SINGAPORE 2019

26th ITS World Congress
21–25 October

Smart Mobility, Empowering Cities

U.S. Department of Transportation
Federal Highway Administration

www.itsworldcongress2019.com | #ITSWC19

Organised by

Land Transport Authority
We Keep Your World Moving

ITS Singapore

Co-hosted by

ASIA-PACIFIC ITS

ITS AMERICA

ERTICO
ITS EUROPE

SINGAPORE 2019

26th ITS World Congress
21–25 October

Truck Automation Research in the U.S.: A Multimodal, Multidisciplinary Approach

Carl K. Andersen

Federal Highway Administration (FHWA)

U.S. Department of Transportation
Federal Highway Administration

Research Focus Areas:

National Highway Traffic Safety Administration (NHTSA)

- Hazard Analysis of Heavy Truck Platooning Concepts.

Federal Motor Carrier Safety Administration (FMCSA)

- Automated Commercial Motor Vehicle Evaluation (ACE).
- Commercial Motor Vehicle Brake Performance Stopping Distance Variability.

Federal Highway Administration

- Truck Platooning.
- CARMA[SM]

Hazard Analysis of Heavy Truck Platooning: NHTSA Research Objectives

- Develop an understanding of heavy truck platooning concepts.
- Explore how safety hazards can be assessed and how they vary based on different levels of implementation.
- Identify variety within truck platooning systems (current and future concepts).
- Perform hazard analyses on *typical* heavy truck platooning system concepts and identify cross cutting and unique items.

Source: NHTSA

Automated Commercial Motor Vehicle (CMV) Evaluation Program: FMCSA Focus Areas

- Roadside Inspections of Automated Driving System (ADS)-equipped CMVs.
- Automated CMV Technologies and Capabilities (e.g., Platooning, Advanced Driver Assistance).
- Inservice training with FMCSA field staff.
- CMV Driver Readiness for Advanced Technologies.
- CMV Cybersecurity.

Source: USDOT and FHWA.

FMCSA Five-Year Research, Testing, and Evaluation Timeline

2019

- Collaborate with the AV Industry through open-source AV software (CARMA).
- Develop FMCSA's Automated Truck Safety Research Plan.
- Design and install hardware to equip three tractor trailers with Level 2/3 automation capability.

2020

- Perform verification testing and delivery of automated tractor trailers.
- Conduct demonstration events with State law enforcement partners.
- Develop individual test plans and test cases for future year testing.

