



U.S. Department of Transportation  
Federal Motor Carrier Safety Administration

# Facilitating Safe Automated Trucking on Our Nation's Roadways

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Office of Research and Information Technology



# Mission

Reduce crashes, injuries, and fatalities involving commercial motor vehicle (CMV) transportation through education, innovation, regulation, enforcement, financial assistance, partnerships, and full accountability.



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# FMCSA's Role in Automated Commercial Motor Vehicles

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- **Conduct research** to inform safety equivalency decisions for waivers, exemptions, and pilot programs
- **Identify best practices** for industry's use of automated CMVs
- **Remove regulatory barriers** to the operation of automated CMVs
- **Promote safe operation** of automated CMVs

# Automated CMV Evaluation (ACE) Program Focus Areas

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





# ACE Program Resources

- Four tractor-trailers equipped with hardware to enable Level 2/3 automation
- Autoware & CARMA software to enable automation
- To be used as research vehicles in FMCSA's automated CMV evaluation program



# USDOT Cooperative Automation Solution

## CARMA 3 APPROACH



Advancing Cooperative ADS research with FHWA and FMCSA fleet and partnerships

CARMA  
PLATFORM



Source: FHWA.

- Expand cooperative automation capabilities.
- Develop proofs of concept to support TSMO use cases.
- Collaborate with Infrastructure Owner-Operator (IOO)/Original Equipment Manufacturer (OEM) community.



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- Leverage Autoware open-source software (OSS) development.
- Enable ADS level 2-3 capabilities.
- Engage ADS community.

Autoware  
PLATFORM



# FMCSA Platooning Research

FMCSA views platooning as one application of cooperative automation capability.

Specific areas of interest include:

- Brake variability and performance;
- Trailer load considerations;
- Platoon size considerations;
- Platoon interactions with law enforcement;
- Platoon dissolution; and
- Identification of potential regulatory barriers to platooning.

# ACE Program Schedule

FY19

- Develop automation capability for four tractor-trailers
- Develop an *Automated Truck Safety Research Plan* to guide research test and evaluation program

FY20

- Conduct demonstrations of vehicle capabilities
- Begin research test program
- Continue software development for future test events

FY21-23

- Conduct test events and analyze outcomes for publication
- Joint proof of concept testing with MARAD on port drayage scenarios
- Utilize vehicles for outreach with State partners





# CVSA -- Automated Vehicle Working Group

**Option 2** – require SAE Level 1-3 vehicles to include a malfunction light/indicator or some other means (electronic) to indicate that the ADS as a whole is functioning correctly.

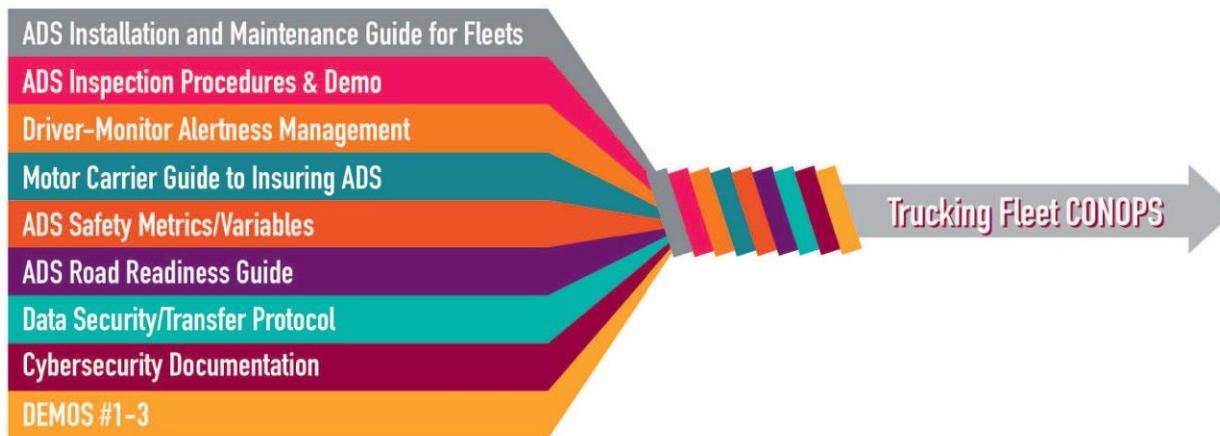
- The ABS malfunction lamp is a guide for this approach.

