Federal Motor Carrier Safety Administration
Office of Analysis, Research and Technology

Onboard Safety System Deployment Program

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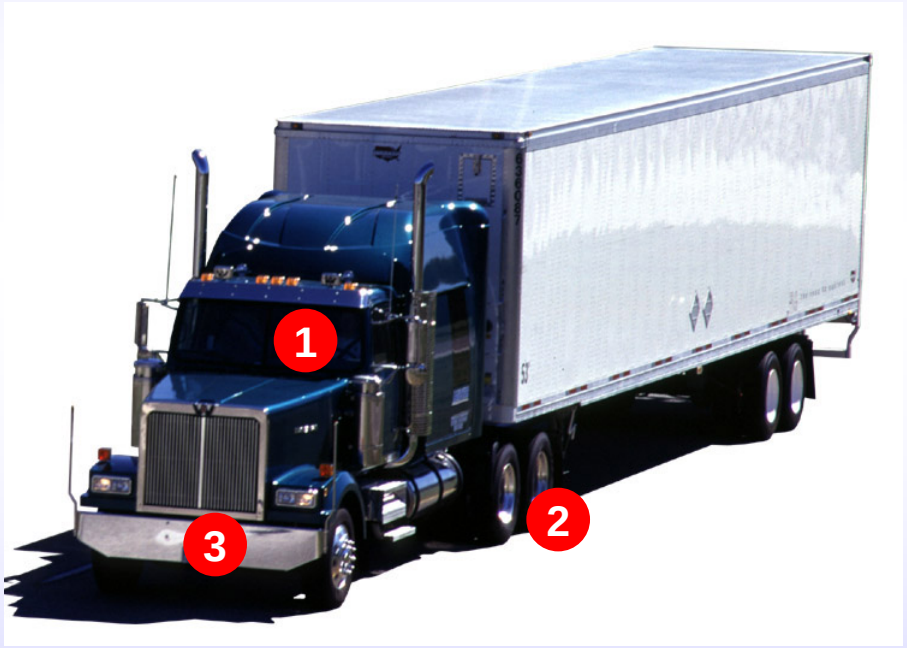
ART Forum

Deployment Goal

Improve commercial motor vehicle safety through the accelerated deployment and increased use of effective onboard safety systems

Onboard Safety Systems



1. Lane Departure Warning (LDWS)
2. Roll Stability Control (RSC) and Electronic Stability Control (ESC)
3. Forward Collision Warning (FCWS)

New Onboard Safety System Trends

- Integrated Vehicle-Based Systems
  - Lane Departure, Side Collision, and Forward Collision Warning
- Collision Mitigation Systems
  - Adaptive Cruise Control
  - Brake Intervention
- On-board Monitoring with Mobile Communications Systems
  - Hard Braking
  - Vehicle Stability Sensors

Top Purchasing Decision Factors

- Proven system accuracy, reliability, and effectiveness
- Costs of initial purchase, installation, maintenance, and driver training
- Availability of system and technical support from truck manufacturers
- Protection of recorded vehicle data
- Ability to monitor driver behavior via onboard data

Deployment Program

- Work in partnership opportunities with stakeholders
- Support decision-making by providing additional information and data
  - Voluntary functional specifications
  - Motor carrier recommended practices
  - FMCSA website technology product guides
  - Webinars featuring carrier experiences and best practices
  - Onboard safety technology survey

Deployment Program

- Develop future testing plans for more rigorous evaluations in partnership with carriers
- Conduct an Industry Demographics Analysis
  - Economic, safety, and operational characteristics
  - Small carrier and owner operator independent driver emphasis
- Compute costs and benefits for industry

Benefit Cost Analysis

- Crash Prevention
  - General Estimates System crash data: 2001 – 2005
  - Large Truck Crash Causation Study data: 2001 – 2003
  - Field operational tests (FOTs)
  - Motor carrier crash data
- Crash Cost Savings from Avoided Crashes
  - Motor carrier data
  - Insurance industry data

Rear-end Crashes Preventable by Forward Collision Warning Systems

41,000 (~67% PDO) rear-end collisions where the truck strikes a slower moving or stopped vehicle

