



MEETING SUMMARY

Meeting: Executive Committee, Meeting #11

Location: Virtual Meeting only

Date: October 5, 2021

Members in Attendance:

Member*	Organization	Present (Y/N)	Rep Sent in Place (Y/N)
James A. Restucci (Chair)	Washington State Transportation Commission	Y	--
Shiv Batra (Vice Chair)	Washington State Transportation Commission	Y	--
Senator Curtis King	Washington State Legislature	N	N
Senator Ann Rivers	Washington State Legislature	N	N
Senator Joe Nguyen	Washington State Legislature	N	N
Senator Mona Das	Washington State Legislature	N	N
Rep Sharon Shewmake	Washington State Legislature	Y	--
Rep Shelley Kloba	Washington State Legislature	Y	--
Rep Mary Dye	Washington State Legislature	N	N
Rep Matt Boehnke	Washington State Legislature	N	N
John Batiste	State Patrol	N	Y – Dennis Bosman
Shelly Baldwin	State Traffic Safety Commission	Y	--
Mike Kreidler	State Insurance Commission	N	N
Teresa Bertsen	Department of Licensing	N	Y – Beau Perschbacher; Jill Johnson
Roger Millar	Department of Transportation	Y	Y – Daniela Bremmer
Joel Sacks	Department of Labor & Industries	N	N
Laura Johnson	Department of Health	Y	--
Cami Feek	Employment Security Department	N	Y – Phil Castle
Bill Kehoe	State Chief Information Office, WaTech	Y	--
Debbie Driver	Governor's Office	N	N
Dr. Yin Hai Wang	Smart Transportation Applications & Research Laboratory (STAR Lab), University of Washington	Y	--
Justin Leighton	Washington State Transit Association	Y	--
Tom Alberg	ACES Northwest	N	N
Sam Zimbabwe	City of Seattle Transportation Department	N	Y – Kelly Rula
Curt Augustine	Alliance for Automotive Innovation	Y	--
Brenda Wiest	Teamsters Local 117	N	N
Todd O'Brien	Adams County	Y	--
Jessica Ramirez	Puget Sound Sage	N	N
Bryan Mistele	INRIX	Y	--
John Milbrath	AAA	Y	--
Bryce Yadon	Futurewise	Y	--
Ariel Wolf	Self-Driving Coalition for Safer Streets	Y	--
Steve Gordon	Gordon Truck Centers	N	N
Anna Zivarts	Disability Rights Washington	Y	--
Annabel Chang	Waymo	Y	--

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A full recording of the virtual meeting and meeting materials are available on the WA AV Work Group website:

Meeting agenda and presentation materials: <https://avworkgroupwa.org/committee-meeting/executive-committee-meeting-11>

Meeting session recording: <https://youtu.be/0k8A-qG3QVY>

Questions and responses during presentations can be found in the Presentation Questions Log table at the end of this document.

WELCOME AND INTRODUCTIONS

Jim Restucci, Chair of the AV Work Group, opened the meeting with introductions of Executive Committee members, an overview of the meeting agenda, and a walk through of virtual meeting operations and functionality.

MINNESOTA CONNECTED AND AUTOMATED VEHICLES (CAV) CHALLENGE

Tara Olds, Deputy Director, CAV-X Program, Minnesota Department of Transportation

Tara Olds, Deputy Director for the CAV-X Program at the Minnesota Department of Transportation, provided an overview of the Minnesota CAV Challenge, and how “Minnovation” inspired value-based partnerships.

Ms. Olds discussed the background for the program, which launched in 2018 and has since won awards for its innovative approach. The program is an open and rolling request for proposals that allows for a wide variety of CAV solutions, working collaboratively with the industry, holding pre-bid brainstorming sessions to refine potential concepts to ensure they meet the goals of the program. Ms. Olds noted key reasons to use this type of approach is when the goals or requirements are hard to define and/or rapidly changing, as is the case in the CAV space.

The CAV Challenge has held 103 vendor meetings, had 69 proposals submitted, and has awarded 16 projects, including:

- Fiber optic study and partnership with traffic, opportunity (cameras, sensors, etc.), and commercial layers to evaluate and prioritize corridor investments
- Autonomous maintenance using self-driving trucks with crash cushions to protect workers
- Connected vehicle corridors using smartphone and in-vehicle technologies to warn drivers and avoid collisions
- Traveler Info technology

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- Level 4 automated shuttles on an urban route to test technology, conduct research, and demonstrate automated, self-driving vehicles to residents, business, and visitors

Ms. Olds concluded with several lessons learned through the CAV Challenge, including equity, prioritization, human-centered design, IP and trade secret protection, performance measures and accountability, seeking feedback, and managing expectations.

