NATIONAL DIALOGUE ON
HIGHWAY AUTOMATION

U.S. Department of Transportation
Federal Highway Administration

FHWA National Dialogue on Highway Automation

Automation and Freight
Hyatt Regency, Chicago, IL

September 5-6, 2018

Levels of Automation

SOCIETY OF AUTOMOTIVE ENGINEERS (SAE) AUTOMATION LEVELS

Full Automation

0	1	2	3	4	5
No Automation	**Driver Assistance**	**Partial Automation**	**Conditional Automation**	**High Automation**	**Full Automation**
Zero autonomy; the driver performs all driving tasks.	Vehicle is controlled by the driver, but some driving assist features may be included in the vehicle design.	Vehicle has combined automated functions, like acceleration and steering, but the driver must remain engaged with the driving task and monitor the environment at all times.	Driver is a necessity, but is not required to monitor the environment. The driver must be ready to take control of the vehicle at all times with notice.	The vehicle is capable of performing all driving functions under certain conditions. The driver may have the option to control the vehicle.	The vehicle is capable of performing all driving functions under all conditions. The driver may have the option to control the vehicle.

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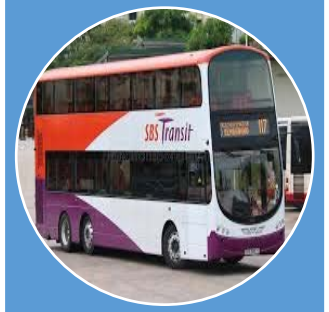
USDOT Modal Agencies and Roles

Federal Highway Administration (FHWA) is responsible for providing stewardship over the construction, maintenance, and preservation of the Nation's highways, bridges, and tunnels.

The **Federal Motor Carrier Safety Administration's (FMCSA)** partners with industry, safety advocates, and State and local governments to keep the Nation's roads safe and improve commercial motor vehicle (CMV) safety through regulation, education, enforcement, research, and technology.



The **Federal Transit Administration (FTA)** provides financial and technical assistance to local public transit systems, including buses, subways, light rail, commuter rail, trolleys, and ferries.

The **National Highway Traffic Safety Administration's (NHTSA)** mission is to save lives, prevent injuries, and reduce the economic costs of road traffic crashes through education, research, safety standards, and enforcement activity.

MARAD's mission is promote the development and maintenance of an adequate, well-balanced United States merchant marine.

PHMSA's mission is to protect people and the environment by advancing the safe transportation of energy and other hazardous materials that are essential to our daily lives

FRA develops and enforces safety regulations and invests in passenger and freight rail services and infrastructure, and research into and development of innovations and technology solutions.

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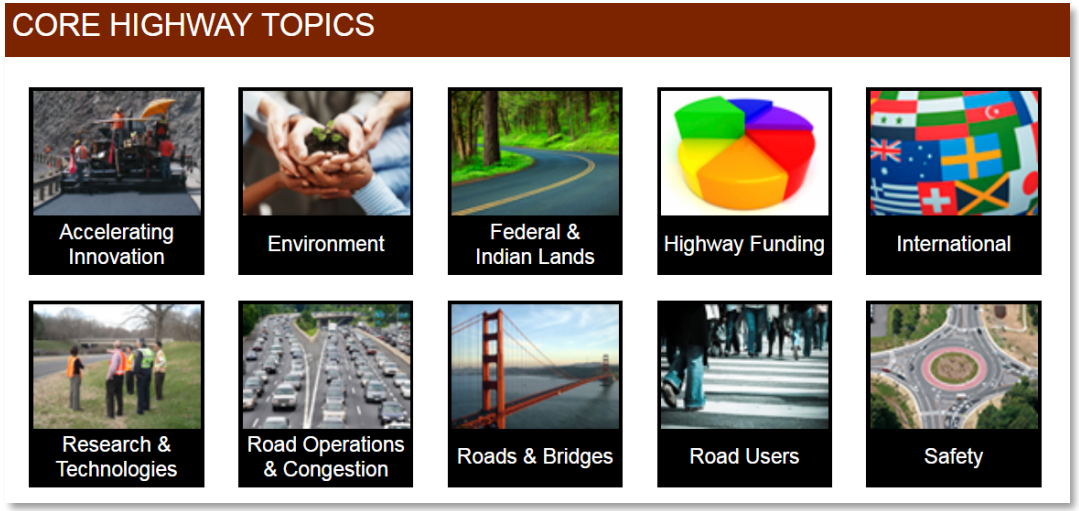
FHWA Authority and Role

