

NHTSA Heavy Vehicle Safety Research Past, Present, Future

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**National Highway Traffic Safety Administration
Washington, D.C.**

Major regulations over last 15 years

- **Antilock Brakes**

- Final rule published in 1995 requiring ABS on all vehicles over 10,000 lbs GVWR
- Effective Dates of : 1997 for truck tractors; 1998 for all other air braked vehicles; 1999 for hydraulic braked vehicles.

- **Stopping Distance**

- Final rule published July 2009 mandating required stopping distance be reduced by 30% to 250 feet
- Effective Dates: Aug 2011 for typical 6x4 tractors; Aug 2013 for other non-typical tractors

- **Stability Control**

- NPRM published in May 2012 proposing to require ESC on truck tractors and motorcoaches with GVWR greater than 26,000 lbs
- Agency expects to issue final rule in late-2014

- **Several regulations related to motorcoaches**



NHTSA Heavy Truck Research Areas

Heavy Truck Vehicle Design

- Trailer Underride Guards
- Truck Cab crashworthiness
- Heavy Truck Tires

Crash Avoidance Technologies

- Electronic Stability Control (ESC)
- Forward Collision Warning (FCW) and Collision Mitigation Braking (CMB)
- Lane Departure Warning (LDW) Systems
- U.S. DOT Connected Vehicles Program



Heavy Truck Research-Vehicle Design



**Truck
Underride**



**Cab
Crashworthiness**



Truck Underride

- Rear Impact Guards
 - FMVSS No. 223,224 enacted in 1998
 - NHTSA reviewing regulation performance.
 - From 2008-2009 TIFA database, 636 fatalities in light vehicles
 - 42% of trailer impacts have underride to windshield or more
 - 32% of crashes are estimated from 35 mph or less
- Completed UMTRI research papers:
 - *Analysis of Rear Underride in Fatal Truck Crashes*
 - *Heavy Vehicle Crash Data Collection and Analysis to Characterize Rear and Side Underride and Front Override*
- Reports are available from the web:
[://www.nhtsa.gov/Research/Crashworthiness/TruckUnderride](http://www.nhtsa.gov/Research/Crashworthiness/TruckUnderride)
- NHTSA is in process of reviewing data and considering costs/benefits of potential modifications



Truck Cab Crashworthiness

Heavy Truck
Occupant Fatalities →

TIFA					NHTSA	
2006	2007	2008	2009	2010	2011	2012
694	664	561	393	431	507	665

- MAP-21 Section 32203.

“comprehensive analysis on the need for crash worthiness standards on property-carrying commercial motor vehicles with a gross vehicle weight rating or gross vehicle weight of at least 26,001 pounds involved in interstate commerce, including an evaluation of the need for roof strength, pillar strength, air bags, and frontal and back wall standards”

- NHTSA has held meetings with: ATA, OOIDA, Truck/Engine Manufacturers Association, Navistar, Daimler Trucks North America, PACCAR, Indiana Mills and Manufacturing Inc., TRW
- Current research:
 - Reviewing UMTRI report
 - NHTSA internal Data Study
- Report to Congress with supporting documentation by May 2014



NPRM on Heavy Truck Tires

➤ Proposal to modify FMVSS 119

- Upgrade Endurance test
- Add High Speed test
- New labeling requirements for the speed rating of the tire

➤ NPRM published in 2010

➤ Summary of comments:

- High Speed Test: Break-in reqt's should be deleted
- "Max Speed" labeling should not be required; (use speed rating symbols)
- Endurance Test: 62-68 mph tires should be excluded from upgraded endurance test.

➤ Completed additional endurance testing in 2013

➤ Next Steps: Publish Final Rule

Current Endurance Test

Tire Load Range	Drum Speed (mph)	Inflation Pressure (% maximum)*	Test Load (% maximum)*		
			Test Duration (hours)		
			7	16	24
F	40	100	66	84	101
G	35				
H, J, L, M, and N	30				

Proposed Endurance Test

Tire Load Range	Drum Speed (mph)	Inflation Pressure (% maximum)*	Test Load (% maximum)*		
			Test Duration (hours)		
			7	16	24
F, G, H, J, and L	50	80	85	90	100
M and N	30	100	66	84	101



Crash Avoidance Technologies

- Forward Collision Avoidance & Mitigation (F-CAM) and Lane Departure Warning (LDW)
 - Addresses approximately 25% of the total heavy vehicle involved crashes¹
 - Approximately 37,000 rear-end crashes (F-CAM)
 - Approximately 33,000 lane change related crashes (LDW)
- Enhanced safety through:
 - Driver warnings and active vehicle control
 - Driving performance monitoring, training, and remediation efforts
- Early technical challenges are being addressed by suppliers
 - Newer/better sensor technology and sensor fusion
 - More refined detection algorithms (e.g., better stopped object recognition; reduced nuisance alarms)

Forward Collision Avoidance & Mitigation System Research (FCAM)

- Performance Testing and Development of Objective Test Procedures
- Crash Warning Interface Guidelines
- Field Data Collection Study with VTTI
- Cost/Benefit Analysis
- NHTSA Agency Decision on these systems for heavy trucks in 2014



Other Rulemaking Areas

➤ Event Data Recorders (EDR)

