U.S. Department of Transportation Public Listening Summit on Automated Vehicle Policy

Summary Report

July 2018

U.S. Department of Transportation

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This report summarizes automated vehicle perspectives and insights from government, industry, and other experts at the AV 3.0 Listening Session held March 1, 2018, at DOT Headquarters in Washington, D.C.

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Executive Summary

The U.S. Department of Transportation (DOT) brought together hundreds of transportation stakeholders for its *Public Listening Summit on Automated Vehicle Policy* on March 1, 2018, in Washington, D.C. Experts in industry, government, labor, and advocacy, as well as members of the general public, provided valuable insights on how DOT can help safely integrate automated vehicles (AVs) into the Nation's transportation system. This summit built on the conversation that began with *[Automated Driving Systems 2.0: A Vision for Safety](https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/13069a-ads2.0_090617_v9a_tag.pdf)*[1], and continued the Department's multimodal, unified approach to AV policy.

This public listening summit allowed a diverse group of stakeholders to bring their ideas, reactions, and concerns directly to DOT staff to inform AV policy development. The Department designed the summit with these goals in mind:

- Offer insights and perspectives on AV integration from keynote speakers, expert stakeholders, and panelists.
- Identify priority Federal and non-Federal activities that can accelerate the safe rollout of AVs.

The summit began with roundtable breakout discussions among transportation stakeholders representing a range of groups and topics, including:

- Public Safety and First Responders
- Disability and Accessibility
- Consumer and Public Education
- Insurance and Liability
- Employment Issues
- Cybersecurity

Roundtable participants identified their needs and key areas of concern related to AV integration, and provided feedback on the roles they would like DOT to have. Participants provided their own views, and DOT did not seek or encourage consensus.

Following the roundtables, several hundred members of the public heard perspectives on AV integration during panel sessions featuring distinguished speakers from industry, State and local government agencies, and DOT modal agency executives.

This report summarizes the roundtable discussions and the views that panelists provided during the public session. The views and opinions in this report do not necessarily reflect the Department's views. However, DOT will consider these perspectives in upcoming AV policy documents, guidance, and strategy. The Department plans to address most of the stakeholder questions and concerns that were identified during this event in the upcoming Automated Vehicle 3.0 document, as early as summer of 2018.

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[1] https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/13069a-ads2.0_090617_v9a_tag.pdf

Keynote Addresses

Secretary of Transportation, Elaine L. Chao

I am pleased to join you today to continue the national conversation about autonomous vehicles. It's an exciting time for the future of our Nation's transportation. Autonomous technology—including automated cars, trucks, and drones—have the potential to revolutionize the way we travel, transport goods and connect with one another. Among its benefits, this technology could increase access to transportation—especially for our elderly and people with disabilities. And it has the potential to help decrease highway fatalities and injuries by addressing the root cause, which is human error. As you may know, human error is a factor in 94 percent of all highway accidents. In fact, autonomous technology can help improve safety across all modes of transportation, not just automobiles. But there are challenges, as well.

The public has concerns about the security and privacy of automated technology as well as the potential for hacking. Can they operate safely alongside human-operated systems? In January, the American Automobile Association reported that 63 percent of U.S. drivers are afraid to ride in a fully autonomous vehicle. That's down from 78 percent reporting such fears in early 2017, but it is still a majority. Policy makers are also concerned about the potential impact of autonomous technology on the workforce. New technologies create jobs, but the transition period can be very difficult for dislocated workers. So, this needs to be addressed to help workers adapt to this new world.

Addressing these challenges requires good information. So, the Department is holding this summit and taking other steps to gather information as it moves forward on the regulatory front.

On January 10, 2018, the Department published the first of four in a series of formal requests for public feedback to help identify barriers to innovation. They include:

- One, from the National Highway Traffic Safety Administration, asking for insights regarding regulatory barriers for AV.
- Two from the Federal Transit Administration that address AV bus technology, research and barriers.
- One from the Federal Highway Administration that addresses infrastructure technologies for the safe integration of AVs.

These can be found on transportation.gov/av or the Federal Register.

Several more will be published in the near future by the modes, including:

- The Federal Motor Carrier Safety Administration is requesting public comments on existing Federal Motor Carrier Safety Regulations that may need to be updated, modified, or eliminated to facilitate the safe introduction of automated technology on commercial motor vehicles.

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- The Pipelines and Hazardous Materials Safety Administration is requesting information on matters related to the development and potential use of automated technologies for surface modes.
- The Federal Railroad Administration is requesting information and comment on the future of automation in the railroad industry.

When the first guidance—ADS 2.0: A Vision for Safety—was released on September 12, 2017, work was already underway on AV 3.0. I have to tell you something about ADS 2.0. It has been one of the most-viewed DOT policy documents–ever. Since it was released, only six months ago, it has been downloaded more than 125,000 times.

AV 3.0 could be released as early as summer 2018 and will be revised as often as needed. Stakeholder input has already led to an expanded scope for AV 3.0. It will be multimodal, and include various surface transportation systems, such as mass transit, rail, and trucking. So, many thanks to all of those who responded.

Let me share with you the six basic principles the Department has developed to guide its work on autonomous vehicle policy:

- *First, safety remains the Department's top priority.*
- *Second, the Department's approach will be flexible and tech neutral, not top down, command and control. We are not in the business of picking winners or losers. The market will help determine the most effective solutions.*
- *Third, when regulations are needed, they will be as non-prescriptive and performance-based as possible. At the same time, in all our regulatory actions and policy decisions going forward, the Department will not automatically assume that the driver of a vehicle is a human – it may be a computer.*
- *Fourth, the Department will work with the States and other authorities to avoid a patchwork approach that could inhibit innovation and make it more difficult for automated vehicles to cross state lines.*
- *Fifth, the Department will provide stakeholders with guidance, best practices, pilot programs, and other assistance to facilitate the safe integration of automated vehicles into our transportation system. The Department will also prepare for complementary technologies that enhance the benefits of automation, such as vehicle-to-vehicle and vehicle-to-infrastructure communications.*
- *And sixth, the Department recognizes that there will always be the need for autonomous vehicles to operate side-by-side with traditional vehicles, in both rural and urban areas. We will not assume universal implementation of these technologies.*

Many states and localities are already experimenting and testing autonomous vehicles. The Department is monitoring this on-road testing of AVs, and hopes to use this information as it addresses key regulatory issues.

The goal is to develop common sense regulations that do not hamper innovation, while preserving safety. In the coming weeks, the Department will post a report-out on the work sessions completed here today. So, let me encourage you to comment and provide feedback on as many of the six sessions as you can—your input is valued. The sessions address key multi-modal issues, including concerns regarding Public Safety and First Responders, Disability and Accessibility, Public and Consumer Education, Insurance and Liability, Employment and Labor Issues, and Cyber Security.

Let me close by noting that creativity and innovation are part of the great genius of America—one of its hallmarks. We must nurture and preserve this legacy. Working together, we can help usher in a new era of transportation innovation and safety, and ensure that our country remains a global leader in autonomous technology.

