



# National Transportation Safety Board

## *NTSB Most Wanted List of Highway Improvements: 2019*

Robert J. Molloy, PhD  
Director, Highway Safety



NTSB is an independent federal agency, charged by Congress to investigate transportation accidents, determine probable cause, and issue safety recommendations.



**NTSB**

# NTSB CMV Investigations



Elmhurst, IL 3/1/2018



Thoreau, NM 8/30/2018



Bryce Canyon, UT 9/20/2019



Alachua, FL 1/3/2019

# Current CMV Investigations



# Purpose of NTSB

# Safety



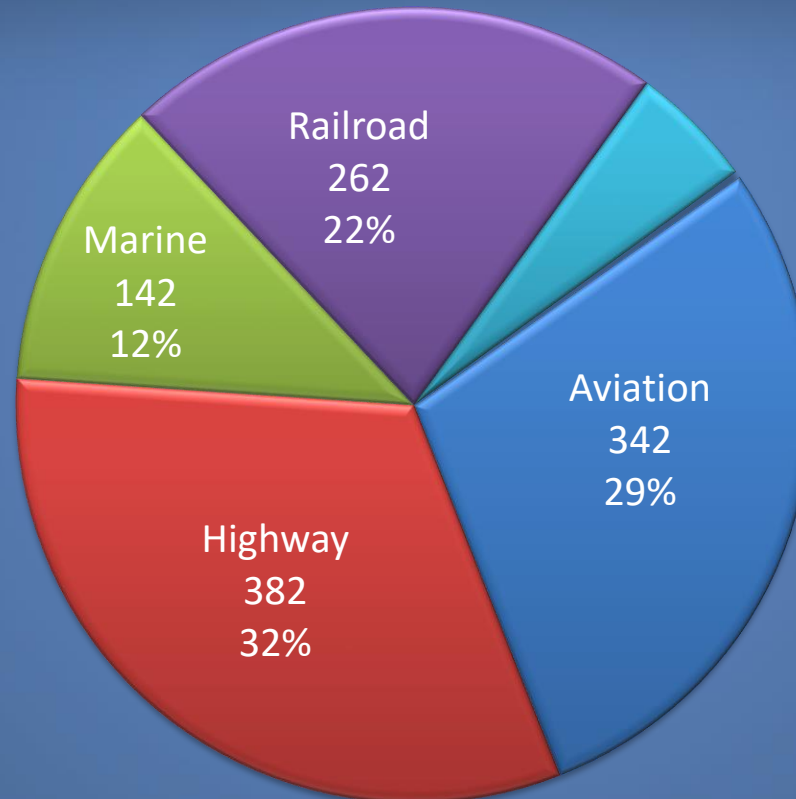
NTSB

# Safety Recommendation Issue Areas

Human	Vehicle	Environment
Fatigue	Collision Avoidance	Median Barriers
Impairment	Crashworthiness	Guard rails
CDL	Maintenance	Lighting
Cell Phone	Oversight	Striping
Medical	Data Recorders	Signage



# Open Recommendations by Mode



# Most Wanted List



**Eliminate Distractions**

NTSB



**Reduce Fatigue-Related Accidents**

NTSB



**End Alcohol and Other Drug Impairment**

NTSB



**Increase Implementation of Collision Avoidance Systems in All New Highway Vehicles**

NTSB



**Implement a Comprehensive Strategy to Reduce Speeding-Related Crashes**

NTSB



**Require Medical Fitness — Screen for and Treat Obstructive Sleep Apnea**

NTSB



**Strengthen Occupant Protection**

NTSB



# MWL: Distractions

- **States**

- Ban all PED use.