FHWA has multiple roles:

- Administers the Federal-Aid Program
- Develops standards for infrastructure and traffic control devices
- Provides guidance to State and local agencies
- Conducts and supports highway research
- Serves as a resource for the transportation community
- and others….



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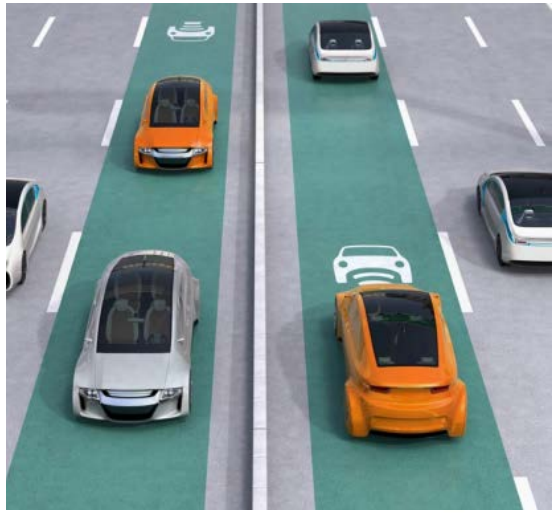
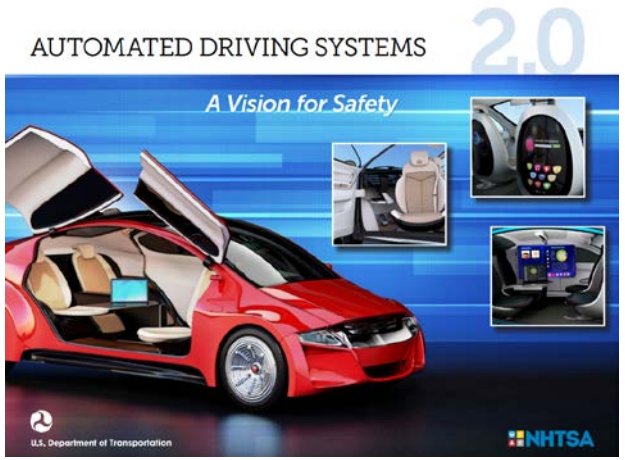
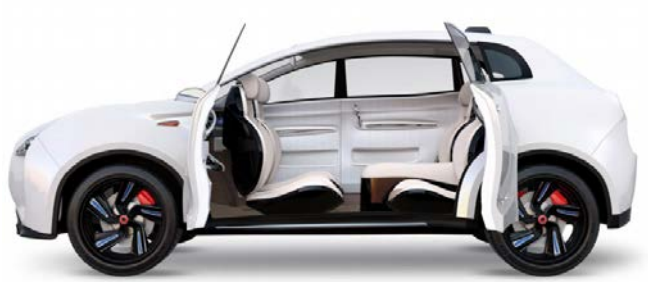
USDOT Activities in Automation

Event	Date
USDOT releases Automated Driving Systems (ADS) 2.0: A Vision for Safety	September 12, 2017
Roundtable on Data for Automated Vehicle Safety	December 7, 2017
Public Listening Summit on Automated Vehicle Policy	March 1, 2018
Automated Vehicles 3.0 release	Late Summer 2018
Work Zone Data Exchange Project	*Ongoing*
V2X Mapping Stakeholder Input	*Ongoing*







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What is *Data for AV Integration*?