So, thank you for joining us today, and the Department looks forward to working with you on these important issues[2].

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[2] https://www.transportation.gov/AV/avsummit

Under Secretary of Transportation Policy, Derek Kan

At the Department of Transportation, Secretary Chao has articulated three main priorities. One, safety; two, infrastructure; and three, preparing for the future by engaging with new technologies to ensure safety without hampering innovation. And as the Secretary always reminds us, safety is the Department's highest priority. Everything we do must be looked at through the lens of safety. And it's truly a pleasure working for this Secretary because she gets it. She understands that we need to balance innovation with the public's legitimate concerns around safety, security, and accessibility.

Now, we've heard for years how AV technology is going to disrupt transportation, and these days we talk often about how this will be, perhaps, the most consequential period in autonomous vehicle policy development. So today I wanted to talk about two things. One, what makes this point in time truly unique? And two, I want to expand upon what the Secretary just talked about in terms of the six key principles around AV 3.0.

The core research that enables autonomous vehicles has been around for decades. However, the convergence of technology, users and an enabling ecosystem is creating the conditions for autonomous vehicles to be deployed around the world. Transportation has been based upon optimizing around a few basic questions. How do you move as far as possible, as fast as possible, as cheaply as possible? Or, put another way, we optimize transportation around distance, time and cost. For centuries, we've sought more efficient modes of transportations, from ships, to locomotives, to airplanes, to jets. We have always sought more efficient ways to build bigger, faster, and cheaper modes of transportation. Yet today, the way we are optimizing transportation very differently. We are using data and new technologies to optimize transportation.

The first variable that makes this period unique is technology. Technology incorporates new things like LiDAR and artificial intelligence. Not only do we have these new technologies, but they are also highly accessible. In this room alone, we have over 1,000 high-resolution cameras in our pockets. Twenty years ago that would seem like a fantasy. And, not only do we have 1,000 cameras, we have the ability to stream video, which five years ago would have sounded ridiculous. Not only do we have hardware like LiDAR and high-resolution cameras, but we also have massive computing and data processing power. And finally, this technology is cheap, accessible and accurate.

The tech world oftentimes talks about product market fit, and while industry may have created a product, an open question always is if the market is ready for this product. Today, we're seeing an emerging market for new users. While there are some that are wary of autonomous vehicles, we have a growing population that is very open to new technologies. Market research shows that internet usage continues to grow, with the average American spending almost six hours per day with digital media.

The other day I tried calling my mom. She didn't pick up, like she often doesn't. And instead of calling me back, she texted. And, not only did she text back, she used an emoji!

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My mom is about to turn 70, and the fact that she communicates with me by emoji is a great example of how tech-savvy the world has become.

Not only do you have product market fit across multiple modes of rail and trucking, but you also have an enabling ecosystem. This includes thing like legal and regulatory structures, insurance policies, venture capital investors, and infrastructure. There is a robust ecosystem that supports products and markets, and that's where all of us in this room come in.

We have representatives from advocacy groups around safety to disability access, to first responders, to state and local leaders. Each of you are part of this enabling ecosystem that will play a critical role in shaping the future. AVs have the potential of not only improving safety, but also improving mobility for underserved communities, such as low-income, disabled, and elderly communities.

Today is special because of the convergence of available, accessible technology, a market of users willing to test this technology, and an ecosystem that supports these technologies. And so this is where the role of the Department of Transportation comes in. We are rapidly developing our AV 3.0 guidance.

AV 3.0 builds upon previous guidance by expanding our focus on integration of automated vehicles throughout the surface transportation system. While 2.0 focused primarily on personal automobiles, 3.0 addresses trucks, rail, ports, highways and more. We have heard questions about whether 2.0 will change our approach to automation and some speculation around the future of voluntary safety assessment letters. We intend to use the approach outlined in the 2.0 document to shape our 3.0 approach to automation, and aren't changing the focus on the voluntary safety assessment letters.

3.0 seeks to do a few things. It seeks to clarify a range of terminologies used in the AV ecosystem. For instance, highly automated, self-driving, and autonomous vehicles are oftentimes used interchangeably. And as policymakers, we have read many of the laws and policies that folks around the country have written, and we use these three terms. States and locals have used these three terms. One of our aspirations is 3.0 will create a standard vocabulary so as we go back to our communities we can speak about these things in a shared understanding of different concepts.

3.0 will also seek to clarify the federal versus state roles of surface transportation. For instance, the design and engineering of a transportation vehicle has traditionally been regulated by the federal government while the operation of a vehicle has traditionally been regulated by the state. DOT sets the federal motor vehicle safety standards, but states set the speed limit and set the legal limits of blood-alcohol levels.

What happens when some of those operations are now done by computer? That is what happens when the driver is now part of the machine. Is that the role of the federal or state government? We hope to clarify some of these questions. At the end of the day, policymakers likely need to answer 10 to 15 key questions. These range from things like, how do you integrate with public safety officials? Should we require the exchange of

data? What are our requirements around privacy or cybersecurity? And how do we address concerns from the disability and elderly communities?

We hope that 3.0 will frame many of these issues and provide solutions and options for cities, states, and policymakers around the world. And so the purpose of today's listening session is to provide input for 3.0. We're here to listen. We have a number of requests for information and requests for comments published, and as the Secretary mentioned, more are on the way. Please provide input to 3.0, as we will incorporate much of what you provide.

Now, the Secretary spoke about six principles and I wanted to just spend the last few minutes providing a bit more information on some of these. She said that safety is the Department's top priority. And so as we think about testing and integrating new technologies, what policies to roll out, what rules to issue, we continue to evaluate if these technologies will truly reduce aggregate risks to the transportation system. And that's important. Instead of looking at specific risks of a single vehicle, we seek to reduce the total risk for the entire transportation system.

The Secretary also talked about a flexible, tech-neutral approach. What we mean by that is we are not going to be selecting what tech kits should be used, what LiDAR should be used, or even if LiDAR should be used. Our approach will be tech-neutral, rather letting the marketplace choose the best approach to safety.

In terms of regulations, when they are needed, they will be as nonprescriptive and performance-based as possible. And what that means is we're looking at ways to evaluate outcomes and not inputs. Instead of a regulation that says, machine must have A, B, and C in a vehicle, we hope to look at how safe a product is at the other end, more similar to a driver's license test than the current system for vehicles.

The Secretary spoke earlier about partnering with stakeholders, and the RFI/RFC process is an important component because it will help us identify specific regulations and policies that inhibit the testing and deployment of new technologies.

Finally, let me say, decades of research on automation and innovation are now becoming real life products. Literally, we are bringing science fiction to reality. And that's the role all of us in this room play. We must ensure that the policy we set, the ground rules, the frameworks, enable all of these technologies. And so we in this room have an obligation to lead and ensure these new technologies truly improve both safety and mobility. Thank you very much.