AV PILOT CONSIDERATIONS

Scott Shogan, Vice President, *WSP USA*

Scott Shogan, Vice President for WSP USA, presented a comparison of various AV pilot approaches and held a discussion with the Executive Committee on goals for a potential pilot in Washington.

Mr. Shogan referenced Executive Committee feedback from the May 25th Work Group meeting on the Committee's interest in bringing AV testing to the state, and the primary objectives for AV testing in Washington – the top three of which were informing policy-making, improving public awareness, and enhancing organizational knowledge. Mr. Shogan discussed the different types of pilot approaches that could be taken in Washington, focusing on two key approaches – a defined pilot and a grant-like program (open, rolling requests for proposals). These pilot approaches differ in how they balance public vs. private ownership and control, cost and risk sharing, the level of scope defined, the contracting approach, and how objectives are approached and achieved.

Mr. Shogan then addressed the need to establish goals for a pilot, which can guide the type of pilot and approach to pursue, expectations for both the public and private sector, and how the pilot aligns with other related or competing goals, such as state environmental goals. Mr. Shogan led the Executive Committee through a polling exercise to identify potential priorities in terms of goals for a potential AV pilot in Washington State, focusing on informing policy-making, improving public awareness, and enhancing organizational knowledge.

- **Informing Policy-Making Goals:** Better understanding of infrastructure needs to support deployment rose to the top, with validating and/or identifying gaps in the existing regulatory framework second, and testing out policy for identification of testing location a close third.
- **Public Awareness and Exposure:** Increasing public understanding of AV technology capabilities was identified as the top priority, closely followed by educating the public on safe use of AV technology.
- **Enhancing Organizational Knowledge:** Better understanding agency roles and responsibilities for AV deployment and operation rose to the top, with better understanding necessary inter-agency and private sector partnership needs close behind.

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Mr. Shogan then polled the Executive Committee on, if Washington State pursued and funded a pilot program, what is the preferred pilot approach. A “hybrid” approach – leveraging key components from both the prescribed pilot and open/rolling approaches – was the clear preferred approach among members in attendance. Some Executive Committee members noted that they were desirous for a third option for not publicly funding a pilot at all or diverting limited funds away from other projects to fund an AV pilot; this option was not presented due to the strong indication during previous meetings to pursue and fund a pilot in the state.

MICHIGAN CONNECTED AND AUTOMATED VEHICLES (CAV) CORRIDOR

Mark de la Vergne, VP Project Development, *Cavnue*

Mark de la Vergne, VP of Project Development for Cavnue, provided an overview of the first-of-its-kind connected corridor in Michigan, bringing together technology and infrastructure to create a connected corridor improving safety, congestion, accessibility, and other benefits for the state.

Cavnue is providing master services to Michigan Department of Transportation (MDOT) and its partners to conduct a feasibility analysis for a CAV corridor from Detroit to Ann Arbor. Cavnue is fully funding the project, with zero dollars committed by MDOT. The project is seeking to convert an existing travel lane into a mixed-use lane for both CAVs and non-CAVs. The project will not add lanes or remove any capacity. The project is looking at both transit and personal vehicle use cases, commercial use cases are currently not the main focus of the project.

Mr. de la Vergne also discussed stakeholder engagement in the project, including local and academic partners as well as engagement from the industry. The project is also coordinating with the Federal Highway Administration on some non-traditional pieces of the project, including infrastructure design exceptions and potential methods to ultimately fund the entire project.

AV WORK GROUP ROADMAP TO THE FUTURE DEVELOPMENT UPDATE

Scott Shogan, Vice President, *WSP USA*

Scott Shogan, Vice President for WSP USA, provided background on the “Roadmap to the Future”, a legacy deliverable for the Work Group to provide to law makers at the sunset of the Work Group at the end of 2023, laying out a plan for the future and how Washington can prepare for AVs. To support the development of this legacy deliverable, Mr. Shogan presented the idea of framing the Roadmap around tangible use cases potential for testing and deployments in Washington State, to help put the Roadmap’s content in context.