- *Access to data* is a limiting factor for AV deployment across all modes
- Data exchanges can help increase access to data across traditional silos
- USDOT is using our convening power to understand critical needs for data exchange and the appropriate federal role to enable them, using a common language

For more information, visit https://www.transportation.gov/AV/Data and see the ***Framework on Data for AV Integration*** *handout.*

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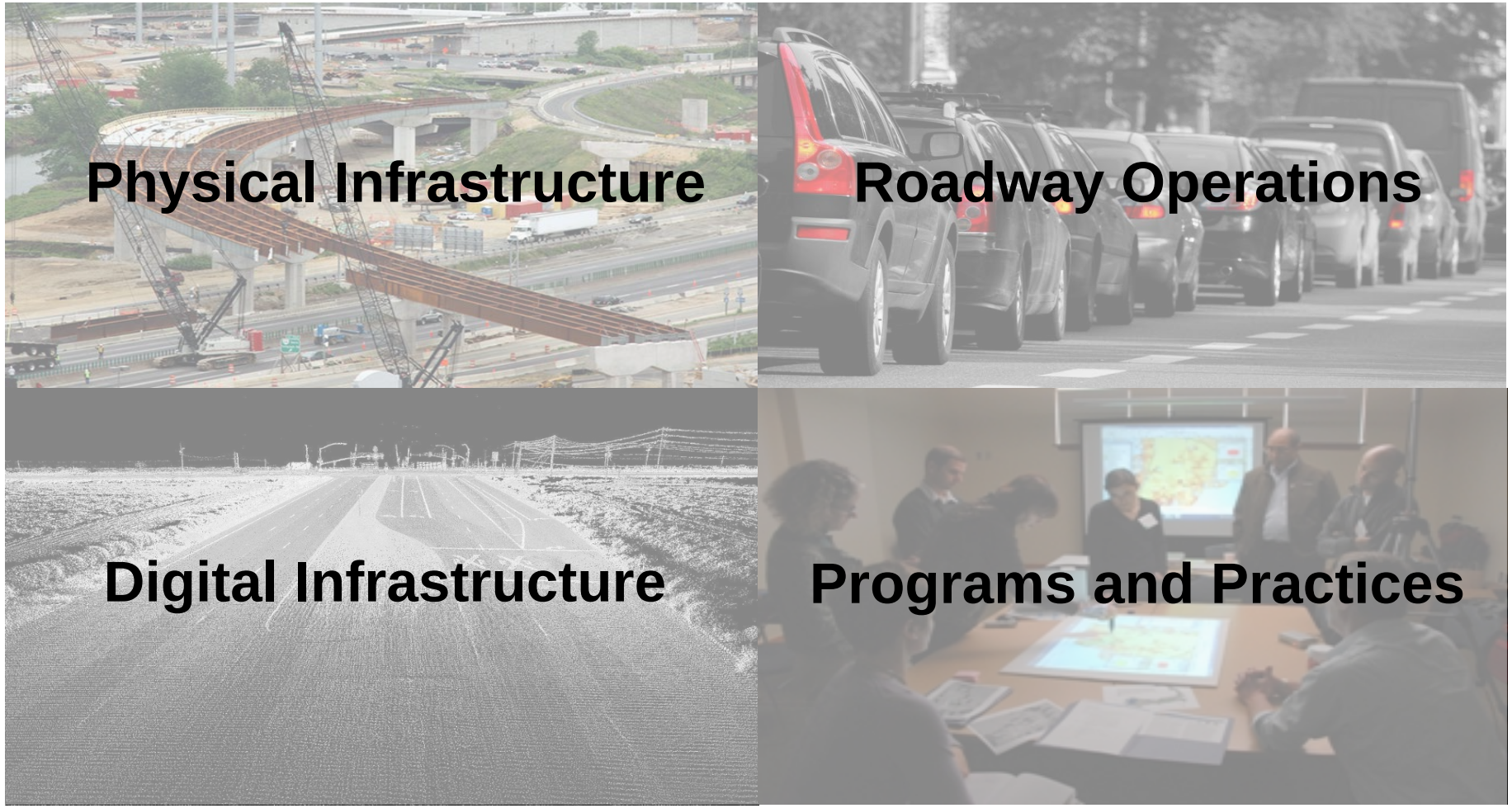
FHWA Released RFI in March 2018

Select Themes

- Greater **Uniformity and Quality** in road markings and traffic control devices would enable automation.
- FHWA should take a **Leadership** role in convening stakeholders to encourage collaboration.
- Certain **Data Elements** about the roadway environment are useful for industry, State, and local DOTs to share and could improve automation operations.
- Conducting **Pilots** and supporting pilot testing are important for facilitating learning and collaboration.
- **Uncertainty** in infrastructure investment and allocation of limited resources are key concerns for State and local agencies.