**Option 7** – require SAE Level 4-5 vehicles to be able to confirm electronically that their ADS is functioning properly while en-route. Roadside inspections of these vehicles will be limited.

\*Note: Recommendations are those of the CVSA Working Group only

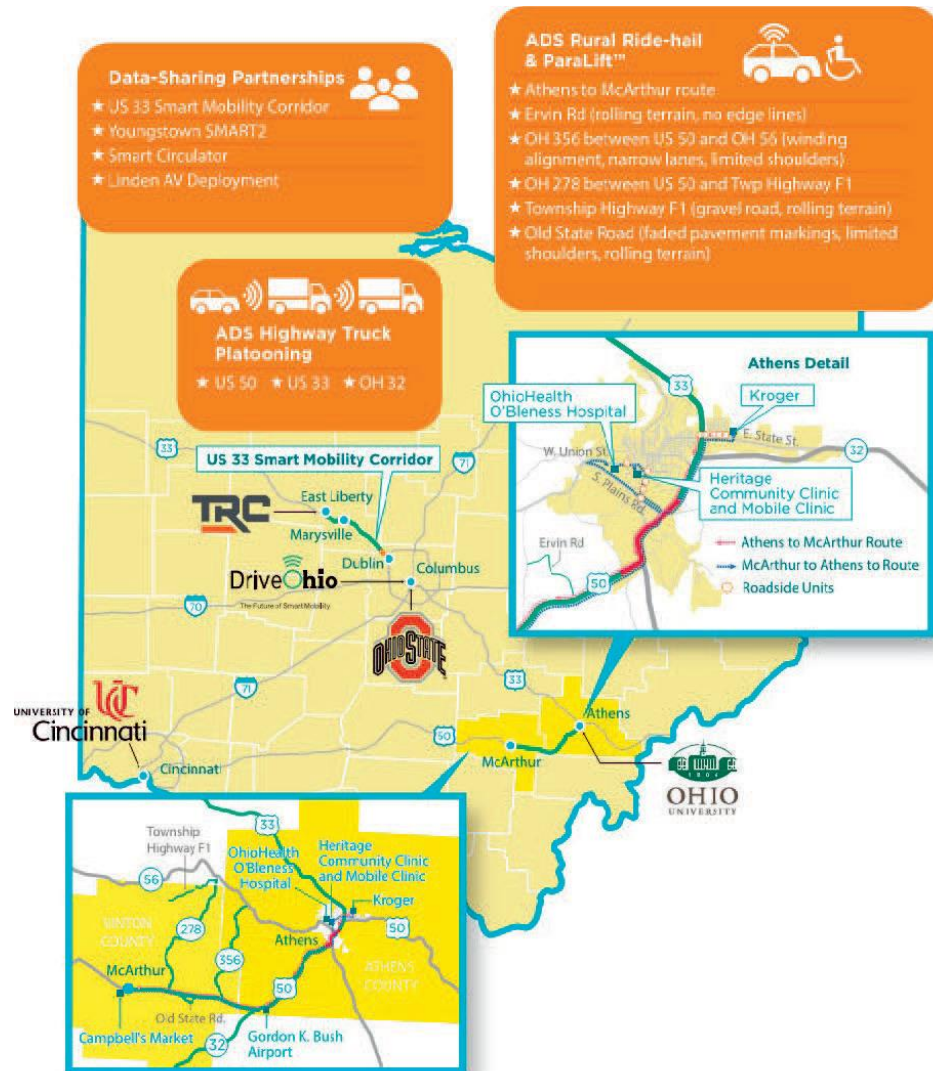
# ADS Demonstration Grants

- Participated in Notice of Funding Opportunity (NOFO) for \$60M in Grants for ADS Demonstrations and will lead two ADS Demonstration Grants (VTTI, Ohio DOT)
- Virginia Polytechnic Institute and State University Transportation Institute (VTTI) “Trucking Fleet CONOPS for Managing Mixed Fleets”
  - ADS Grant Award: \$7,500,000
  - Total Project Cost: \$13,455,912



# ADS Demonstration Grants

- Ohio Department of Transportation (through DriveOhio) “D.A.T.A. in Ohio: Deploying Automated Technology Anywhere”
  - ADS Grant Award: \$7,500,000
  - Total Project Cost: \$17,791,062



# Program Contact Information

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