Trucking Industry Research Initiatives

Rebecca M. Brewster President and COO American Transportation Research Institute



ATRI

Trucking industry's NFP research organization
Safety
Mobility
Economic Analysis
Technology
Environment

www.TruckingResearch.org





Research Advisory Committee



2018 Top Industry Issues

- 1. Driver Shortage (1)
- 2. Hours-of-Service (3)
- **3.** Driver Retention (5)
- 4. ELD Mandate (2)
- 5. Truck Parking (4)
- 6. CSA (6)
- 7. Driver Distraction (8)
- 8. Transportation Infrastructure /Congestion/ Funding (9)
- 9. Driver Health and Wellness (10)
- **10. Economy (11)**

CRITICAL ISSUES IN THE TRUCKING INDUSTRY - 2017



Presented to the American Trucking Associations

Prepared by The American Transportation Research Institute October 2017



950 North Glebe Road Arlington, VA 22203 (703)838-1966 <u>atri@trucking.org</u> <u>TruckingResearch.org</u>



Top Issues Drivers vs. Carriers

Commercial Drivers

- **1. Hours-of-Service**
- 2. Truck Parking
- 3. ELD Mandate
- 4. Driver Distraction
- **5. Driver Retention**
- 6. CSA
- 7. Driver Health/Wellness
- 8.Transportation7.Infrastructure / Congestion/8.Funding9.
- 9. Driver Shortage
- 10. Automated Truck Technology

Motor Carrier Execs

- **1. Driver Shortage**
- 2. Driver Retention
- **3. Hours-of-Service**
- 4. Transportation Infrastructure /Congestion/ Funding
- 5. ELD Mandate
- 6. CSA
- 7. Driver Distraction
 - Tort Reform
- 9. Truck Parking
- 10. Federal Preemption of State Regulation of Interstate Trucking (F4A)

Younger Driver Assessment Tool

Is it possible to identify younger individuals with the same characteristics of safe, older drivers?

 Prior studies focus on relationship between a <u>single</u> driver characteristic and safety outcomes

ATRI developed assessment tool to examine the relationship between multiple driver characteristics and safety outcomes



Developing a Younger Driver Assessment Tool Technical Memorandum #1

August 2017

Caroline Boris Research Analyst American Transportation Research Institute

Monica M. Luciana, Ph.D. Professor University of Minnesota Department of Psychology



Operational Costs of Trucking

Collects and analyzes real-world motor carrier operational data

- Covers data from 2008-2017
- Calculates costs by mile and by hour
- Sector, regional analyses included

An Analysis of the Operational Costs of Trucking: 2018 Update



Prepared by the American Transportation Research Institute





Operational Costs of Trucking

Average Carrier Costs per <u>Mile</u>

| Motor Carrier Costs | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---------|---------|---------|---------|---------|
| Vehicle-based | | | | | |
| Fuel Costs | \$0.645 | \$0.583 | \$0.403 | \$0.336 | \$0.368 |
| Truck/Trailer Lease or Purchase Payments | \$0.163 | \$0.215 | \$0.230 | \$0.255 | \$0.264 |
| Repair & Maintenance | \$0.148 | \$0.158 | \$0.156 | \$0.166 | \$0.167 |
| Truck Insurance Premiums | \$0.064 | \$0.071 | \$0.074 | \$0.075 | \$0.075 |
| Permits and Licenses | \$0.026 | \$0.019 | \$0.019 | \$0.022 | \$0.023 |
| Tires | \$0.041 | \$0.044 | \$0.043 | \$0.035 | \$0.038 |
| Tolls | \$0.019 | \$0.023 | \$0.020 | \$0.024 | \$0.027 |
| Driver-based | | | | | |
| Driver Wages | \$0.440 | \$0.462 | \$0.499 | \$0.523 | \$0.557 |
| Driver Benefits | \$0.129 | \$0.129 | \$0.131 | \$0.155 | \$0.172 |
| TOTAL | \$1.676 | \$1.703 | \$1.575 | \$1.592 | \$1.691 |



Cost of Congestion

Congestion on U.S. NHS cost trucking industry \$74.5B in 2016

Lost productivity = 1.2 billion hours

> Equates to 425,533 commercial drivers sitting idle for entire year

Cost of Congestion to the Trucking Industry: 2018 Update



Prepared by the American Transportation Research Institute



Hours-of-Service Flexibility

- Would flexibility in HOS rules provide opportunity to improve congestion?
- Depending on time of day – 40 mile trip can range from 40 minutes to over 93 minutes
- Cost for one trip ranges from \$42.32 to \$99.11





