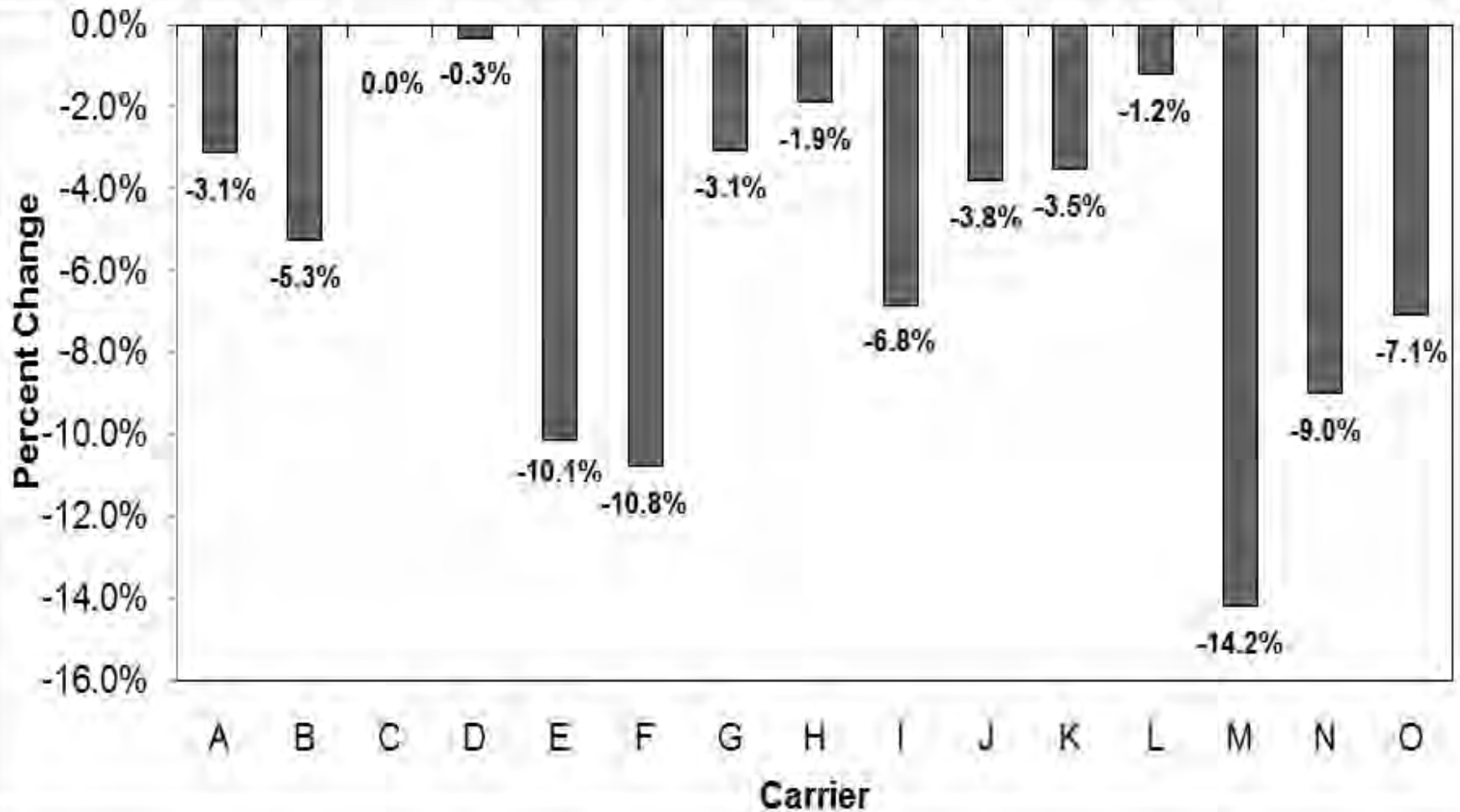
Prepared by the American Transportation Research Institute