Roundtable Breakouts: Discussion Design

The Department invited experts in government, industry, labor, and advocacy, including the disability community, to discuss high-priority, cross-cutting topics during morning roundtable breakout sessions. Facilitators encouraged open and candid discussion by using Chatham House rules: insights and opinions would be reported on, but there would be no attribution to participants. Participants provided their own views—these views do not reflect the views of DOT—and DOT did not seek or encourage consensus.

Roundtable Breakouts: Major Takeaways and Challenges

This section summarizes the major takeaways and challenges that roundtable breakout participants identified.

TAKEAWAY: USDOT has a clear leadership role

Participants expect DOT to continue to provide guidance on deploying and using AVs. They want DOT to engage on cross-cutting issues, even where the explicit Federal role is unclear.

Participants offered that DOT leadership can facilitate critical discussions on the technological and policy issues facing AV deployment. Most importantly, DOT is best able to convene discussions with a diverse set of stakeholders. The Department should seek to include all relevant communities—Federal, State, and local governments, industry, and others—in these discussions. Participants appreciated that this summit brought together stakeholders from all modes.

TAKEAWAY: Open, honest communication will encourage acceptance

The Department, AV developers, associations, and others can encourage confidence and acceptance of AV technology by communicating directly with the public on the anticipated benefits of AVs, according to participants. There is a particular role for DOT to play in tackling the broad need for trusted information from reliable sources. To address consumer expectations and potential misuse, it is also important that the public understands the limitations of automation. Participants expressed an urgency for more public and consumer education. There is also a need to better define the roles of industry, government, associations, and other stakeholders, to identify information that is shared and who shares it.

CHALLENGE: Innovation may be stifled if regulations are imbalanced

Participants acknowledged that there is tension between innovation and regulation, as a flexible approach to regulation can encourage technological progress but may weaken certain protections. Many participants want clarity and consistency. Some participants

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believed that even without regulation, manufacturers and other industry players have high incentive to keep their vehicles and customers physically safe, and safe from cyber-attacks. However, some participants expressed concern that if there is too little Federal regulation, a patchwork of state-by-state regulations could arise. A balancing act is required, participants said.

CHALLENGE: Viewpoints differ on who should have access to AV data

Many participants discussed potential ways to use AV data. Insurers and States, for example, are very interested in how AV data can support decision-making, such as for pricing and policy setting, but consumers and AV developers may have concerns with sharing those data. Some participants also believe that AVs can improve responses to emergency situations by providing data on occupant status and incident conditions to first responders, while also providing historical data about incidents, but those data also come with cybersecurity, privacy, and intellectual property concerns.

Roundtable Breakout 1: Feedback and Discussion Summaries

This section summarizes feedback from stakeholders who participated in the first roundtable breakout session, and includes summarized discussion narratives. Participants provided their own views. These summaries do not reflect the views of the Department, and the Department did not seek or encourage consensus.

Public Safety and First Responders

Feedback from the Roundtables

Create ways for safety officials to interact with and control AVs. First responders and public safety officials expressed interest in being able to interact with, direct, and potentially control AVs during emergencies, while acknowledging potential cybersecurity concerns.

Use data to improve emergency response. Participants believe that AVs can improve responses to emergency situations by providing data on occupant status and incident conditions, and historical data about incidents would be richer—but these data could introduce privacy and security concerns.

Ensure AVs can adapt to uncommon events. Participants believe that AVs need to be able to respond to rare and non-routine events, such as going against the normal flow of traffic during an evacuation, minimizing the impacts of cybersecurity attacks, having to maneuver out of the way of an emergency vehicle, or interacting with users who have mobility limitations.

Discussion Summary

Participants identified several ways that AVs may substantially improve first responders' ability to ensure public safety:

- Providing new capabilities in incident and crash analysis, and enhancing vehicle inspection and enforcement.
- Simplifying data recording and entry through standardized information fields in crash report forms.
- Reducing traffic violations and drunk driving, and self-reporting incidents. Law enforcement might then direct more resources to other types of policing.
- Prioritizing first responder mobility during an emergency.
- Protecting workers in work zones, such as with the automated impact protection vehicle[3] on the road in Colorado.
- Responding to incidents faster than first responders can—AVs stationed near a highway could bring water and first aid to a crash scene, potentially even across hazards like downed power lines.

There will be challenges in integrating AVs into first responder activities, participants said. AVs need to be able to respond to uncommon events, such as going against the normal flow of traffic during an evacuation, minimizing the impacts of cybersecurity attacks, moving out of the way of an emergency vehicle, or interacting with users with mobility limitations. Cybersecurity risks could expose public safety to foreign and domestic threats. Some participants said that even if partial automation prevents many crashes before full automation is reached, partial automation could lead to other incidents and crashes because human operators may lack the skill or attention needed in rare instances when they need to take over. One participant suggested that for each level of vehicle automation, vehicles should be able to meet defined sets of emergency response capabilities. For example, AVs at each automation level should be able to take detour routes, or follow hand signals even if that means driving outside of the right of way.

There is a need and demand for educating first responders, and DOT has the opportunity to help. Some participants believed that law enforcement and other emergency personnel will need to know how to identify and communicate with AVs. Police are used to interacting with humans during incidents, not with computers and sensors. Several participants said that first responders would ideally have the ability to start, stop, disable, and reroute vehicles, as they do with human motorists. One example would be using vehicle-to-vehicle and vehicle-to-infrastructure communication technology to prioritize first responder mobility. Participants noted that a potential lack of vehicle-to-infrastructure connectivity in rural areas may lead to disparate levels of public safety in rural and urban communities.

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[3] https://www.codot.gov/news/2017-news/august/cdot-and-partners-drive-safety-with-world2019s-first-self-driving-work-zone-vehicle

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Participants stated that AVs may also fundamentally change how transportation systems are operated. For example, automated transit vehicles without an operator may require new monitoring and law enforcement practices.

Participants also offered that DOT can lead in convening first responders, public safety personnel, and others. In-person discussions stimulate constructive thinking and foster mutual understanding of how first responders should interact with AVs. That understanding of AV technology needs to cut across States and across all levels of government. The Department could also lead and fund pilot projects that can inform best practices and future standards development. The goal is to keep the conversation going, and DOT is in the best position to do that.

Disability and Accessibility Concerns

Feedback from the Roundtables

Provide clear guidance on accessibility requirements for AV technology. There is excitement around the potential of AV technology to improve mobility, but to maximize that potential, clear guidance is needed on accessibility requirements for automated technology. It will be important to define relevant communities and conduct outreach with them before taking action.

Be aware that different disabilities require different accommodations. There are many types of disabilities—affecting mobility, vision, hearing, and cognition—that will require different accommodations.

Standardize auxiliary aides for more uniform adoption. Increased standardization of auxiliary aides, such as lifts for wheelchairs and alternate communication formats for accessible displays, will help ensure mobility and access. These aides are not uniformly designed, and uniformity may become more important for vehicles without a human driver or attendant.