Two Trips Modeled Current HOS and 6/4 Split



HOS Flexibility Saves Time and \$\$

| Scenario | Drive Time | 14-Hour On-Duty Window |
|----------|-------------------|------------------------------|
| Current | 10 hr 45.5 min | 12 hr 45.5 min |
| Flexible | 10 hr 00 min | 11 hr 30 min |

Flex schedule driver logged 45.5 mins less drive time and 1 hr, 15.5 mins less on-duty time Similar results for 7/3 and 5/5 split



HOS Flexibility Saves Time and \$\$

If just 25 trips per day avoid ATL study segment at worst times due to flexibility = 4,700 fewer hours drive time annually saved

- Equates to cost savings of >\$300,000 per year for the 25-truck sample at one location
- Extrapolate to 500 congested locations nationally just 25 trips per location
 - 2.3 million hours drive time saved
 - Direct operating costs savings >\$150 million
 - Does not include societal benefits from decreases in truck-related congestion and more efficient supply chains



Crash Predictor 2018 Update

Analysis of over 435,000 driver records to identify behaviors (prior crashes, violations, convictions) most predictive of future crash involvement Updates earlier **Crash Predictor** Models from 2005

and 2011

t Marka

Prepared by the American Transportation Research Institute

Predicting Truck Crash Involvement:

2018 Update



July 2018

Top 10 Crash Predictor Behaviors

| If a driver had: | Crash likelihood increased: |
|---|--------------------------------|
| A Reckless Driving violation | 114% |
| A Failure to Yield Right of Way violation | 101% |
| A Failure to Keep in Proper Lane conviction | 83% |
| A Failure to Use / Improper Signal conviction | 82% |
| A Past Crash | 74% |
| An Improper Lane / Location conviction | 72% |
| An Improper Pass conviction | 70% |
| A Reckless / Careless / Inattentive / Negligent Driving conviction | 69% |
| An Improper or Erratic Lane Changes conviction | 66% |
| An Improper Lane Change violation | 63% |



Impact of Gender

 Female drivers safer than males in every statistically significant behavior
 Men 20% more

likely to be involved in crash than women

| Event | Relative to Females, Likelihood for Males Increased By: |
|---|---|
| Reckless / Careless / Inattentive / Negligent Driving conviction | 88% |
| Seat Belt violation | 78% |
| Failure to Obey Traffic Signal / Light conviction | 73% |
| Speeding 1-15 Miles Over Speed Limit conviction | 70% |



Past Crash Involvement by Age





Reckless/Careless/Inattentive/ Negligent Driving Convictions by Age



American Transportation Research Institute

Stable Predictors of Crash Risk

Across all three ATRI Crash Predictor Models, the top five stable predictors of crash risk are:

- **1.** A Past Crash
- 2. An Improper Lane / Location conviction
- **3.** A Reckless / Careless / Inattentive / Negligent Driving conviction
- 4. An Improper or Erratic Lane Changes conviction
- **5.** An Improper Lane Change violation



State Enforcement Analysis

| Rank | State | Traffic Enforcement Inspections | Percent | Crashes | Percent | Difference |
|--|-------|---------------------------------------|---------|---------|---------|------------|
| 1 | IN* | 31,023 | 8.31% | 4,833 | 3.45% | -4.86% |
| 2 | NM* | 13,800 | 3.70% | 725 | 0.52% | -3.18% |
| 3 | WA* | 14,058 | 3.77% | 1,624 | 1.16% | -2.61% |
| 4 | CA* | 37,318 | 9.99% | 10,755 | 7.68% | -2.32% |
| 5 | MD* | 12,967 | 3.47% | 2,083 | 1.49% | -1.99% |
| 6 | IA* | 9,795 | 2.62% | 1,794 | 1.28% | -1.34% |
| 7 | NV* | 5,105 | 1.37% | 360 | 0.26% | -1.11% |
| 8 | AZ* | 9,985 | 2.67% | 2,353 | 1.68% | -0.99% |
| 9 | KY* | 11,118 | 2.98% | 2,802 | 2.00% | -0.98% |
| 10 | IL | 21,673 | 5.80% | 7,080 | 5.05% | -0.75% |
| * One of the "Ten Tier" states in 2011 | | | | | | |

ATRI American Transportation Research Institute

Coming Soon

- 2019 Top 100 Truck Bottlenecks
- Younger Driver Assessment Tool
- Cannabis Intoxication Testing Best Practices
- Strategies for Managing Driver Shortage
- Detention Impacts on Safety and Productivity
- ELD Data Clearinghouse Analyses

www.TruckingResearch.org



Questions? Rebecca Brewster rbrewster@trucking.org 770-432-0628 www.TruckingResearch.org @ATRIPREZ

