501(c)3 NFP
Formerly ATA Foundation
Government & Industry Sponsors
Research Categories:
- Safety & Human Factors
- Technology & Training
- Environmental Factors
- Transportation Security
- Economic Analyses
Freight Industry Snapshot...

- 640,000 Trucking Companies
  - 10.1M employees; 3.2M truck drivers
  - 2.8 million large trucks; 20M commercial trucks
  - 4.9M trailers

- 6 Class 1 railroads; 550 Total
  - 1.2M freight cars
  - 200K employees
  - 170K miles of track

- 51 Deep Water Ports; 148 Total
  - 8000 ships
  - 12K miles of commercial waterways

- 12M – 20M Containers
  - Truck-Rail now fastest growing

- 75% air cargo moved by non-U.S. carriers
  - Fastest-growing sector over time
  - Expedited: Truck vs. airplane?
Key Realities

- Air Cargo…
  - Fastest Growing
  - Most Stays on the Ground?

- Rail
  - More Energy Efficient
  - Lower Emissions
  - Lower Cost
  - Highly Unreliable
  - Max Capacity
  - Intermodal Growth High
  - Poor Replacement for Truck System
Water/Maritime

- Barge Traffic Not Likely to Grow Substantially
- Maritime Relatively Insecure
- Labor Issues Problematic
Key Realities

- Trucking
  - Heavily Regulated
  - Highly Competitive
  - Safety Issues Complex
  - 68% of Tonnage; 86% of Revenue
Industry Snapshot: Freight Movement

- **Total Tonnage Moved:**
  
  2002 - 8.88 Billion Tons  
  2008 - 10.1 Billion Tons  

  ... A 13.7% increase in 6 years.

- **Trucking revenue represents 86.5% of all freight revenue**

U.S. Freight Transportation Forecast…To 2014
Top Industry Issues Survey

- Identify top concerns facing the industry over the next 5-10 years
- Based on 2000 responses
- Ongoing; allowing trend analyses
- Short- and long-term effects must be separately analyzed...
Top 10 Issues

1. Driver Shortage
2. Congestion
3. Tolls/ Highway Funding
4. Fuel Costs
5. Environmental Issues
6. Increasing Laws/ Mandates
7. Tort Reform
8. Hours-of-Service
9. Security
10. Insurance
Strategic Issues

- Insurance Costs
  - 20% - 50% increases for “good” carriers

- New Regulations: HOS; HM Endorsements, etc.

- Fuel Cost Volatility
  - Jan. ’02 - $1.16/Gallon
  - Oct. ‘04 - $2.20/Gallon
  - May ’06 - $2.89/Gallon
Insurance Cost per Truck

Data based on publicly held truckload carriers which disclose this information.
Higher Diesel Prices Lead To More Trucking Failures

- **Total Trucking Failures**
- **Average National Diesel Prices**
Strategic Issues

- Driver Issues
  - Shortage (140%)
    - Turn-over vs. Churning
  - HOS
  - Heated Economy & Wage Increases
  - Looming Retirements

- Technology Utilization
  - Haves vs. Have-Nots
    - Growing; Faster Among Large Carriers
Driver Shortage
Long-haul TL Drivers

Source: Global Insight, Inc. for ATA
Truckload Driver Turnover
(Quarterly Annualized Rates)

- 2004 Average
- 1st Quarter 2005 Rate

Source: ATA’s Trucking Activity Report
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<th>100+ Power Units</th>
<th>10-100 Power Units</th>
<th>1-9 Power Units</th>
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<td>100+ POWER UNITS</td>
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Strategic Issues

- Congestion
  - Driving trucks to alternative routes
  - Impairing economic growth
  - No new capacity

- Shipper-Carrier Relationships
  - Root of many problems
  - Contract requirement issues
  - Competition hurts

- Security Costs??
Research Landscape

- **Basic vs. Applied**
  - Role of Academia
  - Partnerships allow for Applied Knowledge Gap

- **Data Privacy**
  - FOI A/CI PSEA/HIPAA
  - Tight NDAs Needed

- **Academic Costs Relatively High**
Research Landscape Cont’d

- Federal Funding Substantial
- Funding Sources & Requirements Complex
- Earmarks Large
- Consultants are Everywhere
  - GSA et al
Environmental Issues

- Fuel Efficiency
- Boutique Fuels
- Emissions
- Idling
- Alternative Fuels
- Policy: Efficiency vs. E-Friendly Conflicts

Sponsors: DOE; EPA; ??
Labor Issues

- Driver Shortages
- Driver Sources/Resources
- Compensation Issues
- Human Factor Research

Interested Sponsors: DOL, NIOSH, DOC, FMCSA
Safety Issues

- HOS
- Safety Technologies
  - Roles, Costs, Mandates, Efficacy
- Health & Wellness Issues
- Safe Driver Attributes
- Policy Issues (DP, Mgmt., etc.)
- Regulatory Effectiveness

Interested Sponsors: FMCSA, FHWA, NHTSA, CDC, OSHA
Productivity/Economics

- Competitive Environment Issues
  - S&D, Gov’t Intervention
- External Factors
- Managing Distribution Systems
- SCM Inefficiencies
  - Tech vs. Processes
- Truck Size & Weight