Volvo FOT of Forward Collision Warning Systems

- Estimated 21% reduction of rear-end collisions
- Helped drivers maintain longer following distances between their vehicle and a vehicle in front of them
- Warned the driver in advance to detect a dangerous situation and brake earlier to enhance crash prevention
- Was most effective at reducing rear-end conflicts when the truck was traveling at higher speeds (> 55 mph)

Same or Opposite Direction Lane Departure Sideswipes Preventable by Lane Departure Warning Systems

~9,000 (~88% PDO) sideswipes when the truck travels over the travel lane

Single Vehicle Roadway Departure Collisions Preventable by Lane Departure Warning Systems

~3,000 (~44% PDO) SVRD rollovers

~5,000 (~78% PDO) SVRD collisions with a fixed object

Opposite Direction Lane Departure Head-on Crashes Preventable by Lane Departure Warning Systems

~300 (~38% PDO) head-on collisions when the truck travels over the travel lane

Mack FOT of Lane Departure Warning Systems

- Estimated 21% to 23% reduction in single vehicle roadway departure crashes
- Estimated 17% to 24% reduction in rollover crashes
- Improved safety-related driving behavior by decreasing unintended lane excursions
- Economically justified for tractor-tanker applications

Rollovers due to Excessive Speed in a Curve Preventable by Stability Control Systems

~4,000 (~42% PDO) rollovers in a curve

Freightliner FOT of Roll Stability Control Systems

- Estimated 20% reduction of rollover crashes caused by driving too fast in a curve with system tested in 2003
- According to computer simulations of the currently available more advanced roll stability control system, it was estimated to prevent about 53% of rollovers resulting from excessive speed in a curve

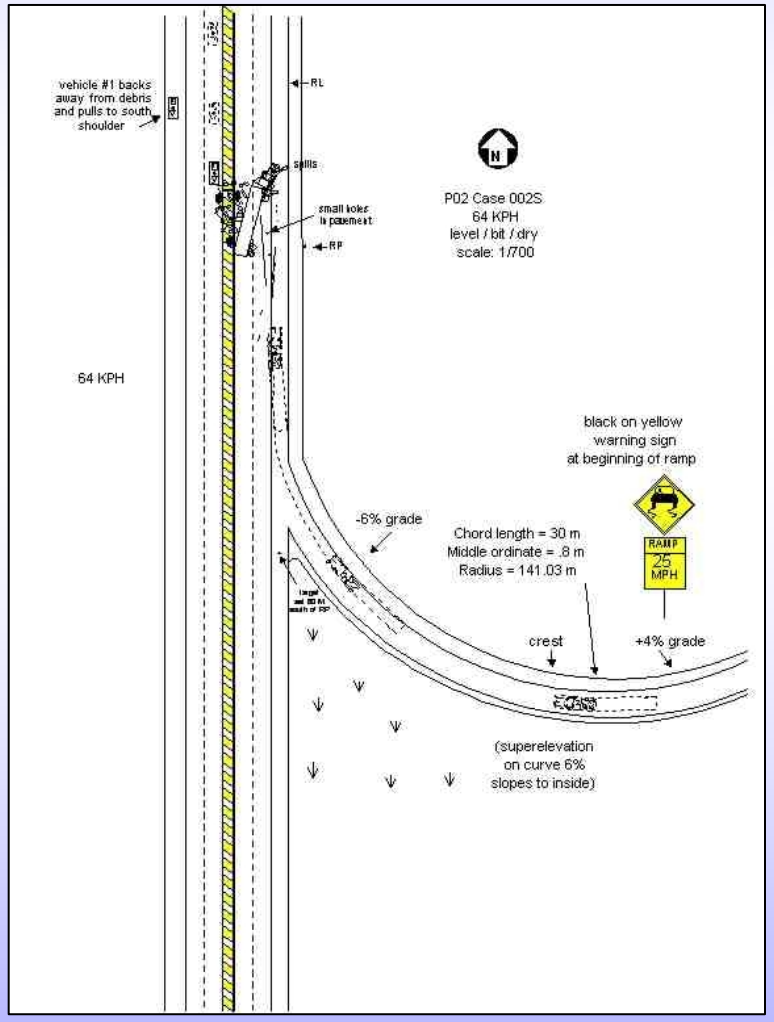
Jackknifes due to Skidding Laterally Preventable by Electronic Stability Control Systems