Crash Accountability



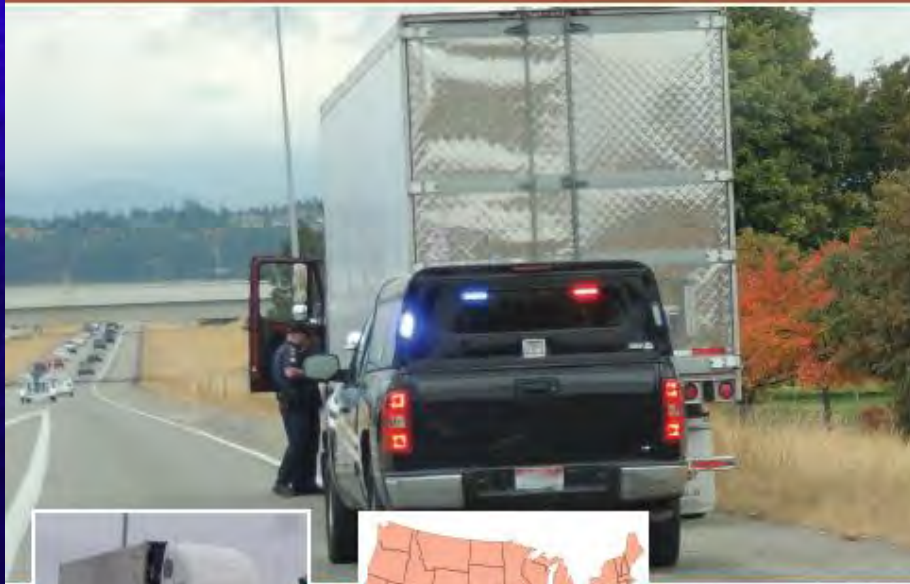
Crash Accountability



Enforcement Disparities

Evaluating the Impact of Commercial Motor Vehicle Enforcement Disparities on Carrier Safety Performance

July 2014



Prepared by the American Transportation Research Institute

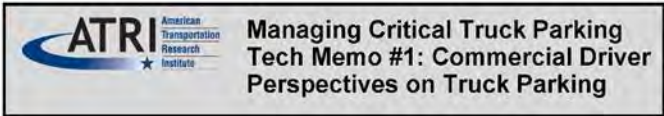


- Top RAC priority in 2013
- Quantitative and qualitative analysis of the impact of enforcement priorities on carrier CSA scores
- Disparate enforcement of safety regulations obscures actual carrier performance, relative to peers as measured by the SMS



Managing Critical Truck Parking

- Top RAC priority for 2015
- Research tasks include:
 - ◆ Driver data collection – yielded over 1,400 driver surveys
 - ◆ Utilizing truck GPS data to assess parking supply and demand
 - ◆ Benefit-cost analysis of truck parking reservation systems – impacts on productivity and safety
 - ◆ Impacts of lost capacity



September 2015


Caroline Boris
Research Analyst
American Transportation Research Institute
Minneapolis, MN


Matthew A. Johnson
Research Analyst
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Minneapolis, MN



Managing Critical Truck Parking

- Truck Parking Diaries
 - launched March 21st
- Drivers to keep 14 days of parking activity
- Includes when, where, how long to find a spot, how many spots occupied by non-CMV's, lost productivity


TRUCK DRIVER DAILY PARKING DIARY



Thank you for participating in this important research. Your input is critical to the success of this study.

Please follow the instructions inside to provide 14 days of truck parking activity before returning the completed diary to ATRI.

WWW.ATRI-ONLINE.ORG

Name: _____

Email: _____

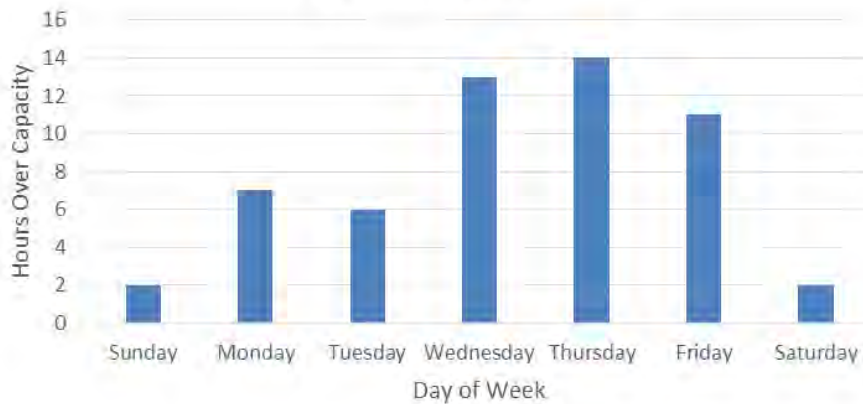
For questions or more information, contact ATRI at 770-432-0628 ext. 1 or ATRI@trucking.org.

Assessing Truck Parking Supply/Demand

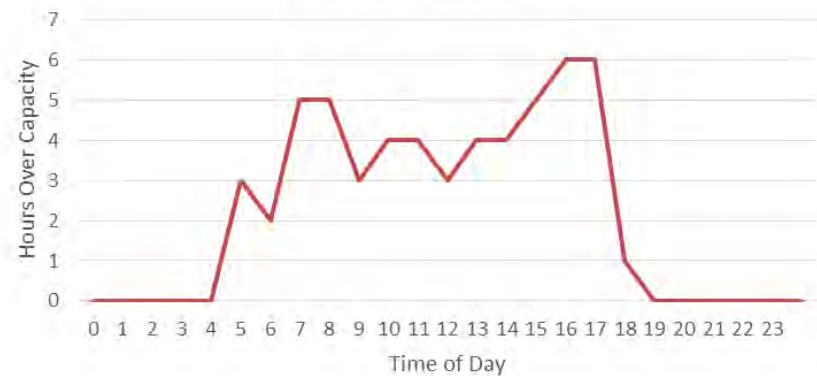
- Assess supply/demand utilizing ATRI truck GPS data
- Proof of concept with MnDOT
 - ◆ Analysis to include 5 rest areas
 - ◆ Goose Creek Rest Area analysis complete
- Created methodology to examine truck parking demand at public rest stops
- Findings can inform investment decisions

