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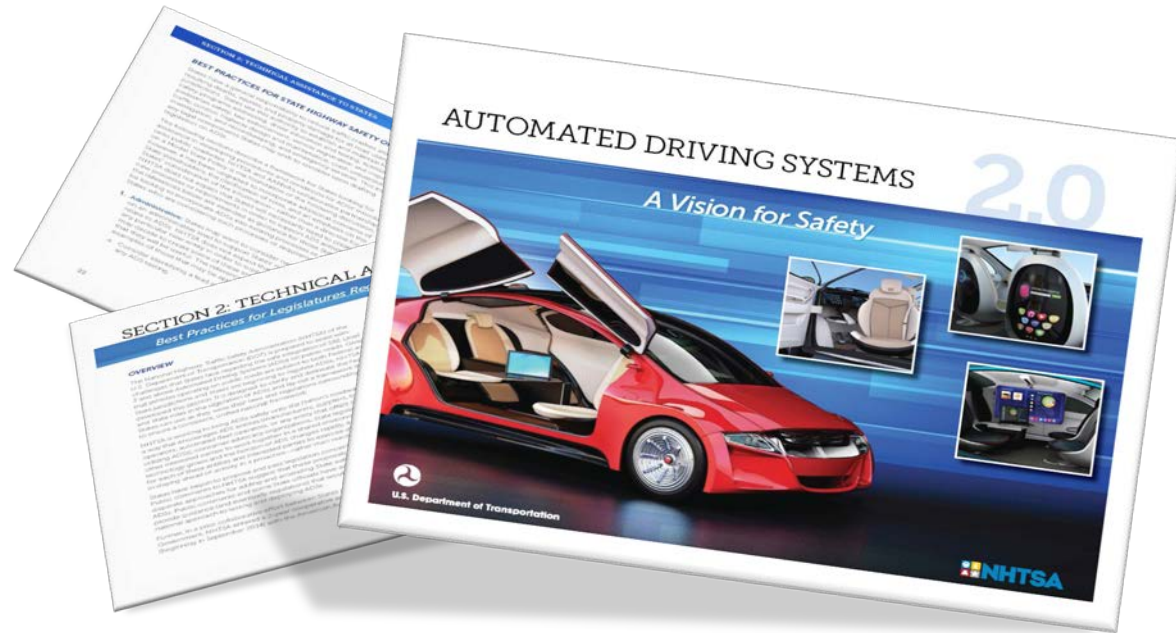
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**Connected and Automated Driving Research in the U.S.
October 29, 2017**

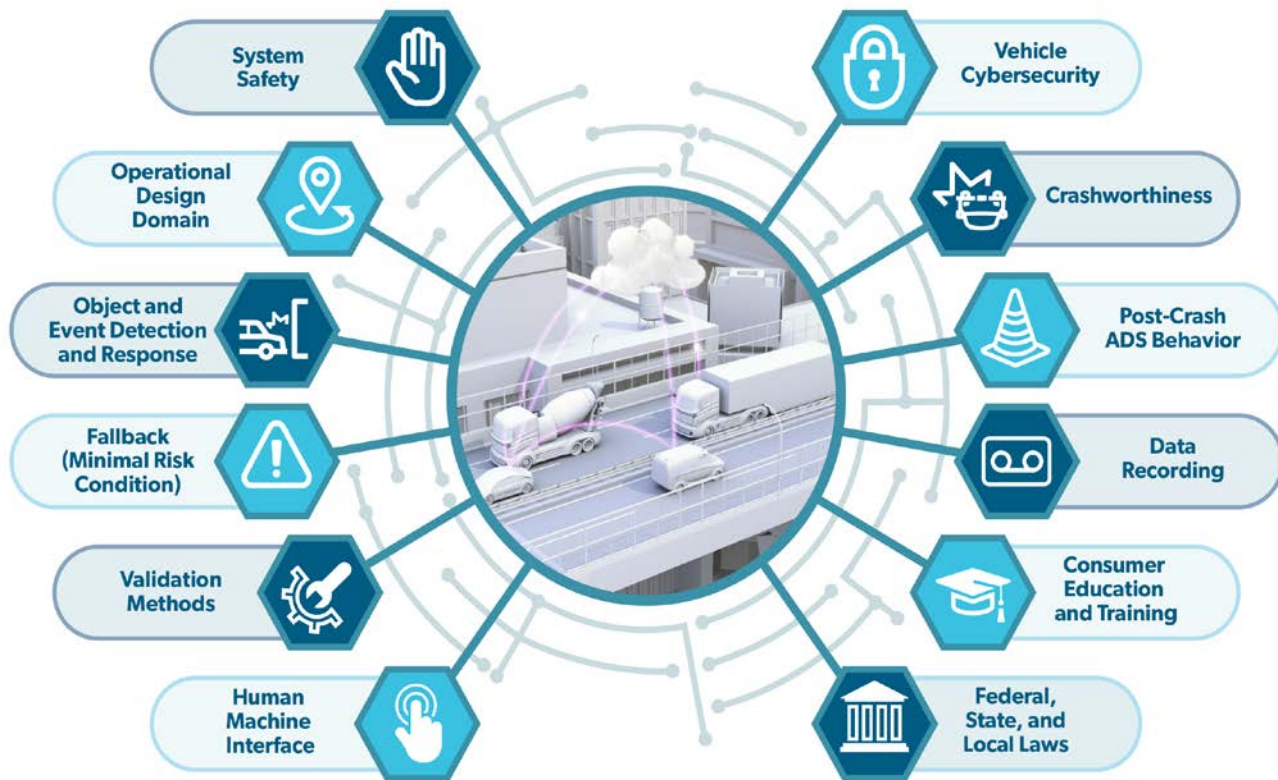
ADS 2.0: A Vision for Safety



The Department's new, non-regulatory approach to promote the safe testing and development of automated vehicles