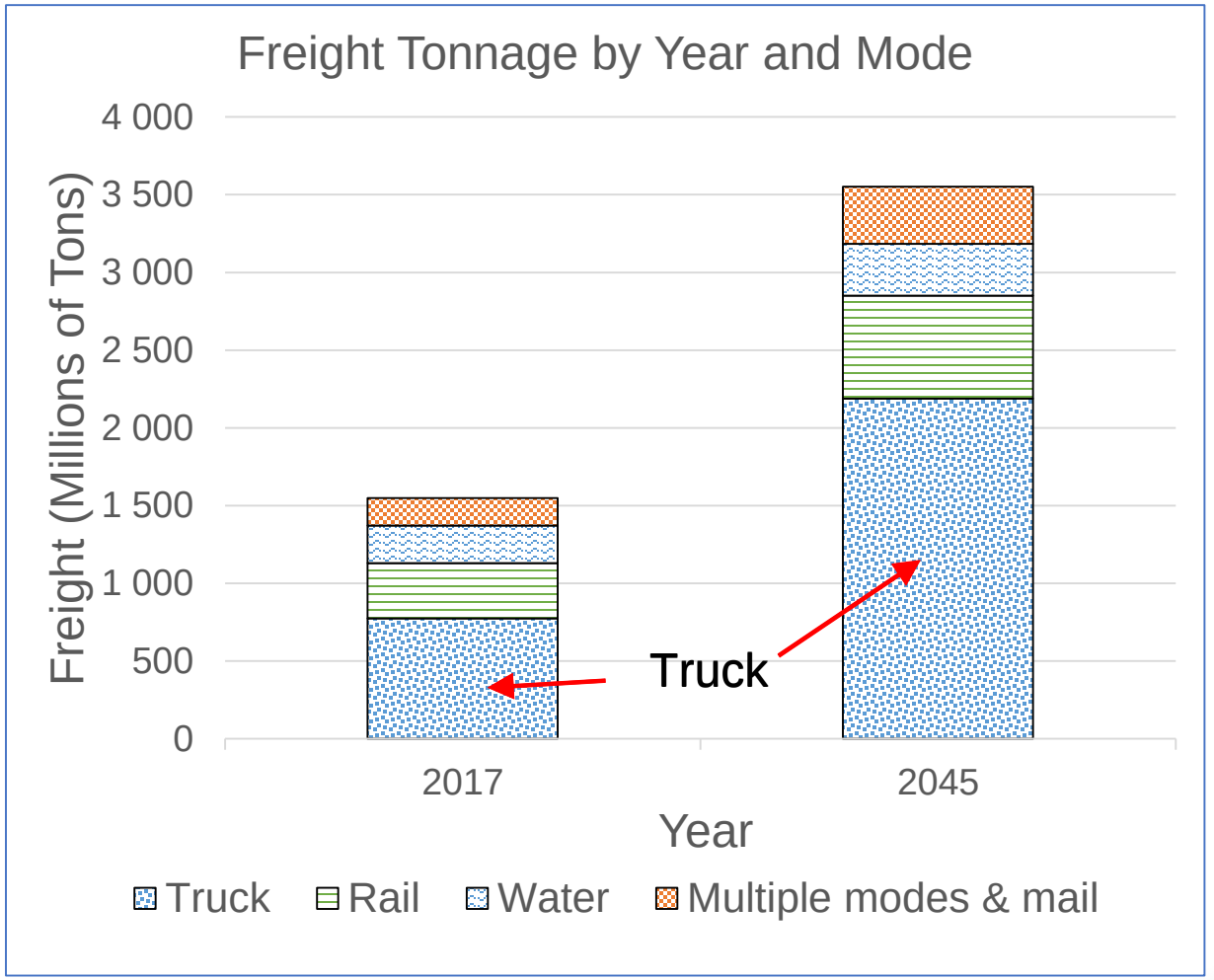
2021-2023

- Conduct test events to research inspection protocols, work-zone area safety, and emergency response situations.
- Utilize FMCSA's automated tractor trailers for inservice training with FMCSA field staff at academies and training centers.
- Perform joint testing with the Maritime Administration (MARAD) using automated trucks in a port drayage setting.

FHWA Truck Platooning Research

Potential Benefits:

- Reduced emissions and energy use from aerodynamic drag reduction.
- Improved safety from faster reaction times and supporting systems.
- Reduced highway congestion (shorter following distance).
- Reduced driver workload.



Source: FHWA

FHWA Truck Platooning Research

Current Research Efforts:

- Human Factors Issues Related to Truck Platooning.
- Truck Platooning Early Deployment Assessment.
- Truck Platooning Impacts on Bridges.

Source: FHWA

USDOT Multimodal Partnership

Source: FHWA and Port Houston.

Federal Highway Administration
Office of Operations
Office of Operations Research and Development (R&D)
Office of Safety R&D

Federal Motor Carrier Safety Administration
Technology Division
Research Division

Maritime Administration
Office of Ports and Waterways Planning

Intelligent Transportation Systems Joint Program Office
Vehicle Safety and Automation
Data Program

Volpe National Transportation Systems Center
Advanced Vehicle Technology Division

Automated Cars

FHWA

1 Basic Travel

2 Traffic Incident Management

3 Work Zones

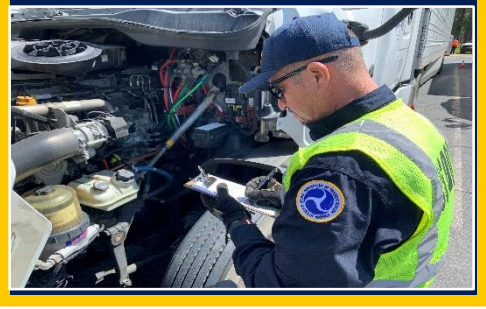
4 Weather

Automated Trucks

FMCSA

1 Truck Platooning

2 Roadside Inspection/Enforcement



3 Work Zones

Automated Trucks

MARAD

Maritime Administration

1 Port Drayage

Sources: FHWA, FMCSA, and MARAD.

Disclaimer

The U.S. Government does not endorse products or manufacturers. Trademarks or manufacturers' names appear in this presentation only because they are considered essential to the objective of the presentation. They are included for informational purposes only and are not intended to reflect a preference, approval, or endorsement of any one product or entity.

Smart Mobility, Empowering Cities

U.S. Department of Transportation
Federal Highway Administration