Managing Critical Truck Parking

Overcapacity by Day of Week
(October 2015)

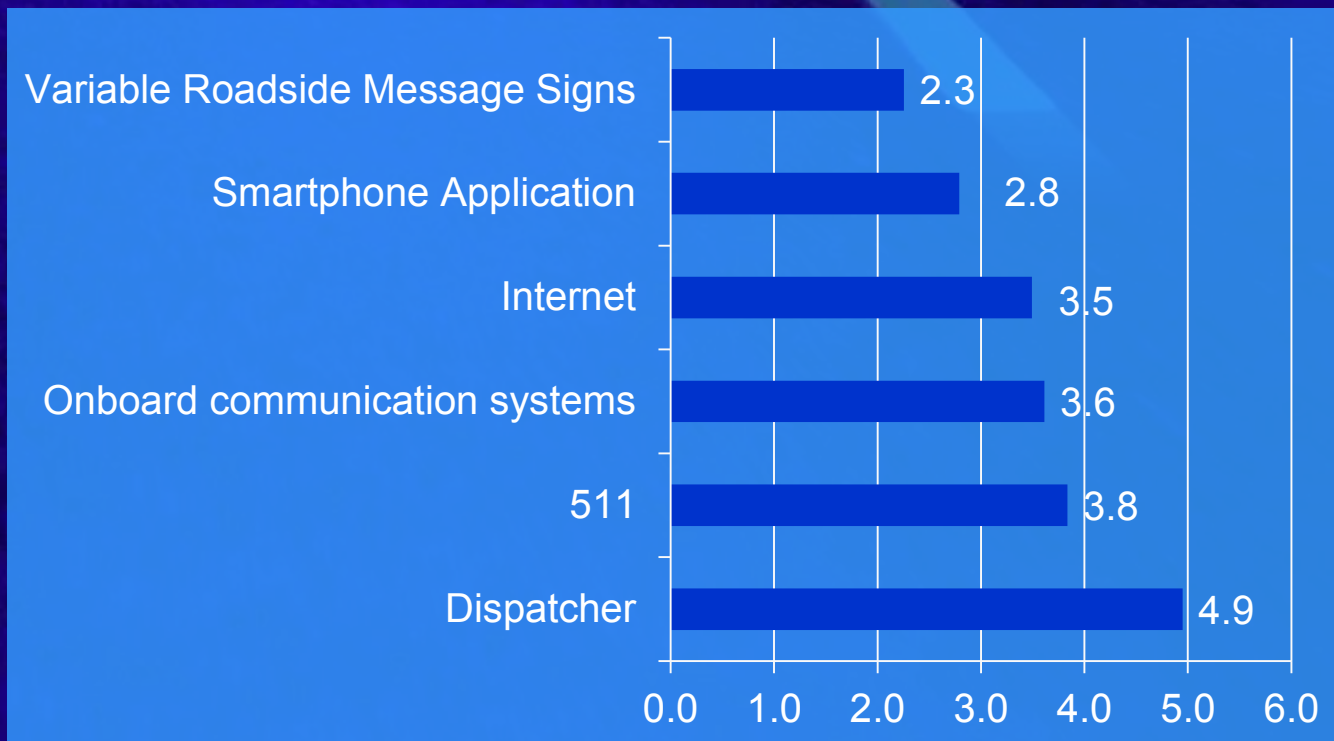


Overcapacity by Time of Day
(October 2015)



ATRI Truck Parking Survey Analysis

How would you like to receive truck parking information?



Freight Performance Measures

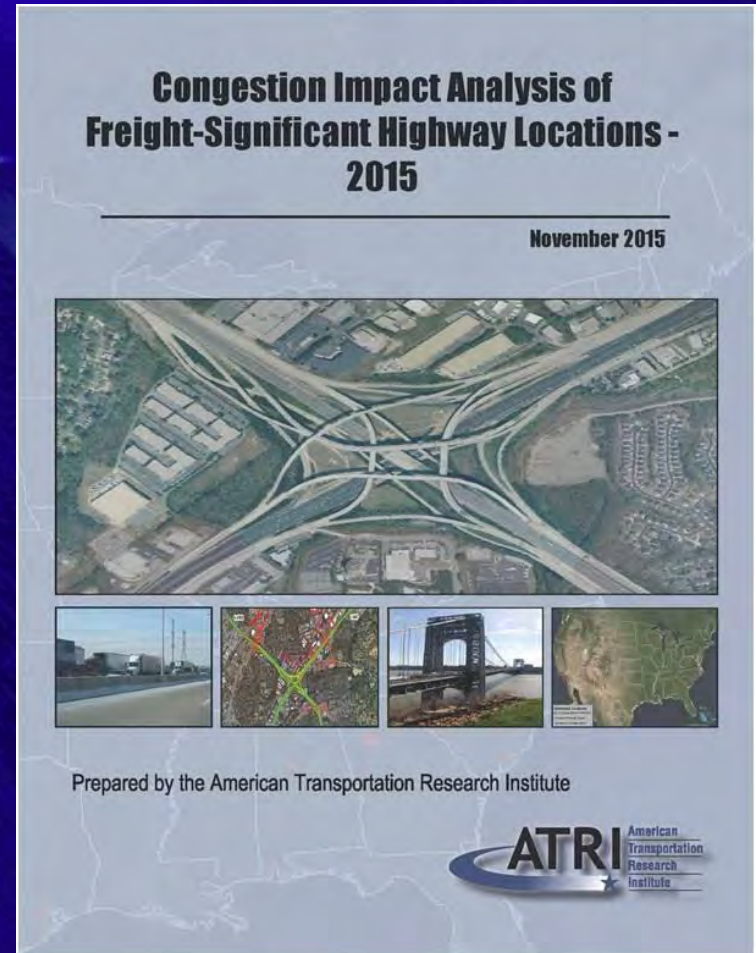
- Ongoing North American truck GPS data research started in 2001
- **“Big Data”**
 - ◆ Real-time data feeds/significant hardware and software
 - ◆ Currently near 100 million data points per day
 - ◆ Will approach 1 billion data points per week in 2016
- Key research areas
 - ◆ Economic competitiveness and supply chains
 - ◆ Truck volume/intensity/national travel patterns
 - ◆ Weather, parking, emergency events