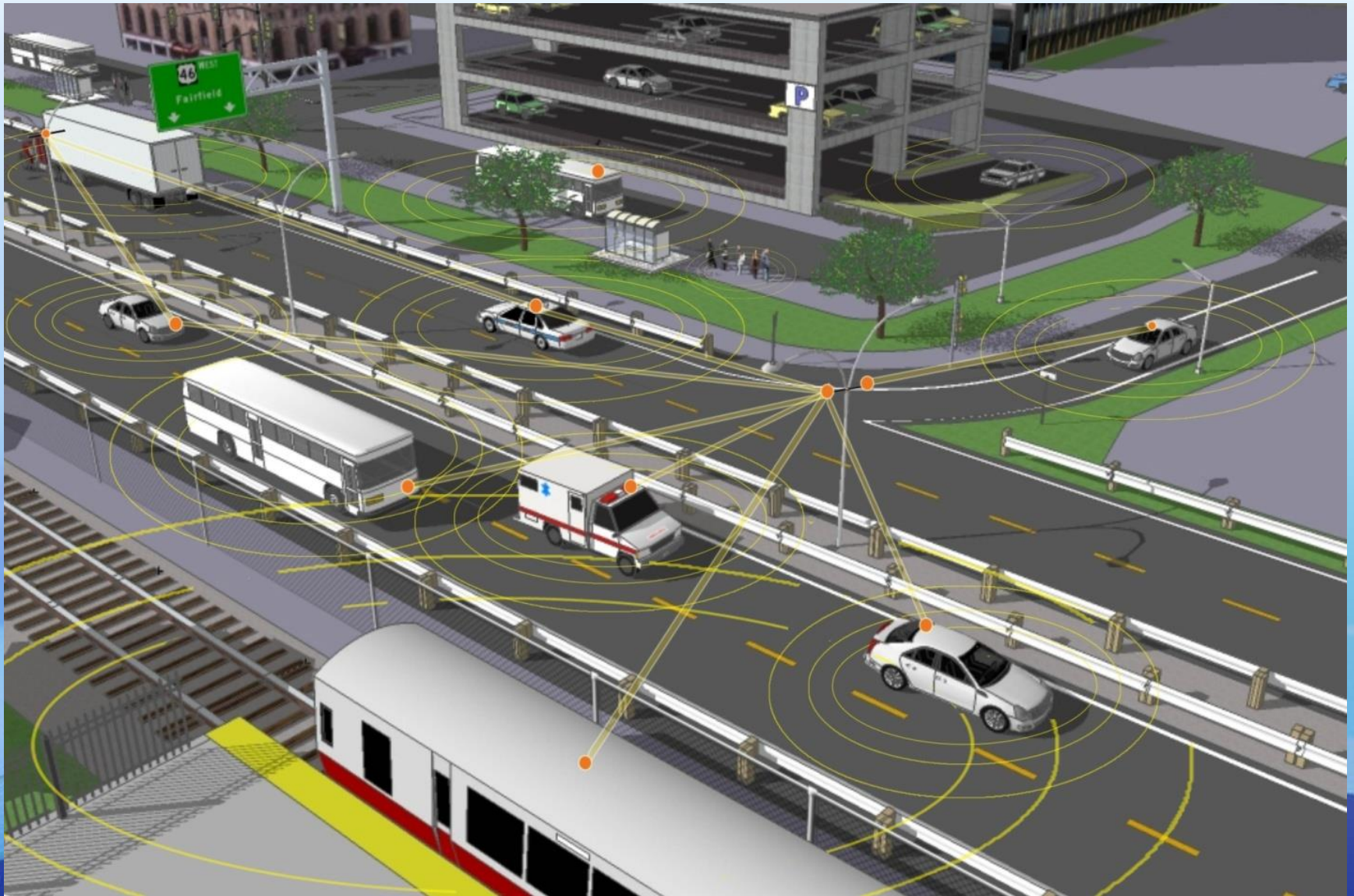
- Respond to NTSB recommendations
- Develop performance requirements; test procedures; cost/benefits
- Next Steps: Agency decision in 2014 on whether to initiate rulemaking.
- <http://www.nhtsa.gov/EDR> (for more information)

➤ Speed Limiters

- Granted petition (filed by ATA and Road Safe America) to review merits (Jan 3rd, 2011).
- Request for comment in 2006 (Docket # 2007-26851)
- Next Steps: Finalize analyses of costs, benefits, and implementation issues. Focus on class 7 and 8 trucks and motorcoaches.
- Next Steps: NPRM expected in 2014



U.S. DOT Connected Vehicle Program



Creating a Multimodal and Connected Environment

Trucks



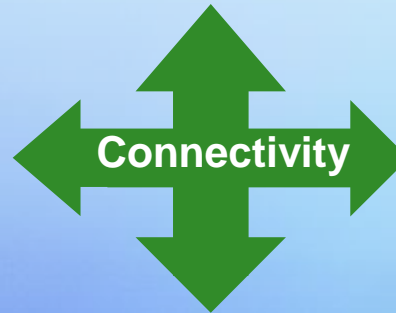
Drivers/Operators



Borders, Ports,
other Intermodal
Facilities



Buses



Intersection
Control

Autos



Personal Wireless
Devices

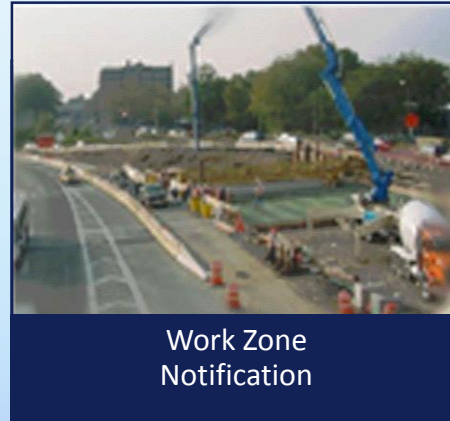


Traffic
Management
and Traveler
Information
Centers

Vehicle Safety Communications

➤ Greater situational awareness

- Your vehicle can “see” nearby vehicles and knows roadway conditions you can’t see



➤ Reduce or mitigate crashes

- Driver Advisories
- Driver Warnings



Contact Information

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