Update the 2002 Transportation Availability and Use Survey. This survey is invaluable, but dated. Several participants suggested updating this study, considering the vast technological advances that have happened since 2002. Survey results from an updated version would help DOT and stakeholders understand the transportation needs of persons with disabilities, and improve decision-making.

Discussion Summary

Participants at every table stressed inclusion, noting that disability and accessibility communities must be included in DOT-led AV discussions. Outreach should go beyond one-off events, and should be consistent. Partnerships inside and outside of DOT are key. There should be engagement with senior citizen communities, accessibility and disability groups, governmental agencies at all levels, AV developers, and others.

Participants said that DOT can promote dialogue with disability and accessibility communities, and across agencies. Intergovernmental communication and data sharing can be encouraged and improved; other departments, such as Labor and Health and Human Services, are also interested in accessibility issues.

Participants expressed their desire for DOT to provide clarity on how Americans with Disabilities Act requirements apply to AVs. Without clarity, substantive dialogue among stakeholders will be difficult, participants said, and AVs with inconsistent levels of accessibility may be brought to market. Entities that test and deploy AVs and submit voluntary safety self-assessments would benefit from more emphasis on accessibility.

It was the view of many participants that the Department can lead by producing research and data so that stakeholders across these communities can make informed decisions. Some participants said they would like DOT to conduct a needs assessment similar to the *2002 Transportation Availability and Use Survey*. There is a need for pilot projects, model deployments, and other research on how AVs can benefit accessibility and disability communities. Existing paratransit options, one participant noted, are very expensive, and users suffer through poor service. AVs may be a less expensive option while providing more reliable, on-demand service. There is also a need for market research on the demand for AVs within accessibility and disability communities. The most prevalent needs can be met only if DOT and other stakeholders understand those needs based on robust, current, and shared data. Rural and other underserved communities—such as socioeconomically disadvantaged communities that may lack access to new technologies—cannot be forgotten in outreach and research initiatives.

Participants pointed out that there are many types of disabilities—affecting mobility, vision, hearing, and cognition—and different disabilities call for different accommodations. For example, a visually impaired person could ride in an AV that is not wheelchair-accessible, but they won't be able to use the vehicle if touch screens are the only available interface. There may be opportunities for universal design, where products are built to be used by the widest number of people possible—could a vehicle tailored to visually impaired individuals also be used by someone who isn't visually impaired? Inside and outside of AVs, inclusive information and communication technology concepts can ensure that vehicles clearly communicate with disabled individuals.

Accessibility goes beyond a single vehicle, participants said. For example, State and local governments will need to rethink how they manage curb space. The need is for a multimodal, systems perspective that ensures door-to-door access, not just curb-to-curb. Will an AV know not to let someone off at a dangerous location? Will AVs lead to the demise of public transit options that many people with disabilities rely on? Participants mentioned that AVs and transit are, in fact, complementary. Clustering AVs around transit stations, for example, can help address concerns about door-to-door access.

Nearly everyone will have a disability at some point in their lives, according to one participant. A systems approach will ensure that disability and accessibility communities reap the full benefits of AVs, and that AVs do not cause inadvertent harm. Dynamic

policies that allow DOT to pivot as new technologies emerge will help improve accessibility for all.

Consumer and Public Education

Feedback from the Roundtables

Use language that everyone can understand. There is a need to communicate about automation technologies in a user-friendly way that includes consistent and driver-centric terminology. The six levels of vehicle automation developed by SAE International can inform technical discussion, but they are less useful for discussions with the public.

Tout the potential benefits of AVs to gain buy-in. To increase consumer confidence, it is important to educate the public on the potential benefits of AVs. It is also important to educate the public on the limitations of automation, to minimize misinformation or misuse. There should be better point-of-sale consumer education, and consumers need hands-on experience with automation technologies. Pilots and demonstrations are effective ways for the public to experience and build familiarity with AVs.

Develop different outreach strategies for different audiences. Public education should come from a variety of sources, including AV developers, associations, and government, and should be tailored to different audiences' needs and evolve with the technology.

Discussion Summary

Many participants explained that the public has widely varying levels of AV knowledge and acceptance, and new technologies always require public education. Other than the invention of the internal combustion engine, the potential safety and mobility improvements of AVs could represent the most ground-shifting change ever to surface transportation, and the communication challenges are concurrently complex.

Until full vehicle automation is reached, the human driver is still going to be the most important safety factor, participants said. A public education campaign from numerous sources will help all surface transportation users understand their responsibilities navigating in and around vehicles that are partially automated.

Public education is a continuous, shifting process, participants said. Outreach campaigns will need to be tailored to specific audiences, and messaging will need to evolve with the technology. Education efforts need to touch on the potential benefits of AVs, their risks and limitations, the importance of transparency in data collection, and frame AVs as providing a service. Consistent, clear, driver-centric terminology that focuses on what the driver is expected to do—not necessarily what the automation does—will accelerate public acceptance. Across modes, there may be challenges in achieving linguistic consistency and clarity. "Auto pilot" means something different to an aircraft pilot than it does to an automated vehicle driver. No matter the mode, clearly expressing the role of the operator will help users understand what AVs can and cannot do. Personal

experience and demonstrations can encourage familiarity and comfort with new technology.

Intermodal and multimodal AV interaction is a particular area of messaging that several participants mentioned. For example, AV manufacturers and the public need to understand how AVs will behave at railroad grade crossings, or how they will interact with vulnerable road users, like pedestrians, bicyclists, and motorcyclists. Similarly, vulnerable road users need to know how AVs will interact with them. The public also needs to be educated on commercial AV applications, such as truck platooning.

Some participants explained that who is communicating and how messages are communicated are important factors to consider. There is no single entity that can educate the public on AVs. Entities should include but may not be limited to government at all levels, non-governmental organizations, manufacturers and other entities, car dealers, driver education outfits, and the media. Broadcast methods may include traditional media, such as radio and television, and newer media, such as smartphone apps, video games, and social media. Celebrity influencers may be effective in educating younger segments of the public on the potential benefits and limitations of AVs. Those who serve as AV educators—in government, industry, and beyond—will themselves need to be educated.

Some participants believe that as people learn about the potential benefits and challenges of AVs, the technology will need a highly public, trusted champion. Secretary Chao might be able to serve in this champion role, according to several participants. Leaders in other parts of the Federal government, such as the Departments of Homeland Security and Commerce, can also serve as AV champions. Before any kind of collaborative AV education coalition begins outreach, a critical question remains: what is the objective? Is it public awareness of AVs? Is it public acceptance of AVs? Defining the objective will help define the outreach.

Roundtable Breakout 2: Feedback and Discussion Summaries

This section summarizes feedback from stakeholders who participated in the second roundtable breakout session, and includes summarized discussion narratives. Participants provided their own views. These summaries do not reflect the views of the Department, and the Department did not seek or encourage consensus.