Freight Bottleneck Analysis

- Ongoing monitoring of 250 truck freight-significant locations
- Avoiding/scheduling around truck freight congestion chokepoints

www.atri-online.org



2015 Top 10 Freight Bottlenecks

Rank	Location	Average Speed	2014 Rank	Change
1	Atlanta, GA: I-285 at I-85 (North)	40	3	+2
2	Chicago, IL: I-290 at I-90/I-94	27	2	0
3	Fort Lee, NJ: I-95 at SR 4	36	1	-2
4	Louisville, KY: I-65 at I-64/I-71	44	9	+5
5	Houston, TX: I-610 at US 290	38	6	+1
6	Houston, TX: I-10 at I-45	42	13	+7
7	Cincinnati, OH: I-71 at I-75	47	4	-3
8	Houston, TX: I-45 at US 59	39	5	-3
9	Los Angeles, CA: SR 60 at SR 57	45	8	-1
10	Houston, TX: I-10 at US 59	43	16	+6

Atlanta, GA: I-285 at I-85 (North)



Summary

National Ranking by Congestion Index	1
Average Speed	40
Peak Average Speed	28
Nonpeak Average Speed	47
Nonpeak/Peak Ratio	1.68

Average Speed by Time of Day
I-285 at I-85 (North)



Congestion Impact Analysis of Freight-Significant Highway Locations - 2015

Chicago, IL: I-290 at I-90/I-94



Summary

National Ranking by Congestion Index	2
Average Speed	27
Peak Average Speed	21
Nonpeak Average Speed	29
Nonpeak/Peak Ratio	1.38

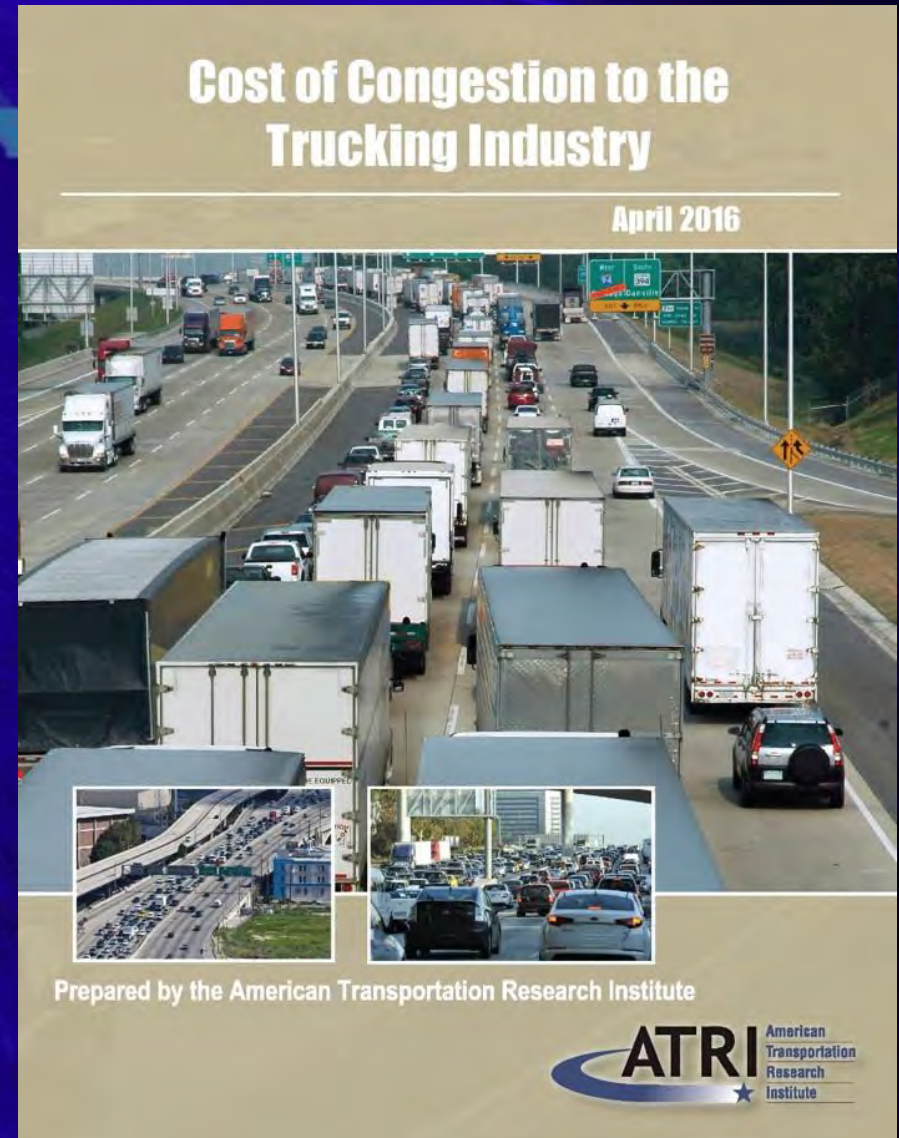
Average Speed by Time of Day
I-290 at I-90/I-94