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Mr. Shogan discussed several potential use cases to help frame the Roadmap, outlined in the table below:

USE CASE	DESCRIPTION	AUTOMATION LEVEL/ OPERATING CONTEXT	CURRENT VEHICLE/ TECHNOLOGY BRAND EXAMPLES	MARKET READINESS
Passenger Vehicle ADAS	Advanced driver assist systems offering hands-free freeway driving with automated speed and lateral control, and other advanced automated navigation features.	L2/L3; Urban and rural freeway, limited urban arterial roadway	Tesla Autopilot, GM SuperCruise	Commercially available
Truck Platooning	Automated truck functionality allowing a trailing truck (with or without safety operator) to follow a lead truck at close distance.	L3/L4; Rural freeway	Locamation, Peloton,	Current pilots and demonstrations
Automated Ride Hailing	Automated passenger vehicle (with or without a safety operator) serving as a taxi for a passenger trip within defined geographic limits.	L4; Urban roadways	Waymo, Amazon Zoox, Cruise	Current pilots and demonstrations
Last-Mile Goods Delivery	Vehicles of various form factors providing good delivery to end-customer without a human occupant in the vehicle.	L4; Urban (generally low-speed) roadways and sidewalks	Nuro, Kiwibot	Current pilots and demonstrations
Transit	Automated bus functionality, including platooning and precision station platform docking. Operation primarily in dedicated lanes/guideways or bus yards.	L3/L4; Urban roadways	New Flyer/Robotic Research	Current pilots and demonstrations

Mr. Shogan then polled the Executive Committee on the use cases, and how relevant each use case was to provide context for the Roadmap and to support Washington’s AV readiness. Executive Committee membership showed interest in all of the use cases to some degree, with no use case being an obvious front runner or one to remove from the discussion altogether. Members were also asked if there are other use cases they believed were relevant but were not called out. Members provided use cases and other issues they would like to see incorporated, including personal use AVs, pedestrian safety, personal delivery devices, infrastructure and intelligent highways, equitable application of AV technology, testing and safety standards,

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affordability and accessibility for disabled non-drivers, commercial applications and deadheading, and AV applications within ports.

Mr. Shogan wrapped up the polling exercise asking members which of the identified use cases would be the highest priority for an AV pilot in Washington, with automated ridehailing rising to the top, however there was general interest across the use cases. The Executive Committee held a discussion around the use cases with key topics of discussion including:

- The applicability of Advanced Driver Assist Systems (ADAS) to the purview of this Work Group.
 - ADAS is not AV and is already commercially available, on the roads today, not necessarily something this Work Group would pursue action to prepare for. Concern that if ADAS is included, may cause confusion.
 - There is a conflation of ADAS and AV, especially in the public eye, which may warrant the Work Group to take action to acknowledge the differences, supporting public awareness and education efforts.
 - Lessons learned from ADAS and the considerations and improvements needed for ADAS can also be helpful for AVs.
- Narrowness of Truck Platooning as a use case, rather than a broader Freight use case
 - Truck Platooning is Level 2 automation, which may be out of the purview of this Work Group as it is already commercially available and would not require further regulation. Concern this could conflate truck platooning and ADAS-related technologies with higher automation and AV deployments.
 - All heavy-duty autonomous trucking does not fall into this category, this is just one type of truck automated functionality, just focusing on truck platooning may limit the autonomous trucking conversation.
- Recommendation to more clearly articulate the differences between ‘ride hail’ type AVs being used for automated transit designed for multiple riders, rather than automated ride hailing that are focused on individual vehicle at the beck and call for individual or smaller shared rides.

AV SUBCOMMITTEE UPDATES AND RECOMMENDATIONS

Licensing Subcommittee – Beau Perschbacher, Co-Chair

The Licensing Subcommittee has only met once in 2021, after the legislative session wrapped up. The subcommittee provided feedback and information on the SSB5460 that passed this year, and heard feedback from industry representatives on concerns around reporting and notifications covered in the bill. We also heard from the Self-Driving Coalition their feedback on the bill as well as their insights for testing and deployments in Washington State. The committee plans to continue working with the industry on their concerns in SSB5460 in preparation for the next legislative session.

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Safety Subcommittee – Captain Dennis Bosman and Manuela Papadopoul, Co-Chairs

Captain Dennis Bosman recently joined the Safety Subcommittee as the public co-chair. The Safety Subcommittee has met several times through 2021, continuing efforts to bring recommendations regarding safety, focusing on bringing together legislators, automotive industry such as Waymo and the World Economic Forum, positioning Washington State to join California and Arizona in playing an important role in developing AV regulation and comprehensive standards.

