

# Federal Highway Administration

---

## National Dialogue on Highway Automation: June 7, 2018 Launch Workshop Summary

---



August 2019



U.S. Department  
of Transportation

**Federal Highway  
Administration**

### **Notice**

This document is disseminated under the sponsorship of the U.S. Department of Transportation (USDOT) in the interest of information exchange. The U.S. Government assumes no liability for the use of the information contained in this document.

The U.S. Government does not endorse products or manufacturers. Trademarks or manufacturers' names appear in this report only because they are considered essential to the objective of the document.

### **Quality Assurance Statement**

The Federal Highway Administration (FHWA) provides high-quality information to serve Government, industry, and the public in a manner that promotes public understanding. Standards and policies are used to ensure and maximize the quality, objectivity, utility, and integrity of its information. FHWA periodically reviews quality issues and adjusts its programs and processes to ensure continuous quality improvement.

Cover Photo Source: Federal Highway Administration Office of Operations

## TECHNICAL REPORT DOCUMENTATION PAGE

1. Report No. FHWA-HOP-19-023	2. Government Accession No.	3. Recipient's Catalog No.	
4. Title and Subtitle Federal Highway Administration National Dialogue on Highway Automation: June 7, 2018 Launch Workshop Summary		5. Report Date August 2019	
		6. Performing Organization Code:	
7. Author(s) Michael Kay, Anita Kim, Kevin McCoy, Aaron Jette, David Perlman, Kirsten Van Fossen, Matt Cuddy, Stephanie Fischer		8. Performing Organization Report No.	
9. Performing Organization Name and Address Volpe National Transportation Systems Center U.S. Department of Transportation 55 Broadway Cambridge, MA 02142		10. Work Unit No.	
		11. Contract or Grant No. 693JJ318N300070 HOTM180058PR	
12. Sponsoring Agency Name and Address  Office of Operations Federal Highway Administration 1200 New Jersey Avenue, SE Washington, DC 20590		13. Type of Report and Period Meeting summary, June 2018	
		14. Sponsoring Agency Code	
15. Supplementary Notes Project Manager: John Corbin, Office of Operations			
16. Abstract The Federal Highway Administration (FHWA) initiated the National Dialogue on Highway Automation (National Dialogue) workshop series. The National Dialogue was a series of meetings held across the country to facilitate information-sharing and to engage the transportation community in a conversation focused on how to safely and efficiently integrate automated vehicles into the road network. This document summarizes the key themes discussed among participants from the June 2018 National Dialogue workshop held in Detroit, Michigan.			
17. Key Words Automated vehicles, National Dialogue, Highway Automation		18. Distribution Statement No restrictions.	
19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21. No. of Pages 17	22. Price

# Contents

- Overview .....1**
- Workshop Takeaways .....2**
- Workshop Design .....5**
- Breakout Session I: Issues and Challenges .....6**
- Breakout Session II: Developing New Models for Partnering.....8**
- Conclusion .....9**
- Appendix A: Participants.....10**
- Appendix B: Workshop Agenda.....12**

# Overview

Automated vehicles (AVs) have the potential to transform the Nation's roadways. They could increase vehicle safety, improve transportation system efficiency, and enhance mobility for many people who may be unable to drive today. Although they offer a wide range of benefits, they may also introduce uncertainty for the agencies responsible for the planning, design, construction, operation, and maintenance of the Nation's roadway infrastructure.

In June 2018, the Federal Highway Administration (FHWA) initiated the National Dialogue on Highway Automation (National Dialogue), a series of meetings held across the country to facilitate information sharing and engage the transportation community in a conversation on how to safely and efficiently integrate automated vehicles into the road network. A diverse group of stakeholders provided input on key issues regarding automation. This input helps to inform future and existing FHWA research, policies, and programs.