Insurance and Liability

Feedback from the Roundtables

Communicate that insurance and liability issues are not impediments. Existing insurance and liability frameworks are flexible enough to accommodate new technologies. Insurers will, however, need to shift their framework from driver-based to vehicle/fleet-based.

Convene stakeholders. Insurance is regulated at the State level, but those regulations can have national implications. There is a role for DOT in convening stakeholders, identifying safety benefits, and providing procurement guidance to grantees (for example, for bus procurements).

Collect and analyze data to support decision-making. Insurers and States are very interested in how AV data can support their decision-making, such as for pricing and policy setting.

Discussion Summary

Insurance and liability challenges are often cited as impediments to AV deployment, but participants widely agreed that is not the case and that the existing liability and insurance frameworks are resilient and adaptable. Until the Nation's automobile fleet is fully automated—where the human has zero role operating the vehicle—there will still be crashes and the need for insurance. Even if a fully automated automobile fleet is realized, there will likely still be crashes, and there will still be insurance. The industry will evolve with the technology.

Most participants mentioned the critical role AV data will play in determining new insurance policies, products, and pricing. Non-AV owners may not get rates as favorable as the rates AV owners get, but if total crashes decrease dramatically, then insurance costs overall could go down. Data today is about drivers, but as AV deployment progresses, insurers will need to increasingly consider AV systems—which vehicles have which systems, how well those systems work, and whether consumers have added after-market devices. AV data will lead to more precise information on the number and types of crashes that occur. Still, right now there is limited information on the behavior and risks of automated technologies, and the insurance industry may be challenged to effectively identify risks and establish appropriate insurance rates.

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Data is needed to support a variety of insurance and liability purposes, according to many participants. Data from use-cases help insurers better understand risk and inform policies and decision-making. Operational data helps deliver and modify insurance products. Incident data helps determine fault. Some participants mentioned that AV developers are often not open to sharing data because they have invested significantly in their specialized, proprietary technology. From the AV developer perspective, their responsibility is to the person who bought their vehicle. For example, when a crash happens, an AV developer may not share data with law enforcement unless the customer gives permission. There is also a competitive advantage incentive for AV developers to not share AV data. Commercial insurers have similar challenges. They need the same data from commercial vehicles as personal vehicle insurers need from personal vehicles. Another area of tension is in the procurement of AVs for public transit. Transit agencies have procurement rules that limit their liability. New procurement guidance and models may help relieve this tension.

Participants also identified several short- and long-term priorities:

- SHORT-TERM: Address commercial insurance challenges, such as the availability of commercial liability insurance for fleet operators.
- SHORT-TERM: Research is needed to identify the data that insurers require after a crash, such as how fast a vehicle was going, whether the brakes were engaged, when the vehicle sensed other vehicles, and the direction the vehicle was steering. Insurers would like AV developers to share data with them.
- LONG-TERM: Develop insurance products for AVs by identifying which vehicles have which features. That will occur naturally as technologies are developed and deployed, participants said.
- LONG-TERM: Avoid different rules across States about the data needed for AV insurance. The Federal government can help by defining necessary data sets and how to access them.

Many participants believe that DOT can help clarify that insurance and liability issues do not represent roadblocks to AV deployment. The Federal role should focus primarily on supporting progress and convening stakeholders to facilitate sharing of accurate, current information so the industry can better deploy and manage its products. There may also be a DOT role in identifying AV safety benefits. States would use that data to approve discounts and incentives for vehicles equipped with AV technologies. The Department is uniquely positioned to support this evolutionary process by allowing insurers to work with States and AV developers, and by convening discussions.

Employment Issues

Feedback from the Roundtables

Improve data and definitions. Better information is needed on how AV deployments may affect the labor force. This includes defining the workers who will be affected by AV deployment, such as drivers, emergency responders, and delivery and service workers, and determining the timeline for anticipated workforce impacts, positive and negative.

Continue to collaborate and coordinate. Increase collaboration and coordination across other Federal agencies, such as with Departments of Labor, Energy, and Education.

Pursue professional capacity building. There is a need for more training and retraining, potentially involving public-private partnerships and community colleges.

Discussion Summary

AVs may have a net positive economic effect, according to several participants, but certain jobs will be particularly impacted as AVs are deployed. These may include retail, manufacturing, construction, maintenance, and driving jobs, such as taxi and freight truck operators. The concern for many is that automation will take away jobs, but participants also expect improved transportation access to create new opportunities:

- With improved mobility, jobs may become available for people with disabilities.
- Data analysts and software developers will play a role in vehicle maintenance.
- There may be job opportunities for people to train and educate AV operators.
- There may be new manufacturing jobs to produce signage, signals, and other infrastructure specific to AVs.
- Construction personnel will be needed to build and maintain the roads and road elements that communicate with vehicles.

Many participants agreed that certain jobs may not necessarily go away entirely, but they will change. Will replacement jobs or new jobs provide comparable pay and benefits as previous jobs? That is an open question.

Some participants pointed out that there is a shortage of drivers in trucking. Automated technology may be an opportunity to mitigate this shortage. Participants said that the average age of a long-haul truck driver is about 50, and wider AV deployment may happen as those drivers reach retirement age. Younger workers are not entering the trucking industry at the rates they used to—natural attrition may alleviate the challenge of drivers losing jobs.

It will be critical to invest in retraining to minimize negative workforce impacts from AV deployment, participants said. Bus and truck drivers will need more technical knowledge in the short term. Participants offered these solutions to improve the transportation workforce's technical knowledge of AVs:

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- Create a Federal grant program for schools to focus on the changing expertise that AVs will demand.
- Develop DOT partnerships with Department of Labor apprenticeship programs.
- Empower the transportation workforce by reframing the role of the operator.
  - A transit operator, for example, who may need to do less operating could receive medical training, or training as a city concierge.

Participants discussed the lack of current and quality data on the impacts AVs will have on the Nation's workforce, and that data is needed to make sound policy decisions. They expressed the need for a timeline of positive and negative workforce impacts, and for common definitions and profiles of workforce participants. A starting point at the Federal level could be DOT-led pilot programs to collect data that can be the basis for developing solutions with workforce stakeholders.

Many participants said they are looking to DOT to provide a state-of-the-industry report, a short-to-mid-term outlook with a bold, multimodal vision for DOT's AV goals. Transportation touches every industry in the country, and automation is going to change many of them. The report could include scenarios for 5- and 40-year outlooks, the amount of fleet penetration needed to start seeing major changes, and studies of different sectors over time to know how they have been and will be affected by AVs. The primary tool that is missing remains an overarching, clear vision on AV deployment.

Cybersecurity

Feedback from the Roundtables

Balance the need for regulation without stifling innovation. Regulations should define performance without mandating technology. Even without regulation, manufacturers and other industry players have significant incentives to keep their vehicles safe. Some industry members expressed concern that if there is too little Federal regulation, States will enact patchwork measures that could impede AV development. A balancing act is required, participants said.