Liability Subcommittee – David Forte, Co-Chair

The Liability Subcommittee has held 4 meetings in 2021, and has heard from the American Property Casualty Insurance Association, State Farm and PEMCO insurance companies, the federal legislative advisor to the National Association of Insurance Commissioners, and an advanced mobility systems planner from WSP USA. The subcommittee looked at the upcoming shift in the paradigm for auto insurers for assigning risk, the shift to a more commercial ownership system, data access and affordability in related to liability assignment, definition of driver and operator being updated across the states, federal activities for autonomous vehicle legislation and reduction in bi-partisan support, and the market shift to more product liability arrangements and how it affects consumers.

The subcommittee plans to develop damage scenarios for internal discussion, walking through application of a few ideas that affect assignment of liability, and plan to provide results to the Executive Committee in 2022.

Health and Equity Subcommittee – Dr. Andrew Dannenberg, Chair

The Health & Equity Subcommittee has not met in 2021. The most important role the Health & Equity Subcommittee can serve is to review recommendations that come out of other subcommittees from a health and equity point of view. The subcommittee requests that subcommittees provide recommendations with some time between when they are generated and when they are put into the review and approval process with the Work Group as a whole.

Some members in the subcommittee are looking into issues and potential recommendations related specifically to impacts to road users with disabilities, such as how someone in a wheelchair uses an AV.

Dr. Dannenberg is also working with two students at the University of Washington, looking at the health and equity issues related to AVs on a broader scale, looking at literature, discussing with other states and researchers, and identifying a list of major equity issues and appropriate policies to address them. One issue Dr. Dannenberg noted during the meeting was that of safety and security of riders in a shared AV scenario, particularly of women who may not be comfortable getting in to a shared AV with a stranger and no driver/operator present, and what technologies could be present to make the experience feel safer and more comfortable, such as a panic button.

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Workforce Subcommittee – Allison Drake, Co-Chair

The Workforce Subcommittee has only met once, in late 2019. The pandemic presented us with many challenges, including the need for the agencies that support this work group – employment security department and department of labor and industries – to respond to the crisis and the work needed to support the state during the pandemic. This has impacted the capacity to support the Workforce Subcommittee. The co-chairs of the subcommittee have committed to doing a deeper dive into the potential workforce related issues that this subcommittee may tackle – worker safety, rights, retraining, displacement, impacts of automation across various industries, etc. Co-chairs continue to meet to identify potential efforts the subcommittee should undertake, and are planning for an upcoming subcommittee meeting, tentatively scheduled for October 19th.

System Technology & Data Security Subcommittee – Zach Hudgins, Co-Chair

Katy Ruckle has rotated out as public co-chair for the System Technology & Data Security Subcommittee, with Zack Hudgins with WaTech stepping in as public co-chair. The subcommittee is coordinating an upcoming subcommittee meeting.

The subcommittee has met multiple times during 2021, including discussions around the UL4600 standard. There was no clear recommendation or consensus that came out of the UL4600 discussions, they were robust discussions and resulted in letters being sent to the Work Group from those that oppose those standards and from individuals that helped to draft those standards.

AV INDUSTRY PANEL

Industry representatives shared their insights and experiences testing in other states and offer input into Washington State's AV regulatory framework.

Questions and presenter responses can be found in the Presentation Questions Log table at the end of this document.

Motional – Nick Greif, Senior Manager, Public Policy & Sam Wempe, Director, Government Relations and Public Policy

Sam Wempe, Director of Government Relations and Public Policy for Motional, provided an overview of Motional, an autonomous vehicle developer focused on making driverless vehicles a safe, reliable, and accessible reality. Motional focuses on fleets rather than individually owned autonomous vehicles. Mr. Wempe provided information on Motional's technical heritage, footprint, and drive for working in driverless technology.

Nick Greif, Senior Manager of Public Policy for Motional, then presented on Motional's next generation robotaxi, an all-electric Hyundai IONIQ 5, launching a fully-driverless robotaxi service in 2023. Motional also operates a fleet of over 100 vehicles in its Las Vegas Technical Center in

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partnership with Lyft to provide ridehailing services, which enables low costs for the customer and high number of rides per hour for the vehicle. Riders partaking in the Motional-Lyft AV network in LAS Vegas can provide feedback to support improvement of the technology and experience. Motional's path to deployment is to thoroughly test, through mapping, testing with and then without a driver, passenger user experience testing, and finally to commercial launch, with constant refinement throughout the process.