The National Dialogue series consisted of six national workshops, each held in a different location and focused on a unique topic: policy and planning, data and digital infrastructure, freight, operations, and infrastructure design and safety. The workshop series kicked off with an introductory webinar in May 2018. More information about the webinar and meetings is available on the FHWA National Dialogue on Highway Automation [website](#).<sup>1</sup>

## Workshop Objectives

The FHWA identified several objectives for the workshop series:

- Gain an understanding of potential impacts of automated vehicles on national highway infrastructure, safety, policy, operations, and planning.
- Prioritize actions to inform the integration of automation into existing FHWA programs and policies.
- Create models for sustained information sharing among public agencies and the private sector. Support newly developed partnerships among these organizations and define a clear path of communication among FHWA and automation stakeholders.
- Gather insights from infrastructure owners and operators and inform the development of possible technical guidance actions at the Federal level.
- Validate or provide direction into highway research priorities and roles among FHWA, national partner organizations, industry, and State and local governments.
- Develop an engaged national community or coalition on integrating automated vehicles into the roadway system, using inputs from States, local governments, industry, and associations, alongside FHWA and other Federal agencies.

---

<sup>1</sup> <https://ops.fhwa.dot.gov/automationdialogue/index.htm>.

## Launch Workshop

On June 7, 2018, the FHWA kicked off the National Dialogue with a Launch Workshop in Detroit, Michigan, as part of the Intelligent Transportation Society of America 2018 Annual Meeting. The workshop focused on three discussion areas:

- Perspectives on the priorities and challenges in integrating automated vehicles into the national transportation system.
- FHWA roles and responsibilities to assist in the advancement of highway automation.
- Input on the design and structure of the National Dialogue series.

Nearly 200 participants from industry, government, academia, and interest groups participated. This document summarizes key themes that participants raised throughout the breakout sessions. The views in this document reflect participants' inputs and do not represent official positions, policies, or statements of the FHWA or the U.S. Department of Transportation (USDOT). In addition, the document includes participant ideas, regardless of their consistency with FHWA's or USDOT's legal authorities.

# Workshop Takeaways

## FHWA Has a Role as a Facilitator

Workshop participants discussed how FHWA could act as a facilitator to conduct outreach and engage a diverse set of partnerships around automation. Integrating AVs into the transportation system requires varied groups of stakeholders to work together. There is a need to convene State and local agencies, vehicle manufacturers, technology companies, associations, advocacy groups, and the public to enable collaboration. In particular, State and local agencies are looking for a better understanding of how AV technologies interact with the roadway infrastructure and seek to engage with industry to address this question. FHWA could play a potential role in supporting this type of discussion. Several participants suggested creating forums to facilitate dialogue between agencies and industry regarding priorities, challenges, and joint initiatives to enable automation.

## **A National Vision for Automation Will Help Clarify Goals**

There was discussion regarding the need for a clear vision for automated vehicles. Many referred to the need for a “moonshot” vision for the deployment of AVs. This vision can help stakeholders identify priority areas and action items, both in the short and long terms. A national vision could describe an automated future that is achievable through a defined series of actionable goals. This vision should also describe clear milestones for different timeframes, such as pre-AV deployment, mixed-fleet transition, and full AV deployment.

There may be a need for the USDOT and other Federal agencies to reaffirm their priorities regarding the integration of automated vehicles into our roadway system. There is an interest in how government roles at different levels (e.g., Federal, State, and local) need to be more clearly defined. The roles of differing government agencies, even within the USDOT, are not always evident. There is an interest in identifying clear roles for industry stakeholders and their objectives in advancing AVs. Stakeholders desired engagement with USDOT in developing this national vision or strategic framework for AVs.

## **Clear Communication and Outreach Can Help Encourage Public Adoption**

Public perception regarding automation varies widely, ranging from optimistic expectations to a strong distrust in the technology. It may be necessary to recognize and address both sides of public opinion by managing perceptions and assessing public attitudes toward adopting new technologies. Workshop participants noted a potential USDOT role in supporting clear communication by providing consistent messaging and coordination across national organizations. In particular, the USDOT could help engage nontraditional partners (such as emerging technology companies) to support the use of terminology and language that is accessible to all stakeholders. Regarding outreach, participants felt that there are too many workshops and events on automation, making it difficult to assess which events to attend and how they differ. One suggestion was to establish a clearinghouse or a recognized source of information about automation-related events.