Learn from existing cybersecurity efforts. The Department should learn from best practices from the Federal Aviation Administration and from other Federal agencies, such as the Departments of Defense and Homeland Security, and the National Institute of Standards and Technology. Federal agencies and DOT modal administrations should share training and information, and coordinate to prepare for cybersecurity attacks.

Create a cybersecurity concept of operations, and follow through. Identify system-wide and infrastructure-based cybersecurity needs, threats, and mitigations. Support State and local entities in meeting those needs.

Lead information-sharing efforts. Develop a coordinating organization for blind information sharing and to provide anonymized evaluation of hardware and software, with results shared within the group. Industry generally needs to be able to share data on

cyber vulnerabilities without public disclosure—DOT can help facilitate that sharing and collaborate with industry.

Discussion Summary

Effective cybersecurity starts with industry and consumers, not with prescriptive government regulation, many participants said. AV developers already have a strong business interest in achieving effective cybersecurity, just as they have a strong business interest in occupant safety. Regulations should focus on standards for cybersecurity performance, but should not mandate that particular technologies be used.

Some participants believe that the primary role of government should be to provide advice and guidance, and to stand up demonstration projects. One participant offered the view that the Department should stick to its traditional infrastructure role, and not try to turn the National Highway Traffic Safety Administration (NHTSA) into a cyber-regulator. However, some other participants noted that a patchwork of State regulations would be less desirable than consistently applied Federal regulations.

Participants identified several areas of cybersecurity risk: data security and privacy, communication systems, and the operating environment. Infrastructure is another cybersecurity risk area, though it is often less recognized. Some Infrastructure is old and may not be easily adaptable. The Department has been working on cybersecurity for infrastructure, and should continue to consider cybersecurity risks for infrastructure such as signals, traffic management centers, and vehicle-to-infrastructure communications.

Industry participants said they need to be able to distinguish tiers of cybersecurity risk because some threats are more significant than others—the consequences of an attack on a vehicle control system would be worse than an attack on an infotainment system. But cybersecurity does not need to be a matter of national security. There are many AV cybersecurity risks within private industry, participants said. A freight operator might be able to shut down a competitor's entire fleet without detection, for example.

Some participants pointed out that interdependencies grow as connections grow, and connectivity is essential for system-wide AV operations. Industry needs an anonymous incident reporting method to privately share information, such as means of attack, sensors targeted, and the source of a threat. Such a reporting system might be run by industry, but DOT may have a role in ensuring its effectiveness, and that all relevant players can take part. The Department may also be helpful in performing risk assessment. An example system is the Automotive Information Sharing and Analysis Center is in the automotive industry. Another way to improve AV cybersecurity may be to reduce access points, similar to the approach used in the rail industry. Railroads have private data networks, sometimes in remote areas with limited bandwidth. This framework introduces different challenges, such as interoperability within the larger rail system.

Many participants agreed that it is a question of when, not if, there is a massive cybersecurity attack targeting AVs. A widespread cybersecurity event would severely hamper AV deployment. Such an event would raise particular concerns for law

enforcement. Planning exercises are needed to prepare for and mitigate a large-scale, potentially multimodal cybersecurity attack. A coordinating organization for blind information sharing and anonymized evaluation of hardware and software among AV participants would strengthen the AV industry's and government's ability to respond to cyber threats.

To educate the public and transportation professionals on cybersecurity issues, many participants believe it will be important to convene stakeholders beyond the transportation sector. Federal agencies and DOT modal administrations should share training and information, and should develop coordinated preparation for cybersecurity attacks. State and local agencies need professional capacity building around AV cyber threats and mitigations. The broader public may not be practicing, or be knowledgeable of, good cyber hygiene. For example, some participants believe that many people still use unsecure technologies, do not ensure their connected technologies are regularly updated, and do not use strong passwords.

Many participants said that there is no need to reinvent the wheel when it comes to cybersecurity mitigation—best practices are out there from other industries and modes. The Department can learn from other agencies that have taken steps to address cyber threats. DOT should identify system-wide and infrastructure-based cybersecurity needs, and support State and local entities to help fulfill those needs.

To that end, many participants suggested that the Department create a cybersecurity concept of operations. With leadership from DOT, a concept of operations could serve as a roadmap for cybersecurity mitigation for all modes and at all levels of transportation governance. Developing a concept of operations, and supporting events like hackathons, would represent strong steps toward creating a culture of transparency around incidents, mistakes, and vulnerabilities.

Cybersecurity is not under the purview of a single government agency, according to many participants. All modes need to understand cyber and physical security needs, and start thinking about how security practices in one area affect the broader transportation system: a system-of-systems approach. Moving forward, the dialogue should not be about cybersecurity, per se, but about cyber risk management.

Public Listening Session: Panel Design

Secretary Chao invited the public to DOT Headquarters to hear panelists in industry and government share their perspectives and expertise on the potential benefits and challenges of integrating automated technologies into the Nation's surface transportation system. Moderators facilitated discussions using a question-and-answer format.

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Public Listening Session: Panelist and Moderator Information

This section provides information on panel participants and moderators. Watch the event video[4] for panelists' perspectives on automated vehicles, and for full recorded remarks from Secretary Chao, Under Secretary Kan, and General Counsel Steven Bradbury.

Impacts of Automation on Smart Logistics: From Freight to Front Door

Perspectives from industry leaders on key cross-cutting AV topics

Marjorie Dickman (Moderator)
Associate General Counsel, Global Director, Internet of Things and Automated Driving Policy, Intel Corp.

Shane Karr
Head of External Affairs, Fiat Chrysler Automobiles – North America

Michael Newcomb
Associate Vice President, Transportation Systems Development, Union Pacific Railroad

Chris Spear
President and CEO, American Trucking Associations

AV Policy Best Practices from All Levels of Government

Perspectives from State and local government agencies on best practices regarding the integration of automated technologies into our transportation system

Steven G. Bradbury (Moderator)
General Counsel, U.S. Department of Transportation

Kevin Biesty
Deputy Director for Policy, Arizona Department of Transportation

Melissa Froelich
Chief Counsel, Subcommittee on Digital Commerce and Consumer Protection, Committee on Energy and Commerce, U.S. House of Representatives

Kirk Steudle
Executive Director, Michigan Department of Transportation

Tina Quigley
General Manager, Regional Transportation Commission of Nevada

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[4] https://www.youtube.com/watch?v=HIoeX3C6kdg

Multimodal Executive Panel

Perspectives on AVs from DOT modal agencies

Victoria Hildebrand (Moderator)
Chief Information Officer, U.S. Department of Transportation

Richard Balzano
Deputy Administrator, Maritime Administration

Howard "Skip" Elliott
Administrator, Pipeline and Hazardous Materials Safety Administration

Brandye L. Hendrickson
Acting Administrator, Federal Highway Administration

Heidi R. King
Deputy Administrator, National Highway Traffic Safety Administration