- **Operators/Industry**

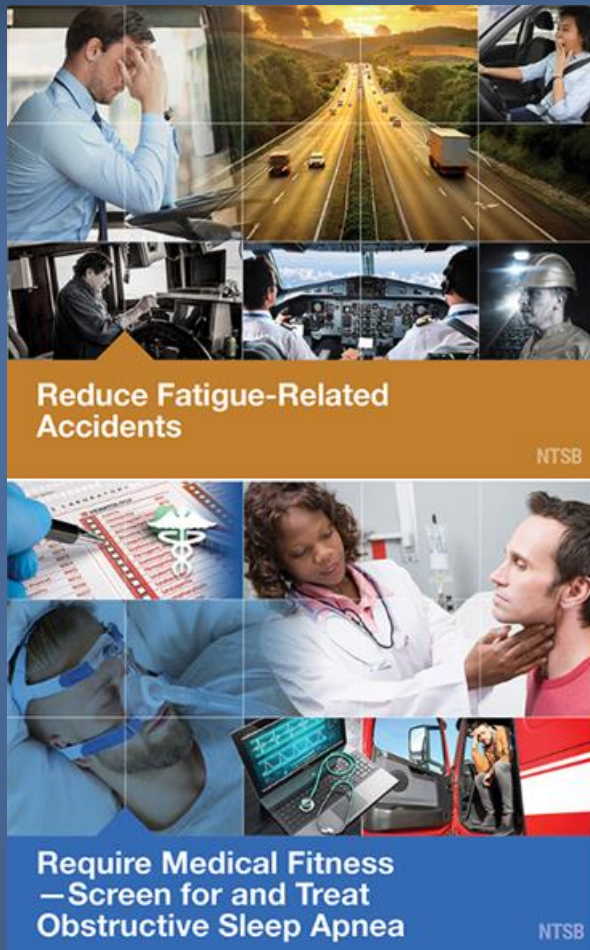
- Teach drivers, operators, and safety-critical personnel about the dangers of distractions.
- Develop PED policies