## **A Lack of Infrastructure Consistency Can Hinder Adoption**

Inconsistencies in roadway infrastructure design and condition may be challenging for automated vehicle technologies. For example, inconsistent or unclear signage may be confusing or cumbersome for AV technologies as they try to interpret the roadway environment. Several noted the importance of having uniform traffic control devices and infrastructure design to support roadway readiness for AVs. Creating consistency across the roadway environment would require substantial coordination with industry and State and local agencies. There may also be a need for a flexible approach toward infrastructure planning to accommodate the rapid development of AV technologies. Although greater consistency in the roadway infrastructure was an overall theme raised throughout the workshop, there was acknowledgment of the risk of designing infrastructure for a technology that could dramatically change or become obsolete.

Overall, participants suggested that agencies plan for AVs with an approach that is performance-based, standards-oriented, and technologically flexible and agnostic.

### **Information Sharing Can Be Useful for Automated Vehicles**

Data and information-sharing were raised as important for supporting safe and efficient integration of AVs. Certain types of data and information about the roadway may need to be exchanged to support efficient AV operations. Specifically, participants discussed how a secure digital infrastructure could help facilitate information exchanges between vehicles and infrastructure. Having a national data architecture could also help support data exchange, enhance interoperability, and improve data quality. It was suggested that the USDOT could act as a clearinghouse for AV-related data, as well as provide resources for further research and development of best practices. One suggested approach was to develop a central source of information regarding AVs that could be used to house information received from the National Dialogue, as well as best practices, guidance, and other items.

### **Mixed-Fleet Transition Period Will Require Interoperability**

Discussion during the workshop emphasized how not all vehicles will be at the same level of automation at once, but rather, there will be a mixed vehicle fleet that includes automated, partially automated, and non-automated vehicles for a long time. The roadway environment will need to accommodate all vehicles and road users during this transition period. In addition, participants discussed how AVs will continue to increase the ranges and types of environments in which they operate over time.



# Workshop Design

The workshop began with an overview presentation describing the National Dialogue and USDOT activities in automation. The overview presentation is available on the FHWA National Dialogue [website](#).<sup>2</sup>

National Dialogue attendees also participated in two breakout sessions. The first session focused on identifying the key issues and challenges for integration of automated vehicles into the roadway systems and the related role of FHWA. The second session focused on identifying mechanisms for public sector and industry collaboration. Breakout session discussion questions included:

- From your perspective, what is the biggest challenge for enabling automated vehicles on roadways?
- What should FHWA be doing to facilitate partnerships and collaboration among various stakeholders interested in automated vehicle adoption?
- What existing collaborative forums are you aware of that might be useful for FHWA to participate in to further the objectives of the National Dialogue?
- In your opinion, what are the pitfalls to watch out for in the development of these partnerships?
- What should be the FHWA role in supporting “roadway readiness” for highway automation?
- In addition to the five National Dialogue focus areas, what additional topics or questions should be covered?

---

<sup>2</sup> <https://ops.fhwa.dot.gov/automationdialogue/index.htm>

# Breakout Session I: Issues and Challenges

This section summarizes the discussion from breakout session 1. During this session, participants were asked the following questions:

- In addition to the five National Dialogue focus areas, what additional topics or questions should be covered?
- From your perspective, what is the biggest challenge for enabling automated vehicles on roadways?

## Public Education and Outreach

Supporting public adoption of AVs will require a coordinated effort among the public and private sectors to spread consistent and accurate information to all road users. Public education and outreach efforts can help manage expectations, inform appropriate use, and build public confidence in automation technology. Participants expressed the need for clearly explaining the deployment timeline and capabilities of automated vehicle technologies. This can help stakeholders consider the implications of automation for consumers, public agencies, and technology developers. Participants believed that FHWA has a role in conducting education and outreach to its stakeholders (e.g., State and local agencies) and the general public. Some suggested that more communication with elected officials at the State and Federal levels could foster national consistency in messaging and support a full understanding of the issues around automation. Lastly, participants suggested that FHWA could share lessons learned to inform pilot testing and create educational materials for a wider audience.