Source: USDOT NHTSA Automated Driving Systems 2.0: A Vision For Safety

Safety Elements for Automation



Automated Vehicle Technology Efforts Are Coordinated Across Multiple U.S. DOT Agencies

- National Highway Traffic Safety Administration (NHTSA)
- Federal Highway Administration (FHWA)
- Federal Motor Carrier Safety Administration (FMCSA)
- Federal Transit Administration (FTA)
- Maritime Administration (MARAD)
- Intelligent Transportation Systems Joint Program Office (ITS JPO)



NHTSA Driving Automation Research



- Electronic Control Systems Safety
- System Performance
- Human Factors
- Cybersecurity

FHWA Cooperative Automation Research

Developing cooperative driving automation system applications:

Light Vehicle and Truck Platooning

- Cooperative Adaptive Cruise Control (CACC) via Vehicle-to-Vehicle (V2V)

Signalized Intersection Approach and Departure

- GlidePath via Vehicle-to-Infrastructure (V2I)

Automated Traffic Flow Optimization

- Speed Harmonization via Vehicle-to-Infrastructure (V2I)

Proof-of Concepts

- Lane Change, Merging and Weaving Operations

Evaluating impacts of automated driving technology on the transportation planning process



FTA Transit Automation Research Plan

| | |
|--------------------|--|
| Overview: | 5-year plan for FTA research and deployment |
| Lead: | FTA Office of Research, Demonstration, and Innovation |
| Scope: | Bus transit automation, defined broadly |
| Key inputs: | VAA program, MOD Sandbox, stakeholder perspectives, use case analysis, benefit-cost analysis |
| Target: | December 2017 (public webinar) |



FTA Research Underway

Knowledge Transfer

- Inform internal and external stakeholders about state of the practice and research in progress.

Technology Transferability

- Assess transferability of light-duty and commercial vehicle sensors and technologies to transit applications.

Policy Review

- Identify and analyze federal, state, and local policies relevant to transit automation and provide recommendations for needed revisions and/or development of new policies.



FMCSA Automated Commercial Vehicle Activities

- Gathering information on issues relating to design, development, testing, and deployment of highly automated commercial vehicles.
- FMCSA seeks information on how to ensure that Federal safety regulations provide appropriate standards for the safe operation of HACVs from design and development through testing and deployment.
- Collected public comments available at:
<https://www.regulations.gov/document?D=FMCSA-2017-0114-0001>
- FMCSA expects to use existing tools – (national) waivers, temporary exemptions, pilot programs and/or demonstration programs as tech developers prepare to remove driver from seat
- FMCSA looks forward to sharing lessons learned and best practices as pilot projects develop and evolve



MARAD Automation Activities



Low Speed Automated Truck Queue at Ports and Warehouses (joint project with FMSCA and JPO)

- Exploring application of automation to low-speed commercial vehicle operations at port terminals and warehouses
- Review of related studies and papers
- Technology scan of existing or near-term enabling technologies
- Surveys of industry and technology stakeholders
- Cost estimation and safety benefits

ITS JPO Automation Research

Technical Research

- Assessing Applications for Improving System Safety
- Developing Impacts Assessment
- Evaluating New Data Collection & Sharing Models

Program and Policy Support

- Strategic Planning and Roadmap Development
- Modal Policy Support and Coordination

Stakeholder Engagement

- Supporting Professional Capacity Building Efforts
- Facilitating International Coordination
- Low-speed Automated Shuttle Information Sharing Working Group

The screenshot shows the website for the Intelligent Transportation Systems Joint Program Office (ITS JPO) under the United States Department of Transportation. The page is titled "ITS Research 2015-2019 AUTOMATION" and features a navigation menu with options like "About", "Research", "ITS Deployment", "Communications", "Technology Transfer", "Resources", and "Contact Us". A sidebar on the left lists "Research Areas" such as "Accelerating Deployment", "Automation", "Connected Vehicles", "Emerging Capabilities", "Enterprise Data", "Interoperability", "National Transportation Library", and "ITS Research Archive". The main content area includes a header image of a person in a white protective suit, a section titled "ABOUT AUTOMATION" with introductory text, and a "ABOUT THE ITS STRATEGIC PLAN" section with a link to a report. A small image at the bottom shows a self-driving car on a test track.

EC-US Research Twinning

- Research projects of similar scope, objectives and timeline are aligned to run in parallel, in an integrated fashion, for the mutual benefit of both sides
- Sponsoring agencies on either side identify project areas that are suitable for twinning
- Twinning Agreements are developed by project teams and approved by sponsor agencies before projects commence
- Project activities feature regular interaction between project teams including at least one face-to-face meeting per year
- No exchange of project funds