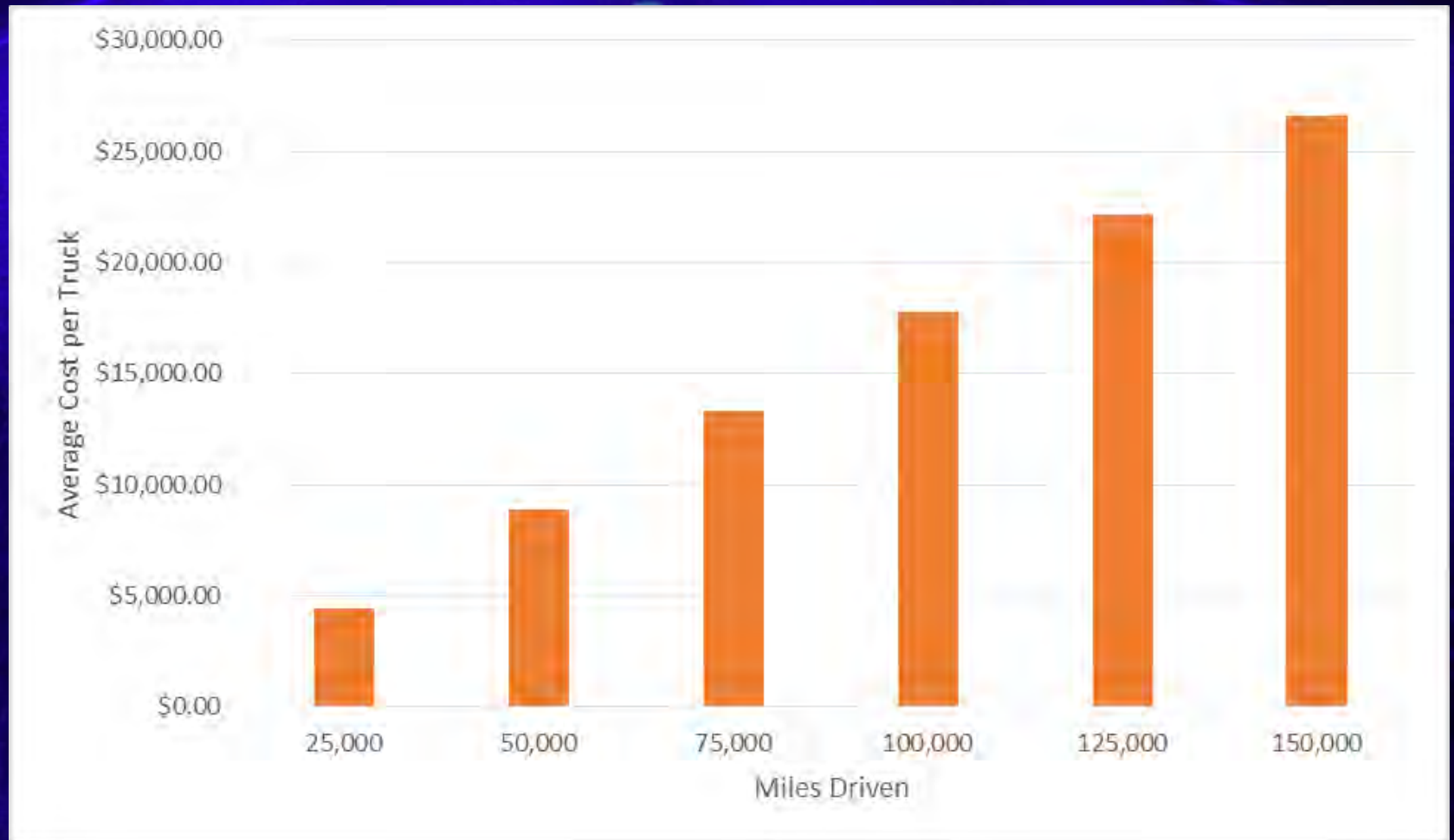
Congestion Impact Analysis of Freight-Significant Highway Locations - 2015