Mr. Greif also discussed Motional's approach to safety. Motional has an up-to-date voluntary safety self-assessment, and had an independent 18-month long safety audit conducted by TUV SUD¹ for its Las Vegas operations. Motional supports public research into computer vision and autonomous driving, and publishes image and lidar scan datasets made publicly available, and serves as a benchmark for autonomous vehicle planning.

Designated Driver – *Manuela Papadopol, CEO*

Manuela Papadopol, CEO of Designated Driver, presented an overview of the company and debunked myths about teleoperations. Designated Driver is a teleoperations provider for autonomous vehicles, providing remote-control capabilities if/when the vehicle operations needs to be taken over by a human and there is no human driver in the vehicle.

Ms. Papadopol then debunked six myths about teleoperations:

- Myth #1: Teleops *is* remote driving.
 - Fact: Teleops means monitor, assist, and drive.
There is not a business model for a one-to-one vehicle to remote driver.
Teleoperations provides fleet integration and monitoring services, assistance while the autonomous system remains in control, and can take over and drive the vehicle if/when the autonomy system fails or needs direct assistance.
- Myth #2: AV systems do not need teleops.
 - Fact: Teleops is the safety net of AV.
Sensors fail, autonomy systems are still in development. Teleops provides that human support, monitoring the fleet, assisting it, or simply driving.
- Myth #3: Low latency is critical for teleops.
 - Fact: Low latency is critical for *remote driving*.
Low latency is not critical for monitoring and assisting. To provide remote driving for an autonomy system that failed, low latency is needed to support the service and provide that critical layer of safety.
- Myth #4: 5G is a must for teleops.
 - Fact: 5G unleashes new opportunities.
5G adds robust layers of reliability and responsiveness for more complex situations, especially in private network environments. It can enable more

¹ TUV SUD independent safety audit of Motional driverless test operation of a subset fleet of robotaxis on public roads in Las Vegas, NV: <https://www.tuvsud.com/en-us/press-and-media/2021/april/tuev-sued-av-permit-for-motional>

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complex and data-heavy services, and faster over-the-air updates for new services.

- Myth #5: Teleops is just for robotaxis and shuttles.
 - Fact: Teleops brings value to any vehicle and any situation. We are working with other industries, such as agriculture, airports, warehouses. We are seeing autonomy grow rapidly in other areas such as sidewalk delivery robots, goods delivery, distribution of supplies in environments you cannot send a human in such as wildfires or medical institutions. The concept of teleoperations is applicable to a wide variety of vehicles, from shuttles and robotaxis to sidewalk passengers or agriculture and warehouse robots.
- Myth #6: If you master racing video games, you can be a teleoperator.
 - Fact: Teleoperators are not gamers having fun. Driving is a complex task and requires a variety of skills, such as physical and cognitive behavior, and sensory perception abilities. People working in autonomous technologies are intelligent people working in complex environments.

NHTSA NATIONAL AV UPDATE

Dr. Steven Cliff, Acting Administrator, National Highway Traffic Safety Administration (NHTSA)

Dr. Steven Cliff, Acting Administrator of NHTSA joined to share some remarks on behalf of the agency. Dr. Cliff started off by sharing that over the next four years, the agency will work to improve safety for all road users including drivers, passengers, pedestrians, bicyclists, children, older Americans, and people with disabilities. He noted the agency is advocating for a safe systems approach that is people-focused and supports “The Five E’s”: equity, engineering, education, enforcement, and emergency medical services.

NHTSA recognizes that automated driving systems (ADS) are mostly in the testing and development stages, and restricted to operations in more simplified domains. NHTSA believes cautious and responsible progress is the right tempo for their development. At maturity, ADS may offer opportunities and positive impacts to safety, equity, accessibility, air pollution, and reduce traffic congestion. In those areas where we have concerns, we must collectively build possible solutions now, such as privacy concerns for mobility-as-a-service, cybersecurity, and information gathered by camera monitoring and location information.

Dr. Cliff also spoke to the recent NHTSA standing order requiring the reporting of crash data of specific ADS and level 2 ADAS vehicles, noting that this information will help NHTSA identify defect trends. After concluding his remarks, Dr. Cliff participated in a Q&A session with Chair Restucci.