Interested Sponsors: FHWA, DOC, DOL, Assns, SAE
Technology Issues

- Lack of Interoperability
- Lack of Standards
- Data Privacy/Control
- Financial Issues
  - Depreciation/Obsolescence/Innovator Effect
- Bandwidth

Interested Sponsors: FMCSA, FHWA, NHTSA, CDC, OSHA, NIST, SAE
Security Issues

- Complex
  - Deterrence/Detection/Defense/Recovery
- Poorly Defined
  - TRB Report
- Too Many Widgets
- Lack of Operational Knowledge
- Areas of Interest: HM; Containers, Air Cargo, Borders

Interested Sponsors: DHS; TSA; CBP; U.S. DOT
Other Issues

- Institutional/Legal
- Vehicle Design/Configuration
- Transportation Planning & Funding
  - Jurisdictions
Current Research

Safety and Human Factors
ENS Pilot Test
Driving Simulator Evaluation
CMV Enforcement Effectiveness
Safety and Productivity of New HOS
Work Zone Safety

Safety and Human Factors
Fatigue Management Technologies
Traffic Incident Management Focus States Initiative
Traffic Incident Management Self-Assessment
Current Research

Technology and Innovation
Data Privacy
Freight Performance Measures
Freight Information Highway
EAD Safety Technologies

Technology and Innovation
Integrated Vehicle-Based Safety Systems
Safety Technology Survey Synthesis
Brake Maintenance Certification

American Transportation Research Institute
Current Research

Environmental Factors
Idling Preferences Survey
Idling Regulations Compendium
Idle Reduction Technologies
Economic Analysis
Highway Funding Analysis
Capacity Crisis
Freight Capacity Model

Transportation Security
ITS Security Curriculum Development
Homeland Security and The Trucking Industry
National HazMat Ops Test
ACE Border Analysis/Cross-Border Programs Assessment
CMV Enforcement

Predicting Truck Crash Involvement - A Commercial Driver Behavior-Based Indicator

- Prior research, including LTCCS, points to driver-related factors as critical reason for crashes
- Focusing on driver behaviors will have most profound impact on crash reduction
CMV Enforcement

Research uses data from MCMIS and CDLI S to look at roadside inspections, crashes and convictions.

Analyses focus on whether there is a significant difference in future crash rates for drivers based on past roadside inspection, violations, conviction and/or crash information.
CMV Enforcement

Preliminary Findings...

- Percent increase in crash likelihood from citations related to:
  - Reckless driving- 325%
  - Improper turns- 105%
  - Improper lane changes- 78%
  - Failure to yield ROW- 70%
  - Following too closely- 40%
  - Speeding- 35%
CMV Enforcement

Preliminary Findings...

- Percent increase in crash likelihood from convictions related to:
  - Improper or erratic lane change- 100%
  - Speeding- 97%
  - Following too closely- 50%

- Percent increase in likelihood of future crash by drivers who had a past crash- 87%
CMV Enforcement

Additional Analysis:

- States with greater enforcement activity and lower crash rates have been identified statistically as “Top Tier States”

- Enforcement actions from those states being analyzed as best practices to mitigate the driver events/behaviors identified
Hours-of-Service

The Safety and Productivity Impacts of the New HOS

- Compares 2003 impacts to 2004 (pre- and post-new HOS)
- Includes survey of 1,000 TL & LTL drivers
Hours-of-Service

DATASET:

- Over 100,000 drivers
- Over 97,000 trucks
- Over 10.5 billion fuel tax miles
Hours-of-Service

Preliminary Findings 2004 over 2003:

- Reduction in collision rate per million miles of 3.7%
- Reduction in preventable collision rate per million miles of 4.8%
Hours-of-Service

Preliminary Findings 2004 over 2003:

- Reduction in injury rate per million miles of **12.6%**

- Reduction in collision-related injury rate per million miles of **7.6%**
Hours-of-Service

Driver Survey Results:
Are you more or less fatigued under new rules?
- 46% Less
- 23% No change
- 31% More

Have the new rules made your driving job easier or harder?
- 45% Easier
- 17% No change
- 38% Harder
Hours of Service

Driver Survey Results
Which provision do you like the most? least?

- 34 Hour Restart: Most (60%) Least (10%)
- 11 Hours Driving: Most (20%) Least (20%)
- 10 Hours Off: Most (30%) Least (30%)
- 14 Hour Rule: Most (50%) Least (0%)
Capacity Crisis

- Scoping Study Underway
  - Developing relationships, data/ metrics and assumptions
    - Metrics will address truck size & quantities, VMTs, congestion, tonnage, emissions. Intermodal diversion?
  - Working with ARRB Transport Research Research
  - Steering Committee in development; includes FHWA
  - Issue: should final scoping study be converted to FHWA proposal?
Homeland Security and The Trucking Industry

- Study commissioned by OEM; managed by U of MN and authored by ATRI
- Large-scale analysis of industry factors and externalities and their relationship to security
- Documents Security ROIs
- Includes focus on biometrics, e-seals and smart cards
- Public distribution after July 7
- “Excellent study that will be broadly disseminated throughout International…”
DP Concerns in the Freight Industries...