# Mount Vernon, WA (2013)

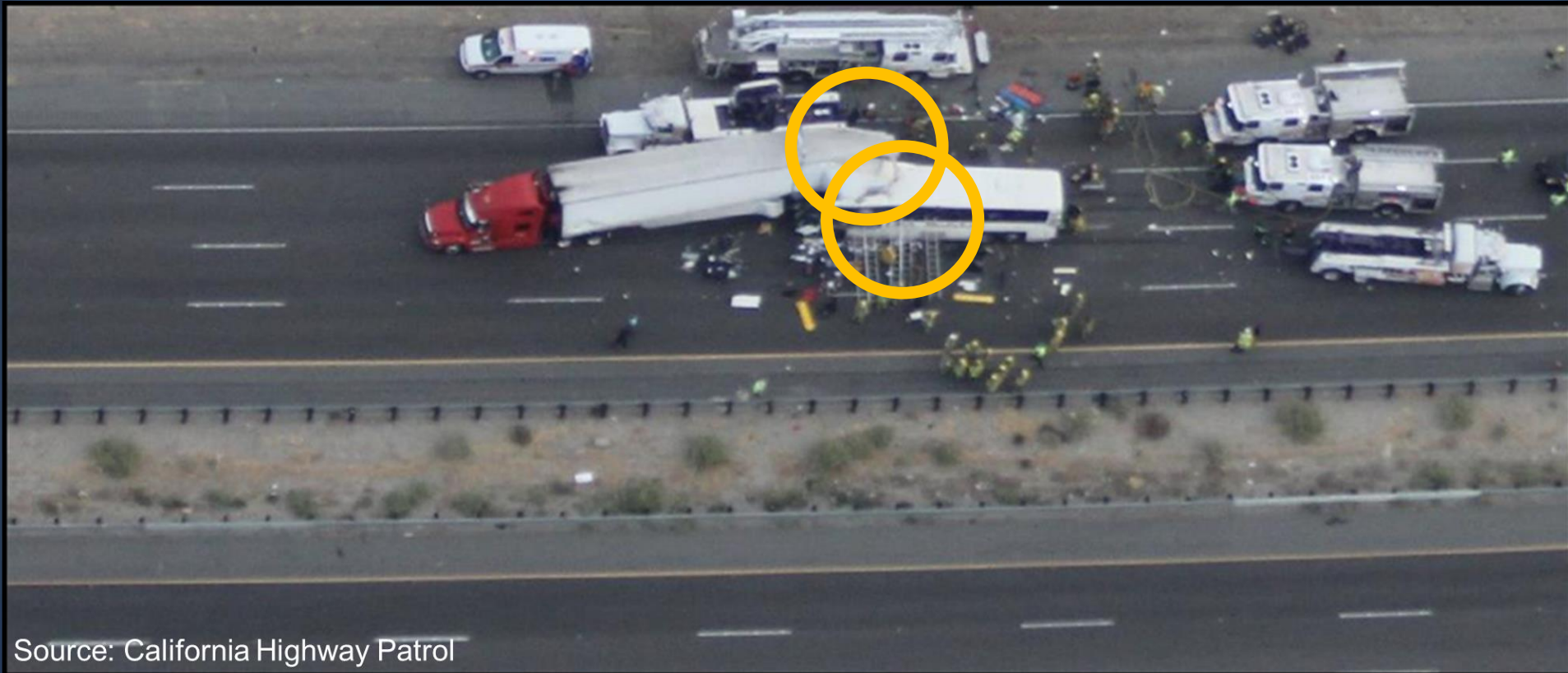


# MWL: Fatigue & Sleep Apnea



- **Operators/Industry**
  - Establish fatigue risk management programs
- **Regulators**
  - Hours-of-service regulations for passenger-carrying drivers who operate during the nighttime window of circadian low.
  - Require motor carriers to adopt fatigue management programs based on the North American Fatigue Management Program.
  - Develop and implement a plan to deploy in-vehicle technologies that reduce fatigue-related crashes.
  - Implement a program to identify commercial drivers at high risk for obstructive sleep apnea (OSA)

# Palm Springs, CA (2016)



# MWL: End Impairment

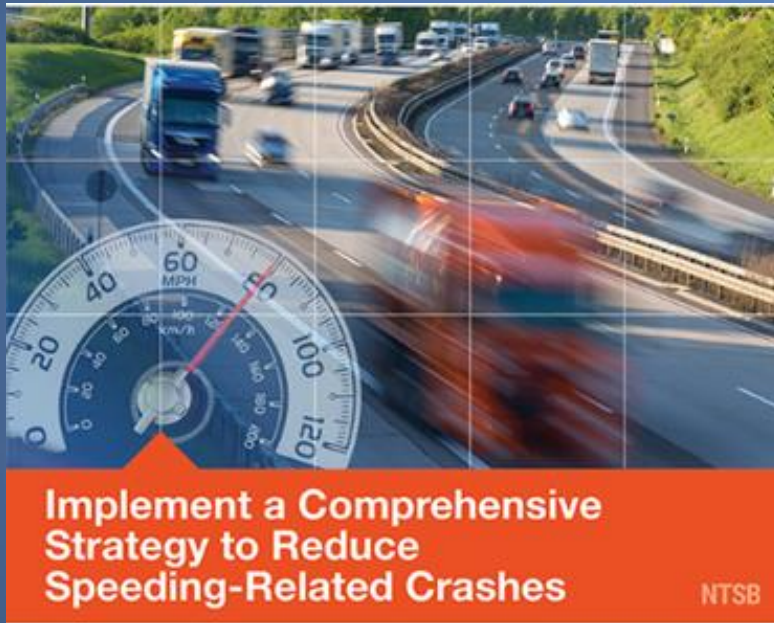


- **States**
  - Establish a per se BAC limit of 0.05 percent or lower
- **Regulators**
  - Develop and disseminate a standard of practice for drug toxicology testing
  - Determine the prevalence of commercial motor vehicle driver use of impairing substances.
  - Work with motor carrier industry stakeholders to develop a plan to help motor carriers address driver use of impairing substances.
  - Disseminate information to motor carriers about using hair testing

# Davis, OK (2014)



# MWL: Speeding



- **Regulators**

- Update and promote best practices for automated speed enforcement
- Improve consistency in law enforcement reporting of speeding-related crashes
- Establish a national education and enforcement campaign
- Develop performance standards for advanced speed-limiting technology
- Encourage passenger-vehicle manufacturers to adopt intelligent speed adaptation systems