Raymond P. Martinez
Administrator, Federal Motor Carrier Safety Administration

Juan D. Reyes III
Chief Counsel, Federal Railroad Administration

K. Jane Williams
Deputy Administrator, Federal Transit Administration

Appendix A: Summit Agenda

Cross-Cutting Roundtable Breakout Discussions

Thursday, March 1, 2018
8:30 a.m. – 12:00 p.m.
DOT Headquarters Atrium
1200 New Jersey Avenue SE
Washington, DC 20590

7:00 a.m.	Registration Begins	West Building Lobby *New Jersey Avenue Entrance*
8:30 a.m.	Welcome	Finch Fulton *Deputy Assistant Secretary for Transportation Policy, U.S. Department of Transportation*
8:45 a.m.	Opening Remarks	The Honorable Derek Kan *Under Secretary of Transportation Policy, U.S. Department of Transportation*
9:00 a.m.	**Cross-Cutting Breakout Sessions**	1. *Public Safety and First Responders* 2. *Disability and Accessibility Concerns* 3. *Public Education*
10:15 a.m.	**Break**	
10:30 a.m.	**Cross-Cutting Breakout Sessions**	4. *Insurance and Liability* 5. *Employment Issues* 6. *Cybersecurity*
12:00 p.m.	Lunch	DOT Cafeteria

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Public Listening Session on AV Policy

Thursday, March 1, 2018
1:00 – 4:00 p.m.
DOT Headquarters Atrium
1200 New Jersey Avenue SE
Washington, DC 20590

1:00 p.m.	Welcome	Michael Kratsios *Deputy Assistant to the President and Deputy U.S. Chief Technology Officer, White House*
1:10 p.m.	Keynote Address	The Honorable Elaine L. Chao *Secretary of Transportation*
1:20 p.m.	Overview of AV 3.0	The Honorable Derek Kan *Under Secretary of Transportation Policy, U.S. Department of Transportation*
1:40 p.m.	Impacts of Automation on Smart Logistics: From Freight to Front Door *Perspectives from industry leaders on key cross-cutting AV topics*	Marjorie Dickman (Moderator) *Associate General Counsel, Global Director, Internet of Things & Automated Driving Policy, Intel Corporation* The Honorable Shane Karr *Vice President, External Affairs, Fiat Chrysler Automobiles* Michael Newcomb *Associate Vice President, Transportation Systems Development, Union Pacific Railroad* The Honorable Chris Spear *President and CEO, American Trucking Associations*
2:20 p.m.	AV Policy Best Practices from All Levels of Government *Perspectives from State and local government*	The Honorable Steven G. Bradbury (Moderator) *General Counsel, U.S. Department of Transportation* Kevin Biesty *Deputy Director for Policy, Arizona Department of Transportation*

		agencies on best practices regarding the integration of automated technologies into our transportation system	**Melissa Froelich** *Chief Counsel, Subcommittee on Digital Commerce and Consumer Protection, Committee on Energy and Commerce* *U.S. House of Representatives* **Kirk Steudle** *Executive Director, Michigan Department of Transportation* **Tina Quigley** *General Manager, Regional Transportation Commission of Nevada*
3:00 p.m.	**DOT Modal Perspectives**	**Victoria Hildebrand** (Moderator) *Chief Information Officer, U.S. Department of Transportation* **Richard Balzano** *Deputy Administrator, Maritime Administration* **The Honorable Howard "Skip" Elliott** *Administrator, Pipeline and Hazardous Materials Safety Administration* **Brandye L. Hendrickson** *Acting Administrator, Federal Highway Administration* **Heidi R. King** *Deputy Administrator, National Highway Traffic Safety Administration* **The Honorable Raymond P. Martinez** *Administrator, Federal Motor Carrier Safety Administration* **Juan D. Reyes III** *Chief Counsel, Federal Railroad Administration*

		K. Jane Williams *Deputy Administrator, Federal Transit Administration*
3:45 p.m.	**Closing Remarks**	The Honorable Steven G. Bradbury *General Counsel, U.S. Department of Transportation*
4:00 p.m.	**Adjourn**	

Appendix B: Questions for Roundtable Breakout Participants

Public Safety and First Responders

What are some key benefits to first responders that would come from deploying AV technologies?

What potential challenges could AVs pose for first responders?

What actions should DOT take, by itself or through partnerships, to ensure that AV deployment accommodates the needs of first responders and allows them to benefit from AV capabilities?

Disability and Accessibility Concerns

What key requirements must be met for AVs to accommodate a range of users with disabilities?

What are the major challenges to meeting these requirements?

What actions should DOT take, by itself or through partnerships, to overcome challenges and ensure that AV deployment meets the needs of the disabled community?

Consumer and Public Education

What key topics do consumers need to understand to use AV technologies properly and safely?

What are the key challenges in setting consumer expectations?

What actions should DOT take, by itself or through partnerships, to overcome challenges and educate the public on AV technologies?

Insurance and Liability

What are the key insurance and liability issues that may impede the deployment of AV technologies?

What are the key challenges to resolving these issues?

What actions should DOT take, by itself or through partnerships, to address challenges and alleviate insurance and liability concerns?

Employment Issues

What job categories are most likely to be significantly impacted by the deployment of AV technologies?

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What new job opportunities might be created by the deployment of AVs?

What actions should DOT take, by itself or through partnerships, to mitigate impacts on existing workers and facilitate transitions to alternative employment opportunities?

Cybersecurity

What are the key cybersecurity risks posed by AV technologies? How do these risks change as vehicles become fully autonomous?

What are the key challenges in reducing cybersecurity vulnerabilities and mitigating safety risks?

What actions should DOT take, by itself or through partnerships, to reduce the possibilities of successful cybersecurity attacks on AVs, and mitigate the consequences of successful intrusions?

Appendix C: Survey Results

Event Objective

The Department convened its Public Listening Summit on Automated Vehicle Policy on March 1, 2018 at DOT Headquarters in Washington, D.C. There was an invite-only morning stakeholder discussion with 109 participants and an afternoon public listening summit attended in-person or viewed via livestream by more than 800 people, including those present at the morning session.

The purpose of this event was to solicit and understand stakeholder feedback on the development of a DOT AV 3.0 multimodal impacts of automation policy document.

Survey Questions

The day after the event, DOT sent web surveys to all participants. Morning session attendees received a five-question survey about the stakeholder discussion, and a seven-question survey about the afternoon public listening summit. Both in-person participants and livestream participants (who only attended the afternoon session) received the seven-question survey about the listening session.

Some of the questions were coded on a Likert scale (1-5), while others were free text.

Invited Stakeholder Discussion – Morning Session

1. Overall, how would you rate the event? (Likert scale 1-5)
2. What worked well for this event?
3. What did not work well for this event?
4. What could be improved for similar events in the future?
5. What action(s) would you like DOT to take as a follow-up to this event?