~4,000 (~66 % PDO) jackknifes due to loss of control

Crash Costs Dependent on Crash Type

- Labor (Training, testing, hiring, orientation, recruitment, worker's compensation)
- Operational (Cargo damage, delivery delays, loading and unloading cargo, towing, inventory, storage)
- Environmental (Fines, clean-up)
- Property damage
- Injury
- Fatality
- Legal (Court and legal fees, out-of-pocket settlements)

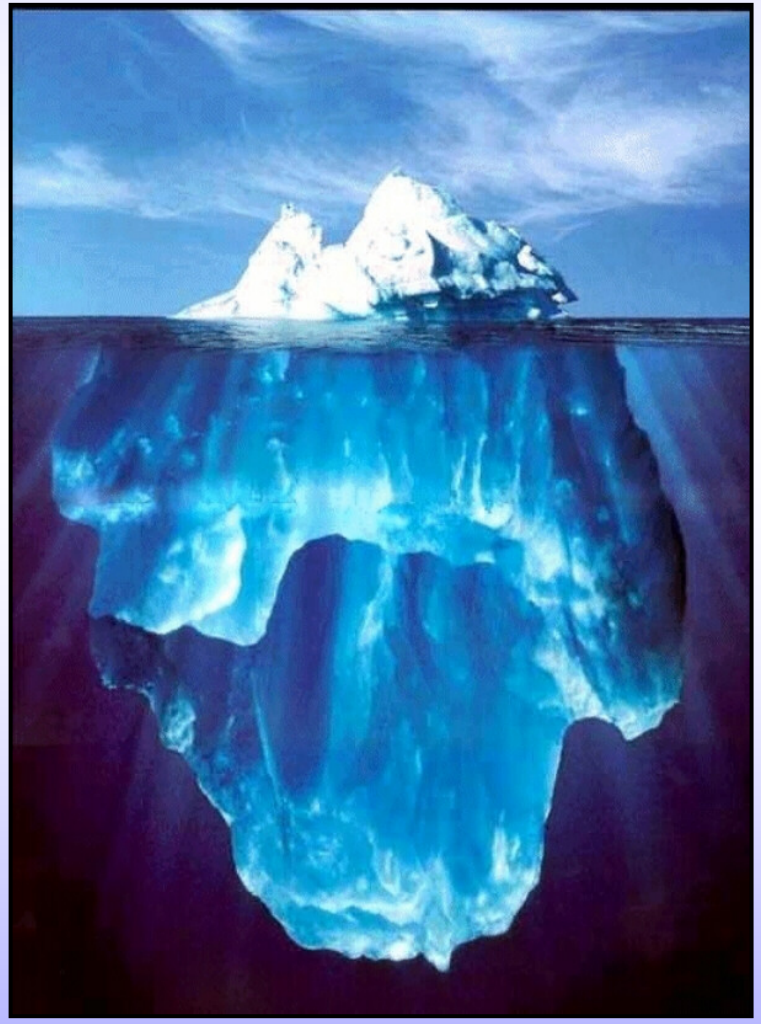
Rollover Example: Case 800003927



Typical Rollover Injury Crash in a Curve Costs: ~$281,000

- Labor: ~$70,000
  - Driver Replacement: ~$7,000
  - Worker's Compensation: ~$63, 000
- Operational: ~$28,000
- Environmental: ~$82,000
- Injury: ~$20,000
- Property damage: ~$56,000
- Legal: ~$25,000

Quantifiable Crash Costs are the "Tip of the Iceberg"



Indirect Costs of Crashes

- Insurance increases
- Federal safety rating impacts
- Loss of customer goodwill and/or business effects
- Public image impacts
- Employee morale effects

Ranked in the top 12 significant costs out of 21 different costs from a survey of 56 motor carriers expressing that these crash cost items have the greatest near- and long-term effects on revenues and operating costs

Partnerships Are The Key ...

Questions?

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