## Infrastructure Funding

Workshop participants discussed the need for information about funding for infrastructure that supports automated vehicles. This could reduce confusion by clarifying funding eligibility, priorities, and procurement rules. Some suggested that Federal oversight of funding for projects and initiatives could help prevent the duplication of investments on a local level. Another major concern was maintenance of roadways and its implications for AVs. Improving the conditions of the current roadway infrastructure (e.g., pavement quality, lane markings, signage) may support automated vehicle operations on the roadways, therefore stakeholders were eager to understand the maintenance needs and potential funding resources available. Participants acknowledged a potential need to balance funding for maintenance with new infrastructure projects to support automated vehicles. They recommended exploring the eligibilities within existing FHWA programs, such as the Congestion Mitigation and Air Quality Improvement (CMAQ) Program and Highway Safety Improvement Program (HSIP), to support the needs.

As automated vehicles become more widely adopted, some participants suggested that funding

shift from a system of competitive grants to dedicated funding. Others encouraged finding innovative funding mechanisms, such as funding challenges or competitions, establishing collaborative projects, or developing educational initiatives.

### **Cybersecurity and Privacy**

Cybersecurity threats, such as network disruptions, spoofing attacks, and denial-of-service attacks, create significant concerns about the safety and security of AVs. Participants recommended working closely with the automotive and telecommunications sectors to support cybersecurity in AVs. There was concern around AVs creating a stream of information about an individual's travel choices. Other questions raised in the discussion also involved data security, including what type of data will be collected, how it will be used, who has access to the data, and how it will be protected.

### **Liability**

There is uncertainty regarding the nature of insurance and liability. Participants suggested that liability may shift toward automotive manufacturers and questioned the implications for technology adoption. In addition, legal structures will need to be in place to determine liability allocation in crashes involving AVs. States, which are the primary regulators of insurance, will need to address this challenge and may desire guidance from FHWA.

# Breakout Session II: Developing New Models for Partnering

This section summarizes the discussion from breakout session II. During this session, participants were asked the following questions:

- What should FHWA be doing to facilitate partnerships and collaboration among various stakeholders interested in automated vehicle adoption?
- What existing collaborative forums are you aware of that might be useful for FHWA to participate in to further the objectives of the National Dialogue?
- In your opinion, what are pitfalls to watch out for in the development of these partnerships?
- What should be the FHWA role in supporting “roadway readiness” for highway automation?

## Taking Action

The outcome most participants wanted to see following the National Dialogue is an action plan with a clear set of priorities that are collaboratively identified with stakeholders. The discussion revealed a desire for FHWA and USDOT to be able to set clear, actionable goals and work with all partners and stakeholders to achieve them. Sustaining the conversation will be necessary to stay flexible as AV technology changes. Priorities that FHWA could consider for now include funding pilots and testing and creating a national description of “roadway readiness” through levels and standards.

## Continuing the Conversation

Participants noted differing levels of interest and abilities among States in preparing for AVs. In addition, many participants believed that industry is moving rapidly and public agencies may find it challenging to keep up. Their suggested remedy was to continue communication among diverse stakeholders about what they can be doing to prepare for AVs. Participants suggested the use of collaborative forums for engaging participants from industry associations, interest groups, university and academic institutions, technology and data companies, telecommunications companies, State and local agencies, insurance and liability companies, rental car and rideshare companies, and international organizations.

## Standardizing the Roadways

Participants believed that standardized signage, traffic control devices, and lane markings may support AV operations. Workshop participants explored how FHWA could work with other agencies to update the Manual on Uniform Traffic Control Devices to address infrastructure standardization. In addition, legislation, regulations, policies, and safety standards were also identified as areas where greater consistency could be helpful. Participants noted the importance of harmonizing policies to support multijurisdictional challenges as AVs will inevitably cross State lines and operate nationally.