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Q: Do you see the USDOT establishing a national vision and instituting a stronger regulatory posture for AVs in America?

A: The way we're approaching this is to allow innovation to occur but to make sure we're understanding the potential safety impacts of this new technology. Many people don't realize that NHTSA doesn't actually certify vehicles for operation, so our responsibility is to continue to evaluate technology as manufacturers and operators continue to innovate. Many of the local jurisdictions are then responsible for permitting or allowing these vehicles on the road. In the case of the ADS, we're focused on the protection of occupants and ensuring the safety of vulnerable road users, as well as how this technology can improve safety or ultimately benefit society. We're also interested in how we can use this technology to advance equity and accessibility. It's important for all of you operating in this space to think about the challenges we're facing in transportation today and how some of these systems can advance or make good on some of the promises that are important to your stakeholders.

Q: What are the key research priorities for the USDOT in the CAV space over the next few years?

A: We're looking at crash protection, at cyber security issues, at crash avoidance and crash worthiness, and specific aspects of the technology. We're also examining the data being collected from our standing order to understand what sorts of issues are arising and to the extent that we can identify defects, doing more research on those. We're also doing a lot of behavioral work to understand the interface between human and machine. In the case of ADAS, where you have a human that is supposed to be engaged in the driving task, you want to be sure you understand what those considerations are and as you increase the level of automation, how you maintain engagement from the human driver to ensure that safety is still first and foremost.

Q: In Washington state, we've been wrestling how best to attract more testing and eventual AV deployment. What advice or suggestions would you offer?

A: What I offer is to look at what problems you're trying to solve in transportation. We know transportation is responsible for the majority of climate-related emissions, so that's an issue that can be addressed thinking about how you can use the technology to reduce your impact on the environment. If accessibility is an issue you're concerned about, how would AV systems advance accessibility, how do they help get mobilize populations that otherwise don't have access to destinations? Once you identify these sorts of issues, you'll attract solutions by tech providers and those in this space to help address the issues you've identified.

Q: Does NHTSA intend to update or build upon AV 4.0?

A: It is helpful to state first that the naming scheme for this guidance is not that one supersedes the previous, but rather they specifically address certain areas in this space and build on each

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other. 2.0 was a NHTSA-led effort that specifically address automated driving safety, AV 3.0 was looking more multimodal throughout USDOT, and 4.0 was looking at the landscape from a whole of government approach. We are thinking broadly about the areas we need to continue to address, and if there are gaps in the current reports, that we are addressing those. To address most of the gaps at this point, we need better data, which is part of our research and information collection programs are all about, and the standing general order previously mentioned is all about to get more information and build upon our learnings.

Q: There is a lot of confusion when it comes to driverless, self-driving, autonomous terms – and the SAE levels of automation. The USDOT often talks about ADAS and ADS as the two primary approaches to automation, do you believe there is a simpler way to describe it for the general public?

A: We have adopted the SAE levels of driving automation as our key to thinking about these technologies. Generally speaking, we think about the ADS as those that do not require a human driver for much of the driving task – that is level 3, 4, and 5 autonomy. ADAS are levels zero, 1, and 2. The best of the ADAS-type systems may start to blur the line between that which requires a human driver and that which is fully autonomous. More important than these terms and acronyms is to be clear and consistent with the discussion. NHTSA tries to be very clear separating out the difference between ADAS and full autonomy. The standing general order is a good example, there are separate requirements for ADAS and ADS.

Q: In 2016 the Obama administration proposed a rulemaking (FMVSS 150) that would mandate connected vehicle communications – but in 2017 the Trump Administration put it on the back burner. Do you see the Biden administration resurrecting that proposed rulemaking, and updating it with current technology trends?

A: FMVSS rule 150 is still on the long-term agenda. A lot has changed in the last several years in terms of the spectrum that is available for communications, and there is still a lot of ongoing work there. There are some significant advantages to vehicle-to-vehicle communications, and we want to leverage those advantages. We understand there is new work that needs to be done, it is important to understand that vehicle-to-vehicle communication is not necessarily required for technology to continue to advance. We want to let technology advance, and at the same time continue to do research and to better understand, given the landscape today and the policy on the communications spectrum, what we can actually continue to do. Any rulemaking would have to take into consideration all of those things.

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EXECUTIVE COMMITTEE MEMBER ITEMS

Open forum

Executive Committee members in attendance were given the opportunity to offer thoughts, insights, and observations.

