Integrating Technology Innovations into Our Roadway System

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AV 3.0 – Considerations for Infrastructure Owners and Operators (IOO)

1. Support safe testing and operations of automated vehicles on public roadways.
2. Learn from testing and pilots to support highway system readiness.
3. Build organizational capacity to prepare for automated vehicles in communities.
4. Identify data needs and opportunities to exchange data.
5. Collaborate with stakeholders to review the Uniform Vehicle Code (UVC).
6. Support scenario development and transportation planning for automation.
1. Quality and uniformity of road markings, signage, and other traffic control devices support both human drivers and automated vehicles.

2. The Manual on Uniform Traffic Control Devices (MUTCD) is recognized as the national standard for all traffic control devices installed on any street, highway, bikeway, or private road open to public travel.

3. FHWA will pursue an update to the 2009 MUTCD that will take into consideration these new technologies and other needs.
2018 National Dialogue Workshops

Key objectives

1. Assess national issues and priorities.
2. Develop guidance, best practices, standards.
3. Support necessary research.
4. Adapt programs and policies.
5. Create a national community or coalition.

Source: FHWA
National Dialogue Workshop Insights

Need For:

• National vision
• Coordinated communication
• Education, resources, and guidance
• Integration of automated freight operations
• Public safety and emergency response interactions
• Planning process evolution
• Data exchanges, standardization, and lifecycle management

Source: FHWA

Infrastructure design, structural, and operations standards
FHWA Automation Readiness Strategy

AV 3.0

FHWA Leadership and Working Groups

National Dialogue

Automation Readiness Strategy

FHWA Program Integration Plan

National Automation Readiness Framework and Concept of Operations

Implement

External Coordination

State and Local Action

USDOT AV Initiatives

Other
FHWA Automation Readiness Strategy (Cont.)

FHWA Program Integration Plan

- Translate the Dialogue internally
- Align existing FHWA programs
- Synchronize with Research Roadmap
- Evolve organizational roles
- Develop organizational knowledge
- Document recurrent internal plan
- Sustain internal-facing process

National Automation Readiness Framework and “Concept of Operations”

- Engage stakeholders post-dialogue
- Define facets of “readiness”
- Enable national strategy and vision
- Establish Operational Design Domain (ODD)-based roadway systems interfaces
- Introduce a system and organizational strategic planning tool
- Build national community
Impacts of AV on Highway Infrastructure

**Purpose:** Evaluate the interaction of vehicle automation and road infrastructure.

**Goal:** Develop documentation and inform stakeholders about AV-related infrastructure needs.

**Objectives:** Assess and understand:
- The demands and potential impacts of AVs on our current infrastructure assets, and
- The potential needs and impacts of AVs on the future design of new infrastructure.
## Highway Infrastructure Categories

### Traffic Control Devices
- Barriers
- Channelizing Posts
- Pavement Markings
- Traffic Signs
- Traffic Signals
- Work Zones

### Pavements and Structures
- Asset Management
- Condition and Performance Design
- Innovative Technologies
- Maintenance Materials

### TSMO and ITS Infrastructure
- ITS Roadway Equipment
- Parking Management Systems
- Transportation Management Centers
- Digital Infrastructure

### Multimodal Infrastructure
- Bike and Ped Infrastructure
- American Disabilities Act
- Accessibility
- Multimodal Traffic Control Devices
- Curb Design and Management
- Parking

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TSMO=Transportation Systems Management and Operations  |  ITS=Intelligent Transportation Systems  |  Ped=Pedestrian
ADS Operational Behavior and Traffic Regulation Information Exchange Project Overview

Traffic Regulations from various jurisdictions

Convert to traffic regulation database

Exchange traffic regulation data

Automated Driving System (ADS)
Cooperative Automation Research Mobility Applications

Safely improve the operational efficiency and maximize capacity of our Nation’s urban and rural roadways

- Reduce fuel consumption at intersections by 20 percent.
- Save Fuel by 10 percent.
- Increase capacity of existing lanes.

Source: FHWA
CARMA Platform

An open source platform that enables collaboration with the stakeholder community.

- Vehicle-to-Vehicle
- Laser Imaging, Detection, and Ranging
- Controller Area Network
- Human Machine Interface
- Vehicle-to-Infrastructure
- Global Positioning System
- Cooperative Automation Driving Systems
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Source: FHWA.
V2X Hub

- Open-source software platform.
- CAV deployers can implement custom code.
- Accessible across different organizations and disciplines.
- Enables integration with existing systems.
- Available plugins include emergency vehicle preemption and performance measures.
FHWA Truck Platooning Research

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

Source: FHWA.
For More Information

FHWA  https://ops.fhwa.dot.gov/automationdialogue/

AASHTO  www.transportationops.org/resources-connected-and-autonomous-vehicles

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