Automation Has Implications for Roadways



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The National Dialogue on Highway Automation

What is the National Dialogue?

- The Federal Highway Administration (FHWA) is initiating a national conversation with diverse stakeholders to discuss automated vehicles.

- The National Dialogue on Highway Automation is a series of meetings held across the country to facilitate information sharing, identify key issues, and support the transportation community to safely and efficiently integrate automated vehicles into the road network.

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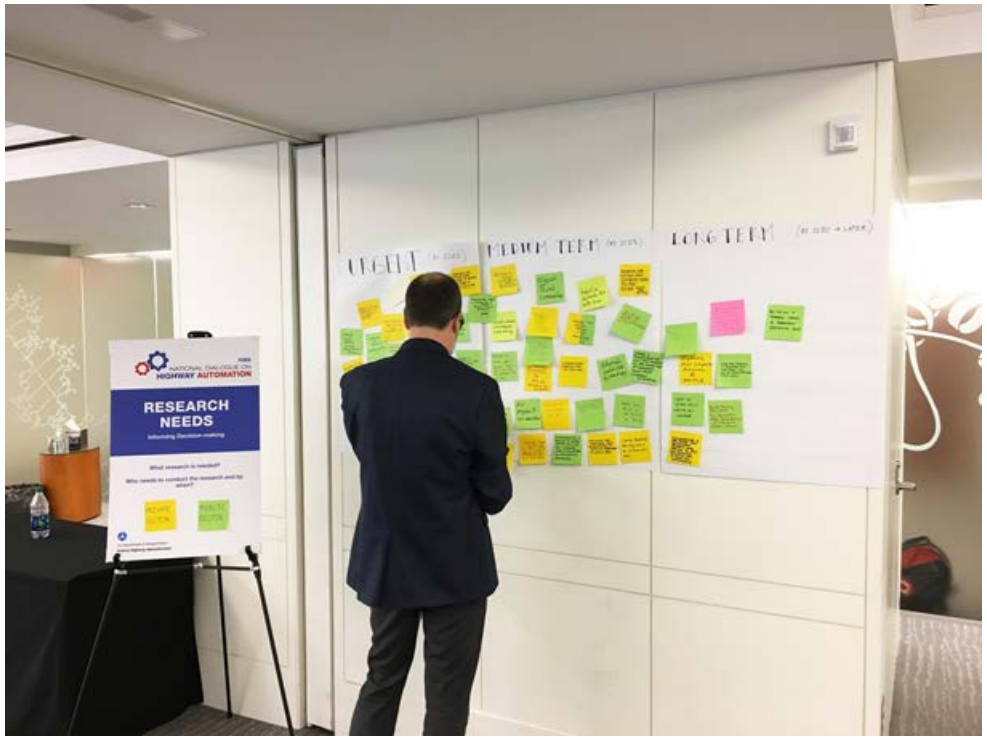
What are Desired Outcomes?

FHWA may use inputs to:

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



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Workshop Schedule

Month	Event	Location
June 7	National Dialogue Launch Workshop	Detroit, MI
June 26-27	National Workshop 1: Planning and Policy	Philadelphia, PA
July 12	Automated Vehicle Symposium FMCSA-FHWA Truck Automation Listening Session	San Francisco, CA
August 1-2	National Workshop 2: Digital Infrastructure and Data	Seattle, WA
September 5-6	National Workshop 3: Freight	Chicago, IL
October 24-25	National Workshop 4: Operations	Phoenix, AZ
Nov/Dec	National Workshop 5: Infrastructure Design and Safety	Texas