- **States**

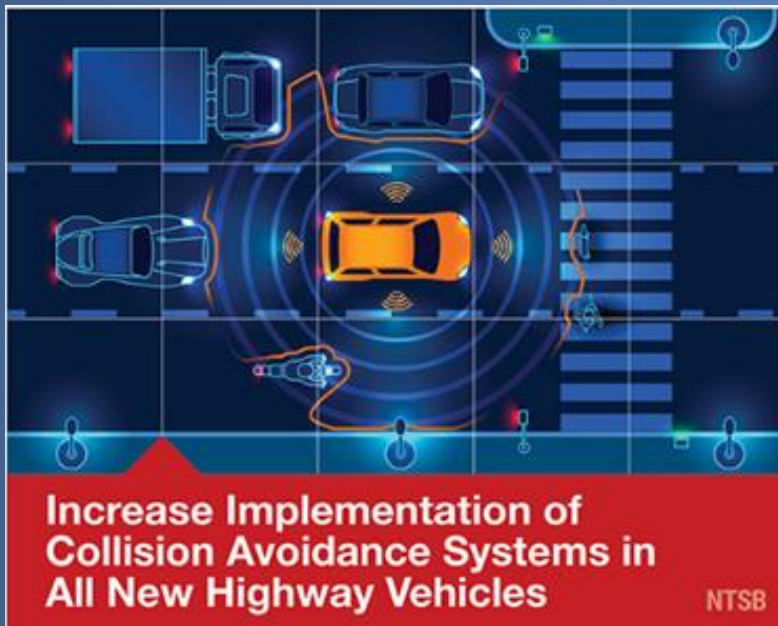
- Implement a comprehensive strategy to reduce speeding-related crashes, including authorizing the use of automated speed enforcement
- Revise guidance on setting speed limits to lessen the reliance on 85th-percentile operating speeds

# Stroud, AL (2016)





# MWL: Collision Avoidance



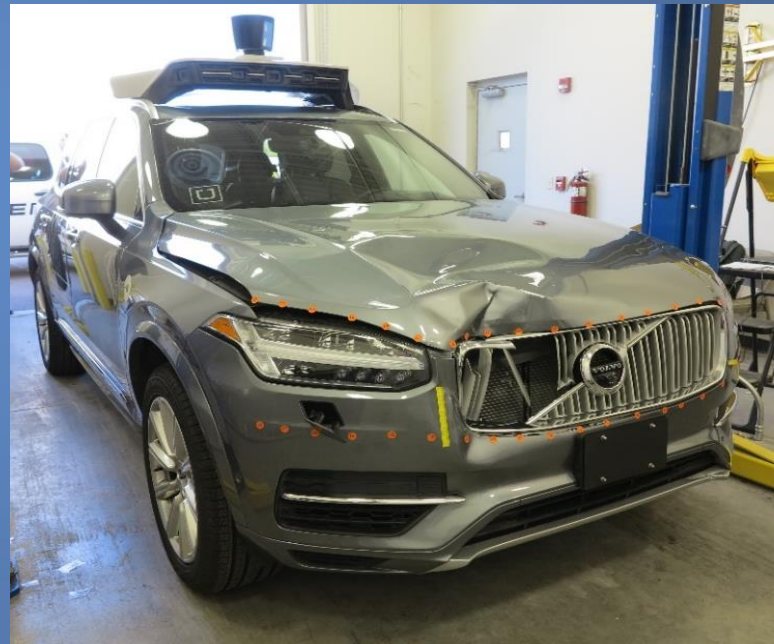
- **Regulators (NHTSA)**
  - Complete standards for collision warning and AEB systems in commercial vehicles and require this technology in all highway vehicles.
- **Vehicle Manufacturers**
  - Install and make standard in all vehicles forward collision avoidance systems that, at a minimum, include a collision warning component. They should not just be options sold as part of expensive add-on packages.

# Goodland, KA, (June 29, 2016)



# Tempe, AZ (3/18/2018)

- 9:58 p.m.
- Pedestrian struck on Northbound Mill Ave
- Uber test vehicle based on Volvo XC90
- Self-driving system in computer control mode



# Crash Location



# Perception and Motion During the Crash



Time to crash: 5.6 seconds  
 Classification: Vehicle  
 Predicted path: None

- Vehicle operator initiated steering 20 msec before impact

Time to crash: 3.9 seconds  
 Classification: Vehicle  
 Predicted path: Left lane

Time to crash: 1.2 seconds  
 Classification: Bicycle  
 Predicted path: Fully on path of the vehicle

Time to crash: 1.2 seconds  
 Classification: Bicycle  
 Predicted path: Fully on path of the vehicle  
 Braking suppression begins