Cost of Congestion

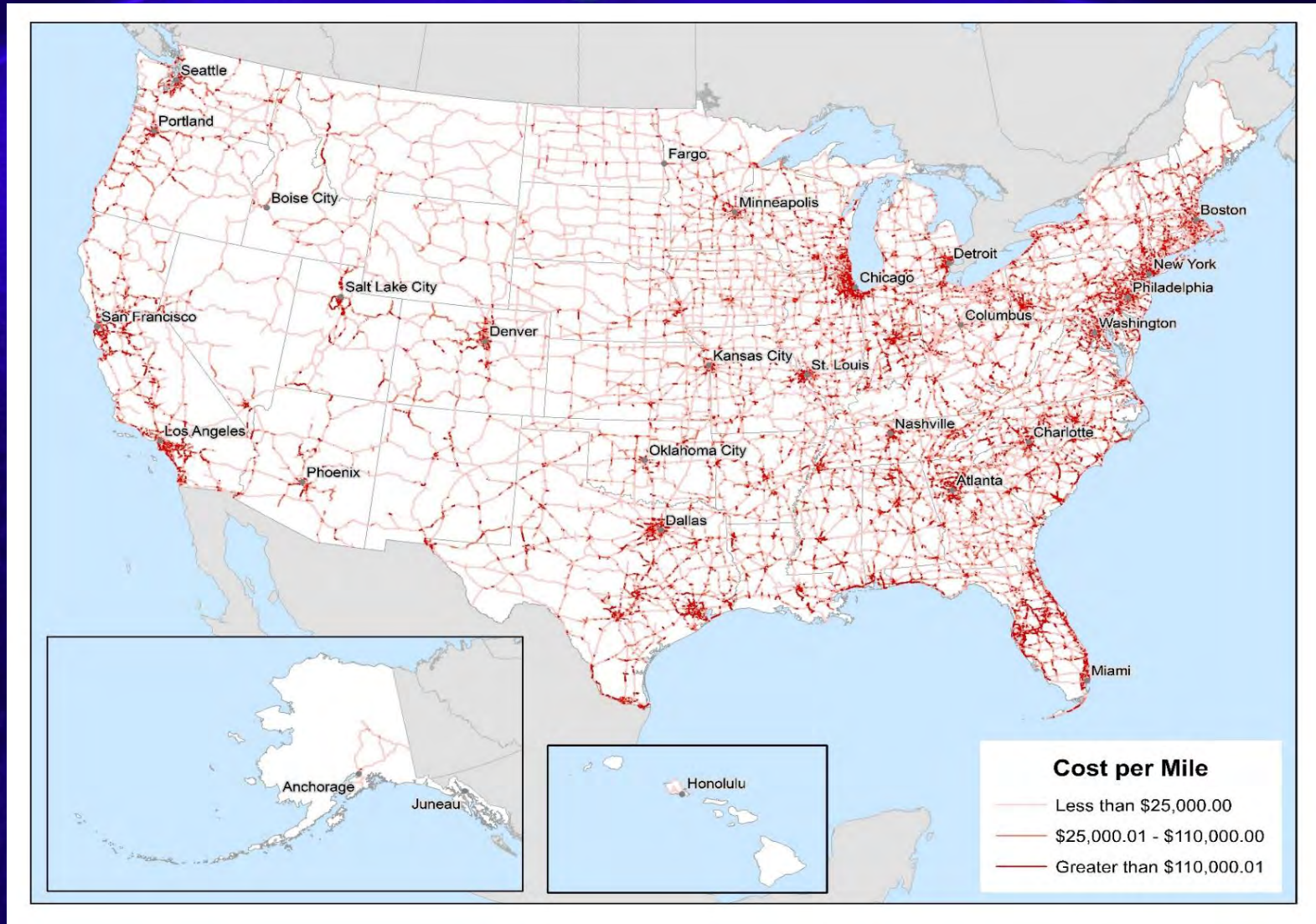
- Congestion on U.S. NHS cost trucking industry \$49.6B in 2014
- Lost productivity = 728 million hours
 - ◆ Equates to 264,500 commercial drivers sitting idle for entire year



Average Cost per Truck by Miles Driven



Cost of Congestion per NHS Segment Mile



Operational Costs of Trucking

- Annual report first issued in 2008
- Collects and analyzes real-world motor carrier operational data
- Calculates costs by mile and by hour