Public Listening Summit – Afternoon Session

1. Overall, how would you rate the event? (Likert scale 1-5)
2. How would you rate the quality of the topics? (Likert scale 1-5)
3. How would you rate the quality of the speakers? (Likert scale 1-5)
4. What worked well for this event?
5. What did not work well for this event?
6. What could be improved for similar events in the future?
7. What action(s) would you like DOT to take as a follow-up to this event?

The Participant Experience: Invited Stakeholder Discussion

More than one-third (36 percent) of morning session participants responded to the survey. **Overall, respondents were positive about their experience**, with the vast majority (87 percent) indicating they were "very satisfied" or "somewhat satisfied" with the discussion.

Respondents provided valuable comments on the event's usefulness, citing the **small breakout groups**, **effective facilitators**, and **diverse industry perspectives** as major contributors to their satisfaction. A text analysis of **what worked well** produced the following word cloud:

"Do it again. That workshop appeared to be one where 'all the right people were in the room.' Now, they need to be brought back together to continue/develop conversations further"

———

Audio and Video Logistics Guidance Advance Organized Focused Industry Able Speakers Listening Session Panel Conversation Good Discussion Secretary Interesting Location Government Private Stakeholders

"Smart folks, clear tasks, and great organization."

Respondents offered suggestions for improvement, including securing a **smaller, quieter rooms** for group discussions, and allowing **more time for breakouts**. It was suggested that future events:

- Provide more advance notice so participants can better prepare.
- Assign homework ahead of time so participants have a common foundation of knowledge.
- Use more structured frameworks for discussion rather than open-ended moderated dialogue.

Stakeholder Discussion Next Steps

"Take a leadership role in promoting inclusive and responsible public policy, including convening other agencies in a common cause."

Participants in the morning session are interested in **follow-up discussions** and strongly suggested that DOT host **similar future meetings**. Other suggestions include:

- Share notes or a summary as soon as possible after the event.
- Include the commercial motor carrier and motor coach industries.
- Delve more deeply into implementation details.

The Participant Experience: Public Listening Summit

Responses to the public listening summit survey were low: approximately 15 percent of those who received the survey link provided a response. Still, there was a **broadly positive view of the event** with most (69 percent) respondents "very satisfied" or "somewhat satisfied."

Listening session organizers appeared to have done an excellent job programming speakers and determining discussion topics: **more than three-fourths of respondents** were either "very satisfied" or "somewhat satisfied" with those aspects of the listening summit. Themes related to what worked well included:

- Webcasting enabled a larger group to participate and the technology performed without issue.
- Valuable to have high-level leadership provide a framework for the discussion.
- Useful to have seen the AV 3.0 draft in advance so participants shared the same foundation.

Many respondents provided narrative suggestions and comments about what worked could be improved for future sessions with most comments centering on:

- Poor venue acoustics.
- Lack of back-and-forth and a desire for participants to ask questions and interact with speakers.
- Lost opportunity to provide more detailed and technical information given that many participants were already familiar with the basics.

Public Listening Summit Next Steps

Participants in the afternoon session are interested in **follow-up discussions** and strongly suggested that DOT host **future meetings**. Other suggestions include:

"I think it would be very valuable to hear from session attendees, allowing them to ask questions."

- Incorporate Q&A and dialogue between participants and speakers to the extent practical.
- Host the meeting in a smaller venue with better acoustics.
- Focus on more specific topics.

Appendix D: Media Coverage

Insurance Journal: U.S. Wants Public Input on Rules for Driverless Vehicles, Trains

https://www.insurancejournal.com/news/national/2018/03/02/482211.htm

Land Line Magazine: U.S. USDOT autonomous vehicle policy summit addresses trucks

http://www.landlinemag.com/story.aspx?storyid=71853#.Wp7IPFWnGUk

Manufacturing.Net: USDOT Plans to Evaluate Outcomes, Not Technology, in Self-Driving Vehicles

https://www.manufacturing.net/news/2018/03/dot-plans-evaluate-outcomes-not-technology-self-driving-vehicles

Reuters: U.S. regulators seek public views on self-driving trucks and trains

https://www.reuters.com/article/us-autos-selfdriving/u-s-regulators-seek-public-views-on-self-driving-trucks-and-trains-idUSKCN1GD6C7

Smart Cities Dive: Stakeholders convene for USUSDOT public hearing on AV policy

https://www.smartcitiesdive.com/news/usdot-public-hearing-autonomous-vehicle-policy-stakeholders/518232/

The Verge: Self-driving cars continue to face little resistance from the Federal government

https://www.theverge.com/2018/3/5/17080824/dot-autonomous-vehicle-listening-session-washington

Transport Topics: Chao Tells Automated Vehicle Summit USDOT "3.0" Guidance Could Be Issued in Early Summer

http://www.ttnews.com/articles/chao-tells-automated-vehicle-summit-dot-30-guidance-could-be-issued-early-summer

Washington Examiner: Elaine Chao: Preparing for the future of automated transportation

http://www.washingtonexaminer.com/elaine-chao-preparing-for-the-future-of-automated-transportation/article/2650396

Washington Post: 'We're listening,' Department of Transportation says on the future of driverless cars

https://www.washingtonpost.com/local/trafficandcommuting/were-listening-department-of-transportation-says-on-the-future-of-driverless-cars/2018/03/01/8992682a-1d72-11e8-b2d9-08e748f892c0_story.html?utm_term=.8ec35f766f7b

Appendix E: Terms and Concepts

ADA: Americans with Disabilities Act.

AV developer: A company that produces automated vehicles for one or more surface transportation modes.

AV integration: Safely deploying AVs as part of the Nation's transportation network.

AVs: Automated vehicles.

Chatham House Rule: Roundtable breakout sessions used the Chatham House Rule[5]: "Participants are free to use the information received, but neither the identity nor the affiliation of the speaker(s), nor that of any other participant, may be revealed."

FMVSS: Federal Motor Vehicle Safety Standards. NHTSA issues these standards to implement laws from Congress. Manufacturers of motor vehicles and motor vehicle equipment must conform and certify compliance with these regulations.

Full automation: Level 5 automation, at which a human has no role operating a vehicle.

Levels of automation: There are six levels of vehicle automation[6], developed by SAE International, which NHTSA adopted in 2016. At levels 0 to 2, the human monitors the driving environment. At levels 3 to 5, an automated driving system monitors the driving environment.

- **Level 0:** No automation.
- **Level 1:** Driver assistance.
- **Level 2:** Partial automation.
- **Level 3:** Conditional automation.
- **Level 4:** High automation.
- **Level 5:** Full automation.

V2V: Vehicle-to-vehicle. The wireless exchange of data among vehicles in the same area.

V2I: Vehicle-to-infrastructure. Technologies that capture vehicle-generated data, wirelessly providing information such as traffic, safety, or mobility advisories from roadside infrastructure to a vehicle or vehicles.

VMTs: Vehicle miles traveled is the total miles traveled by all vehicles during a defined time period, typically annual.

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[5] https://www.chathamhouse.org/about/chatham-house-rule
[6] http://articles.sae.org/15021/

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1200 New Jersey Ave. SE
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