Time to crash: 2.6 seconds  
 Classification: Bicycle  
 Predicted path: Static

Time to crash: 1.5 seconds  
 Classification: Other  
 Predicted path: Static, partially on vehicle's path

Time to crash: 0.2 seconds  
 Classification: Bicycle  
 Predicted path: Fully on path of the vehicle  
 Braking suppression ends

# MWL: Occupant Protection



- **Industry/Operators**

- New buses of all sizes need to be built with lap/shoulder belts for all passengers.
- For larger passenger vehicles, pretrip briefings and training on the proper use of available restraints and evacuation routes are vital.

- **States**

- Enact laws that allow for the primary enforcement of seat belt laws that apply to all vehicle occupants in all seating positions.
- Enact laws that require school buses to be equipped with lap/shoulder belts at all passenger seating positions.
- Use and support high-visibility enforcement campaigns to effectively increase seat belt use.

# Concan, TX (2017)



# Miami Bridge Collapse (2018)



Source: FIU video camera



# Miami Probable Cause

Contributing to the severity of the collapse outcome was the failure of MCM; FIGG; Bolton, Perez and Associates Consulting Engineers; FIU; and the Florida Department of Transportation to cease bridge work when the structure cracking reached unacceptable levels and to take appropriate action to close SW 8th Street as necessary to protect public safety.

# Bridge Designer Pre-Collapse (1)

## Safety

- Tuesday morning, after about an hour of review and evaluation, FIGG had conducted sufficient supplemental/independent computations to conclude that there is not any concern with safety of the span suspended over the road.
- MCM was so notified by [name redacted]
- The methods and results of this independent evaluation will be discussed in some detail further below.

Source: FIGG Bridge  
Engineers

# Bridge Designer Pre-Collapse (2)

## Conclusions and Recommendations

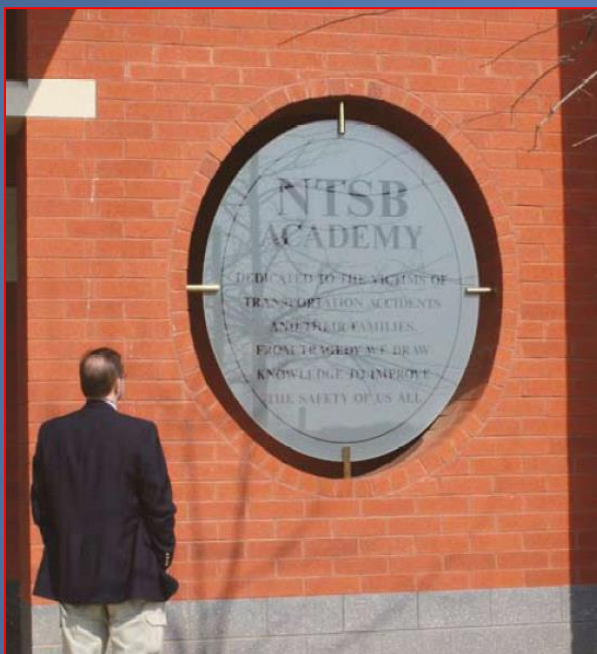
- The diagonal type cracks, in excess of FDOT criteria, should be sealed with approved methods and materials (Epoxy injection, etc.)
- The spalled areas have not been replicated by the engineering analyses. However ...
- The spalled areas are minor and it is recommended that they be prepared using normal procedures and poured back along with the up coming “pylon diaphragm” pour (different from and prior to the back span on falsework pours)

Source: FIGG Bridge  
Engineers

# Responsibilities Among Parties

- FIU, FDOT, FIGG, MCM, and Bolton Perez were aware of the cracks and their progression
- Remedial work as FIGG presented
  - Placing workers on structure without identifying failure origins
- Bolton Perez could have authorized work to be suspended, acting collectively with FDOT and FIU
- FIU, FDOT, FIGG, MCM, and Bolton Perez had implied authority to stop bridge work
  - Did not act on that authority

# Thank You!



“From tragedy we draw knowledge to improve the safety of us all.”

[molloyr@ntsb.gov](mailto:molloyr@ntsb.gov)



**NTSB**