Themes: Launch Workshop

- FHWA has a clear role as a facilitator
- A national vision for automation will help clarify goals
- Clear communication about the technology helps to encourage public acceptance
- A lack of consistency (i.e. traffic control devices, policies) can hinder adoption
- Information sharing is important for enabling automated vehicles
- There will be a transition period of a mixed-vehicle fleet, which will require interoperability

Themes: Policy and Planning Workshop

- The transportation planning process may need to evolve to address uncertainty of AV impacts (e.g. congestion, land use)
- Infrastructure investment and funding to raise overall condition enables not only automation, but all road users
- Clearly defining roles and goals will help policy development
- State and local agencies need education, resources, and guidance to support organizational readiness

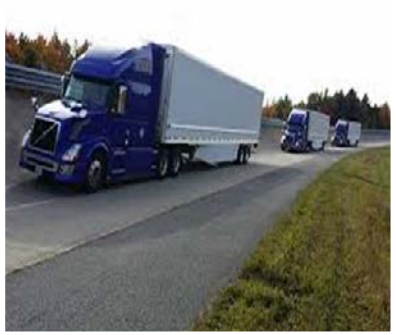
Themes: Data/Digital Infrastructure Workshop

- Data exchange can accelerate safe integration of AVs (see next slide)
- Important to achieve data standardization where useful and tangible
- Lifecycle management and upkeep of data is an emerging issue
- Further clarity needed around digital mapping --- who is building, level of detail needed, Federal role
- Above activities may necessitate development and linkage of systems and technologies

Freight

Opportunity Areas for Freight

Truck Platooning



- *Increased efficiency*
- *Reduced fuel consumption*

Long-Haul

- *Early deployment opportunity?*
- *Improve safety*
- *Minimize driver fatigue*

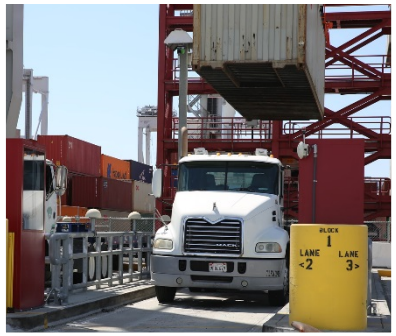
Driver Comfort

- *Increase driver retention*
- *Address driver shortage*

Urban Freight Delivery

- *Last-mile of delivery*
- *Efficiency gains/cost improvements*
- *Sidewalk robots?*

Drayage and Intermodal



- *Automate container movements*
- Rail intermodal connections

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Potential Issues for Discussion

- What are potential infrastructure impacts (e.g. size/weight impacts to bridges)?
- What are the different distribution networks and implications for roadway infrastructure (e.g. additional facilities near highway access points)?
- How will automated commercial motor vehicles (CMVs) navigate complex roadway environments and conditions?

Potential Issues for Discussion

- How will automated CMVs change operation of the supply chain and what will be the impacts on the transportation network?
- How could automation, combined with freight industry trends impact congestion?
- How will automated commercial vehicles interact of with general traffic?
- Others?

Workshop Agenda – Day 1

Time (CT)	Agenda Item
1:00 PM	Introduction
1:10 PM	Opening Remarks
1:10 PM	National Dialogue Overview
1:30 PM	Small Group Instructions
1:35 PM	Small Group Session 1: Roadway infrastructure and condition
2:45 PM	Small Group Session 1 Report Out
3:30 PM	Break
3:45 PM	Collaboration Corner
5:00 PM	Wrap Up and Preparation for Day 2
5:30 PM	End of Day 1

Workshop Agenda – Day 2

Time (CT)	Agenda Item
8:00 AM	Kick-Off Day 2
8:15 AM	Instructions for Small Groups
8:20 AM	Small Group Session 2: Operational design domains and safe traffic operations
9:20 AM	Small Group Session 2 Report-Out
10:00 AM	Break
10:20 AM	Preparing for Automated Vehicles: Freight Perspectives
11:30 AM	Lunch (not included)
1:00 PM	Small Group Session 3: What's Next?
2:30 PM	Wrap Up and Next Steps
3:00 PM	End of Day

Contact:
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