An Analysis of the Operational Costs of Trucking: 2015 Update

September 2015



Prepared by the American Transportation Research Institute



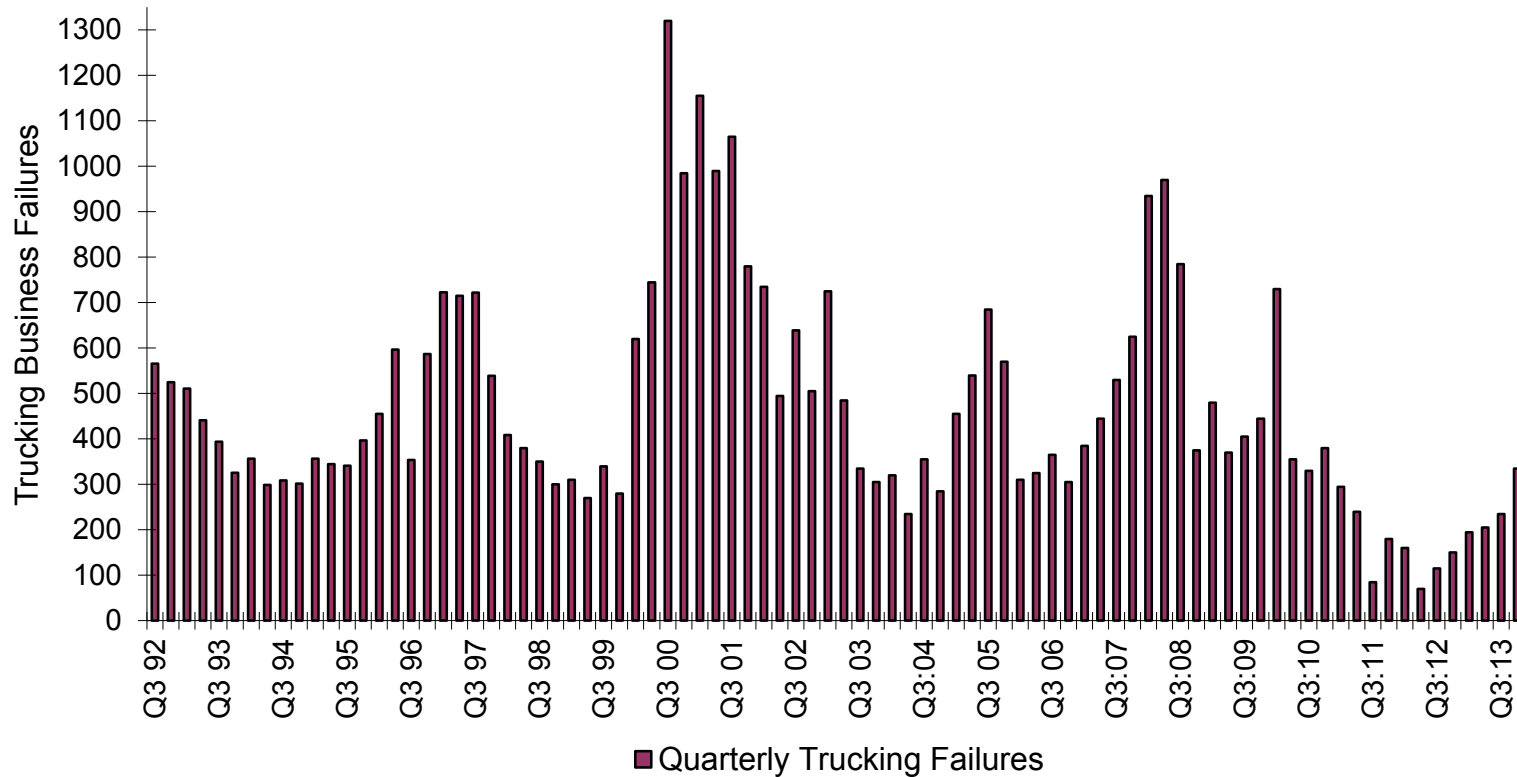
Operational Costs of Trucking

Average Carrier Costs per Mile

Motor Carrier Costs	2008	2009	2010	2011	2012	2013	2014
Vehicle-based							
Fuel Costs	\$0.633	\$0.405	\$0.486	\$0.590	\$0.641	\$0.645	\$0.583
Truck/Trailer Lease or Purchase Payments	\$0.213	\$0.257	\$0.184	\$0.189	\$0.174	\$0.163	\$0.215
Repair & Maintenance	\$0.103	\$0.123	\$0.124	\$0.152	\$0.138	\$0.148	\$0.158
Truck Insurance Premiums	\$0.055	\$0.054	\$0.059	\$0.067	\$0.063	\$0.064	\$0.071
Permits and Licenses	\$0.016	\$0.029	\$0.040	\$0.038	\$0.022	\$0.026	\$0.019
Tires	\$0.030	\$0.029	\$0.035	\$0.042	\$0.044	\$0.041	\$0.044
Tolls	\$0.024	\$0.024	\$0.012	\$0.017	\$0.019	\$0.019	\$0.023
Driver-based							
Driver Wages	\$0.435	\$0.403	\$0.446	\$0.460	\$0.417	\$0.440	\$0.462
Driver Benefits	\$0.144	\$0.128	\$0.162	\$0.151	\$0.116	\$0.129	\$0.129
TOTAL	\$1.653	\$1.451	\$1.548	\$1.706	\$1.633	\$1.676	\$1.703