## Providing Local Guidance

Several participants remarked on the limited Federal engagement with State and local governments on automated vehicle issues. They felt that FHWA could enable and support collaboration among States to understand and clarify any uncertainties about jurisdictional roles that may exist at the State and local levels. Some participants discussed and supported flexibility for localities to adopt new technologies—including those pertaining to automated driving systems—at their own pace to accommodate varying levels of fiscal and organizational capacity. Participants suggested that FHWA could provide guidance on how to draft laws and regulations, implement new technologies, identify funding sources, train staff in best practices, and educate the public about AVs.

# Conclusion

The National Dialogue on Highway Automation’s Launch Workshop revealed stakeholders’ diverse interests related to automated vehicles. Overall, stakeholders desired further discussion and information-sharing around automation. The FHWA plans to use the input provided from the workshop series to help inform future policies, research, and programs. Additional information regarding the workshop series and related initiatives is available on the FHWA National Dialogue [website](https://ops.fhwa.dot.gov/automationdialogue/).<sup>3</sup>

---

<sup>3</sup> <https://ops.fhwa.dot.gov/automationdialogue/>

# Appendix A: Participants

Nearly 200 participants from 158 organizations attended the Launch Workshop of the National Dialogue on Highway Automation.

1.21GigaWatts	3M	8 Mile Logistics
A NICE CITY	Accenture	AECOM
AGC Automotive Americas	Alliance of Automobile Manufacturers	ALSO Security
American Association of State Highway and Transportation Officials (AASHTO)	American Automobile Association (AAA)	American Center for Mobility
American Tower Corporation	American Traffic Safety Services Association (ATSSA)	American Traffic Solutions
American Trucking Associations (ATA)	Apple	Arizona Department of Transportation
AT&T	Athey Creek Consultants	Austin Transportation Department
Automotive Safety Council	Autotalks	Avittor International Corp
AWARN Alliance	BAE Systems	Booz Allen Hamilton
California Department of Transportation (Caltrans)	CDM Smith	Center for Automotive Research
Cisco Systems	City of Cambridge	City of Carlsbad
City of Sunnyvale	Colorado Department of Transportation	Connecticut Department of Transportation
Continental Automotive Systems	CRH Americas	Dallas Area Rapid Transit (DART)
Delaware Department of Transportation	Denso Corporation	Derq
District of Columbia Department of Transportation	Dow Coating Materials	Florida Department of Transportation
Ford Motor Company	Fujitsu Laboratories of America	Gannett Fleming
General Motors	Government of Quebec	Governors Highway Safety Association
HARMAN	Hawaii Department of Transportation	HERE Technologies
Highway Industry Development Organization (HIDO)	Hitachi Automotive Systems Americas	HNTB Corporation
HW Lochner	iCone Products	ICX Transportation Group
Imaging Solutions Group	Institute for Transportation at Iowa State University	Institute of Transportation Engineers (ITE)
Intel	Intelligent Transportation Society of America (ITS America)	Intelligent Transportation Society of Japan (ITS Japan)
INVENSITY	Iteris	Jacobs
JobsOhio	JSTI Group	Kapsch TrafficCom North America
KCI Technologies	Kimley-Horn	Lanner Electronics
Leidos	LookingBus	Los Angeles County Department of Public Works