1. Civil Litigation/TL
2. Competitive Access
3. Gov’t Sharing
   - FOIA
   - CI PSEA
   - Privacy Act of 1974
Security: Data Privacy Issue

- Regulatory Costs
- Functional Solutions Needed
- Lack of Security ROI
- Lack of National Plan
Data Privacy Issues in ITS

1. Technical Issues
   1. Engineers Don’t Care about DP
   2. Legal/I.I. Issues
And its Getting Worse

- Sarbanes-Oxley Requirements
- ID Cards
- Airline-Gov’t Cooperation
- DOJ : Microsoft/Yahoo vs. Google
- E-Mail Discovery

Impacts ALL Research!
Phase 3 Wrapping Up

- 25 Corridors
- 2/3rds of IS
- 12 Months of Data Collected
- Border Collections underway
- Weather Analysis
- Automated Processing Capability
- State & MPO Reviews
- Web-based queries?
Average Travel Rate for Trucks
July 2005, 10 Mile Segments

Legend
JULY Events
Speed_MPH
- 00 - 40
- 40 - 45
- 45 - 50
- 50 - 55
- 55 - 60
- 60+++
Geographic Impediments
Weather Documentation
Corridor Data Based on March 19, 2003
From 12:00pm - 4:00pm PST
Truck Speed Calculation Based on 50-mile increments

Corridor’s included in analysis are (I5, I10, I45, I65, I70)

Legend

Speed_MPH

- Red: 0 - 15
- Orange: 15 - 30
- Green: 30 - 45
- Yellow: 45 - 55+
July 2005 Average Travel Rates with Average Annual July Rainfall Totals

Average July Rainfall

PREC0107
GRID CODE
- < .51 Inches
- 0.51 - 1.00 Inches
- 1.01 - 1.50 Inches
- 1.51 - 2.00 Inches
- 2.01 - 3.00 Inches
- 3.01 - 5.00 Inches
- 5.01 - 10.00 Inches

Average July Truck Travel Rates

TrkSpeed_by_Dist_l70jul Events

Speed MPH
- 0 - 40
- 40 - 45
- 45 - 50
- 50 - 55
- 55 +++
Global Connectivity: are we up against?

- Major increase in passenger and freight demand.
- Freight increase of 70% by 2020.
- Current planning and financing methods do not adequately address freight’s unique concerns.
- Intermodal linkages not seamless.
- Increased focus on safety and environmental issues.
- US economic competitiveness at stake.
- Security needs continue to challenge productivity.
- Reliability & visibility of shipments
Shipper Perspectives on Air Cargo

Most important provider attribute:

- Service reliability: 43%
- Rates: 27%
- Transit Times: 19%

International Logistics Quality Institute, 2003 Survey of 820 Shippers
UEFM History...

- Chicago O’Hare Air Cargo Security System
- Electronic Supply Chain Manifest Initiative
- IFTWG Projects
  - Freight Information Highway Phase 1
  - Intermodal Data Systems
Freight Information Highway

What is it?

- An information pipeline linking supply chain participants through secure authentication.
- Provides a mechanism for all trading partners in the supply chain to communicate interactively.
- Not a DATA REPOSITORY but a conduit to exchange vital information.
Typical Supply Chain Data Scenario

*Disparate Legacy Systems*

Each System Requiring Direct Connections to Support
Data Collaboration between Supply Chain Partners
Freight Information Highway

A framework of virtual connections allowing complete collaboration between supply chain partners
ENS Project Background

- Grew from the results of the FMCSA-sponsored Driver Violation Notification (DVN) project ("Phase I")
  - Analyzed drivers’ histories and their relationship to highway safety
  - Identified potential gaps in driver compliance with Federal requirements
  - Identified significant potential safety benefits of ENS system
  - Identified potential cost savings for jurisdictions and industry
  - Defined high-level ENS system requirements
ENS Phase II Pilot Test Overview

- **Title:** Employer Notification System (ENS) Prototype
  1. Develop study design and performance measures
  2. Build and test prototype ENS
  3. Select Pilot States and Motor Carriers
  4. Develop and deploy prototype system in Pilot States
  5. Conduct Pilot Test
  6. Evaluate and document results of the Pilot Test

- **Sponsor:** FMCSA/DOT
- **Period of Performance:** 9/8/04 – 3/07/07
- **Two Pilot States:** California and Colorado
Some MC require notification of violations

Annual driver histories provide MC with conviction notices (some MCs pull DHRs quarterly or semiannually)

Interviews suggest that 50%-80% of the drivers do notify employers within the currently required 30 days of convictions

Employer notified

30 days

0

0.2

0.4

0.6

0.8

1.0

Probability Employer is Notified

Violation & Citation

Adjudication

Conviction Posted to DHR

Months After Conviction Posting to DHR
MORE INFORMATION

Dan Murray
Dmurray@trucking.org

www.atri-online.org