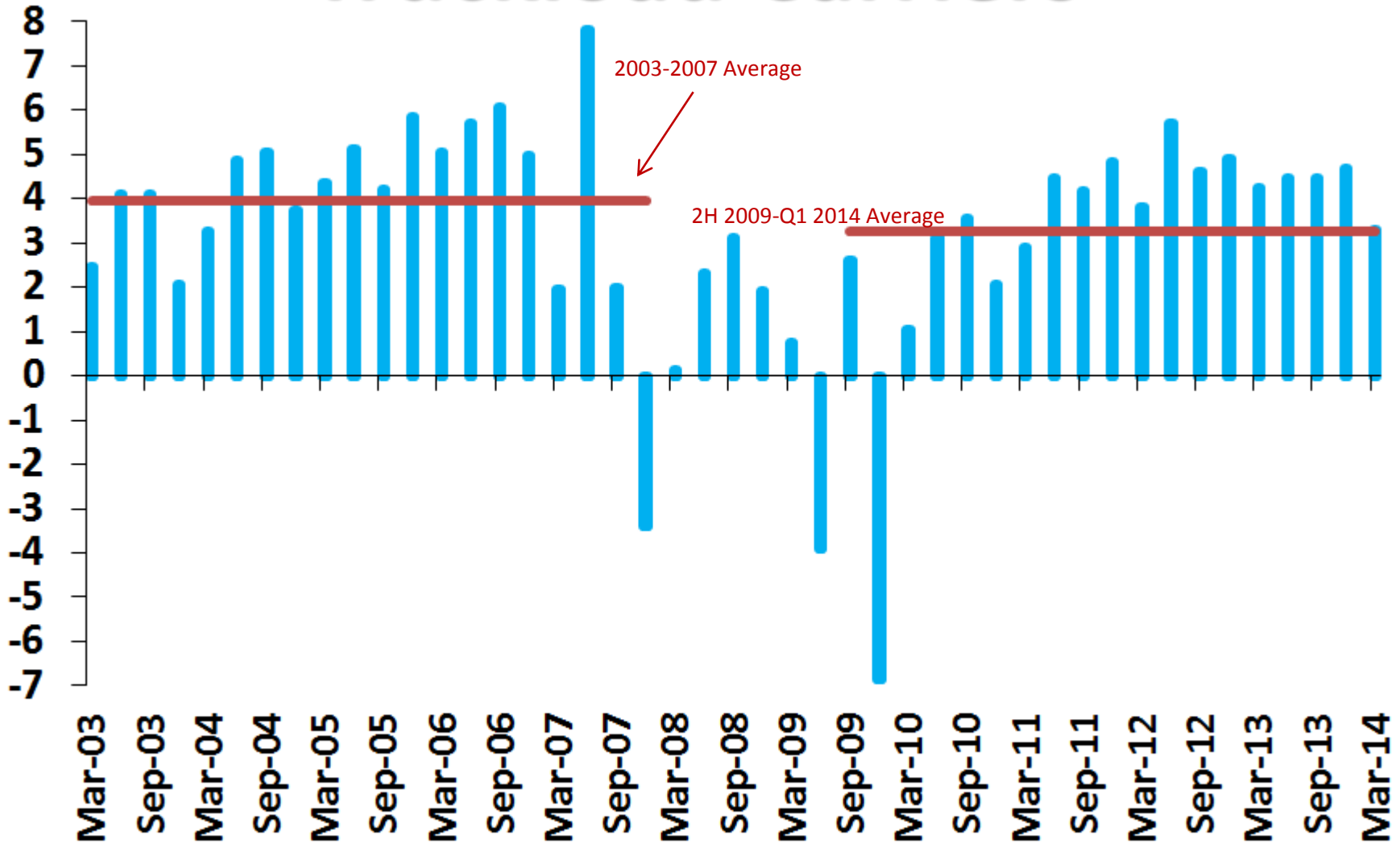
Trucking Business Failures

Total Trucking Business Failures
(Companies with 5 or more Trucks)
(Q3 1992 - Q4 2013)



Profit Margins of Publicly Traded Truckload Carriers

Percent



Source: ACT Research

2015 Top Research Priorities

Managing Critical Truck Parking - **Underway**

Onboard Safety Systems (OSS) Analysis

Phase 1 – Truck Crash Costs by Severity – **Underway**

Phase 2 – Deployment of OSS, Lives Saved, Injuries Avoided

Getting Younger Drivers in the Driver's Seat

Younger Driver Assessment Tool – **Underway**

Fixing the 12% – **Underway**

Baseline Class 8 Truck MPG – **Underway**

2016 Top Research Priorities

Effect of Autonomous Vehicles on the Trucking Industry

Beyond Compliance: Recognizing Safety Contributions

Safety Fitness Determination Impacts

Impacts of Commercial Driver Sleep Apnea Proposed
Rulemaking – **Underway**

Highway Funding Analysis 2016

Collision Avoidance Technology Deployment in Cars and Trucks

Standardizing State/Regional Freight Plans

Questions?

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www.atri-online.org