Lumenor Consulting Group	Macomb County Department of Roads	Maine Department of Transportation
Maine Turnpike Authority	Maricopa Association of Governments (MAG)	Maricopa County Department of Transportation
Maryland Department of Transportation	Mazda Motor Corporation	McCain, Inc.
McGurrin Consulting	Mcity	Mercedes-Benz
Mercer Strategic Alliance	Metropolitan Transit Authority of Harris County	Michael Baker International
Michigan State University	Mighty AI	Minnesota Department of Transportation
Mission Secure, Inc. (MSi)	Montana Department of Transportation	National Governors Association
Neusoft Corporation	New Jersey Department of Transportation	NMB Technologies Corporation
Noblis	Nokia Corporation	Northrop Grumman Corporation
OHM Advisors	Oklahoma Department of Transportation	Olsson Associates
Panasonic Corporation	Parsons Corporation	PEMCCO Inc.
Penta Security Systems	Proflexive International	Purdue University
Qualcomm	Quanergy Systems	Region 2 Planning Commission, Michigan
Road Commission for Oakland County (RCOC)	Road Infrastructure Investment Holdings	Robert Bosch LLC
Sam Schwartz Consulting	Sensys Networks	Serco Inc.
SFB Consulting Group	Sheeder Construction Group (SCG)	Signature Technology Solutions, Inc.
South Carolina Department of Transportation	Southeast Michigan Council of Governments (SEMCOG)	Southwest Research Institute (SwRI)
SRG Global	Stanley Consultants	State Road and Tollway Authority (SRTA), Georgia
Texas A&M Transportation Institute (TTI)	Texas Department of Transportation	The Transport Group (TTG)
The University of Texas at Austin	Tome, Inc.	Toyota Motor Corporation
Traffic Management, Inc.	Traffic Products LLC	Traffic Technology Services (TTS)
TRAINFO	Transport Canada	Transportation Research Board (TRB)
TuSimple	U.S. Department of Transportation	University of California, Berkeley
University of Maryland	University of Michigan	University of Wisconsin-Madison
Utah Department of Transportation	Venable LLP	VHB
Virginia Department of Transportation	Washington State Department of Transportation	WSP Global
Wyoming Department of Transportation	ZincFive, Inc.	

# Appendix B: Workshop Agenda

Time (ET)	Agenda Item	Name
7:30 AM	<b>Registration &amp; Sign-In</b>	
8:00 AM	<b>Welcome and Overview of Dialogue Objectives</b>	<b>Martin Knopp, Associate Administrator</b> FHWA Office of Operations <b>Mala Parker, Associate Administrator</b> FHWA Office of Policy and Governmental Affairs
8:15 AM	<b>Overview of Federal Highway Administration Activities</b>	<b>John Harding</b> Connected/Automated Vehicles and Emerging Technologies Team FHWA Office of Operations
8:25 AM	<b>National Organizations Panel</b> National organizations discuss key topics and issues related to highway automation, their roles, and their stakeholder perspectives	Facilitated by <b>Valerie Briggs, Director</b> FHWA Office of Transportation Management <ul style="list-style-type: none"> <li>• Joe Barr, Director of Transportation, City of Cambridge, MA</li> <li>• Steve Gehring, Vice President of Vehicle Safety and Connected Automation, Global Automakers</li> <li>• Jill Ingrassia, Managing Director, Government Relations and Traffic Safety Advocacy, AAA</li> <li>• Russ Martin, Director of Government Relations, Governors Highway Safety Association</li> <li>• Kirk Steudle, Director, Michigan DOT</li> </ul>
9:25 AM	<b>Small Group Session 1</b> Issues and Challenges for Highway Automation <ul style="list-style-type: none"> <li>• Identify key issues and challenges for highway automation and FHWA stakeholders</li> <li>• Inform future Dialogue topics</li> </ul>	All Participants
10:20 AM	<b>Break</b>	
10:30 AM	<b>Remarks and Introduction of Keynote</b>	<b>Shailen Bhatt, CEO</b> ITS America
10:35 AM	<b>Keynote</b>	<b>Finch Fulton, Deputy Assistant Secretary for Transportation Policy</b> USDOT - Office of the Secretary
10:50 AM	<b>Small Group Session 2</b> Developing New Models for Partnering: Bringing Industry, Government, and Associations Together	All Participants
11:45 AM	<b>Next Steps for the National Dialogue</b>	All Participants
12:00 PM	<b>Lunch</b>	
1:00 PM	<b>Open Discussion</b>	Facilitated by <b>Valerie Briggs, Director</b> FHWA Office of Transportation Management
2:00 PM	<b>Adjourn</b> to ITSA Annual Meeting Plenary Session	All Participants



U.S. Department of Transportation  
Federal Highway Administration  
Office of Operations  
1200 New Jersey Avenue, SE  
Washington, DC 20590

Office of Operations Web Site  
<https://ops.fhwa.dot.gov>

August 2019  
FHWA-HOP-19-023