- Ariel Wolf with Self-Driving Coalition for Safer Streets brought up further discussion on the distinction between ADAS and ADS.
 - It is a safety issue – when consumers does not understand that ADAS technology is *not* AV, there are life and death situations.
 - If the public associates AV technology with ADAS and the related safety issues being published today (e.g. misuse of ADAS that leads to fatalities), it drives down acceptance of AV technologies.
 - This Work Group should be mindful to not be in search of a mission. There are a lot of great topics out there to discuss, but they are not necessarily AV topics, and we should focus on the purview of this Work Group.
 - Curt Augustine with the Association for Automotive Innovators noted the association and the automakers it represents share these concerns that the conflation of AV (or ADS) and ADAS is problematic.
 - Beau Perschbacher with the Department of Licensing asked if, from a regulatory perspective, the recently passed bill helps define AVs as level 4 and 5 in terms of the self-certification process.
 - Self-Driving Coalition responded that yes, the legislative language was helpful, however the ADAS/AV issue is broader as the public and work groups such as this if they continue to be conflated.
- Representative Shelley Kloba noted she is working on a follow-up bill to 2020 House Bill 2676 that established the minimum requirements and regulation for AV testing, and the 2021 Senate Bill 5460 that delayed some of the implementation deadlines so we could have more time to work on it, and welcomes opportunities to have conversations with any of stakeholders looking to engage in that development.

GHSA REPORT: LAW ENFORCEMENT, FIRST RESPONDER, AND CRASH INVESTIGATION PREPARATION FOR AUTOMATED VEHICLE TECHNOLOGY

Tammy Trimble, Senior Research Associate, *Virginia Tech Transportation Institute*

Tammy Trimble, Senior Research Associate for the Virginia Tech Transportation Institute, presented on GHSA's recently published report examining how law enforcement, first responders, and crash scene investigators can better prepare for automated vehicle technology. The objectives of this effort was to distill and summarize strategies for integrating ADS-equipped

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vehicles into the US fleet without significant disruption to protocols of public safety, and to develop proposed curricula to provide a knowledge base for ADAS and ADS deployment for law enforcement, first responders, and crash investigators.

The curricula considered why training is needed, where, when, and how training should be provided, and what the actual training being provided should contain. The curricula highlighted the need to differentiate ADAS and AV, understanding governmental responsibilities, interacting with ADS-equipped vehicles, and understanding and accessing data.

Ms. Trimble also acknowledged some barriers to effective training, as well as opportunities moving forward. A full copy of the published report can be found at:

<https://www.ghsa.org/resources/Preparation-for-Automated-Vehicle-Technology21>

CLOSING REMARKS

Chair Jim Restucci thanked the presenters, organizers, and Executive Committee members, and asked if there was any other business to come before the committee. No other business identified.

MEETING ADJOURNED.

Important Dates:

- **October 19-20, 2021** – Transportation Commission Meeting (*AV Work Group 2021 Annual Report preview October 20t*)
- **November 15, 2021** – AV Work Group 2021 Annual Report due to the Governor and Legislature



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PRESENTATION QUESTIONS LOG

Presentation	Participant	Question / Comment	Presenter Response
Minnesota Connected and Automated Vehicles (CAV) Challenge	Justin Leighton	Is the CAV Challenge publicly funded or a public private partnership? How much public funding is allocated to this program?	The CAV Challenge is 100% state funded but our projects often bring in other funding from public and private entities as well. We allocate \$2.5 million a year for the program.
AV Pilot Considerations	Annabel Chang		Waymo SDC Justin response Kloba response Waymo response
Michigan Connected and Automated Vehicles (CAV) Corridor	Justin Leighton	Is the current lane that is being converted a standard single occupancy vehicle (SOV) lane or a high occupancy vehicle (HOV) lane?	The lane being converted is a SOV lane. Michigan does not have HOV, high occupancy tolling (HOT), or toll lanes in the state – this will be first managed lane.



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Michigan Connected and Automated Vehicles (CAV) Corridor	Representative Shelley Kloba	In terms of addressing disengagements, is there value in measuring the frequency, and types of disengagements so you can sense whether various strategies you are proposing will decrease the amount of disengagements?	We are working closely with companies on the advisory committee to know if what we are building works for them. We have talked with folks working on level 2 and level 4 automation, looking to them for their experience, and insights as to whether this solution helps.
Michigan Connected and Automated Vehicles (CAV) Corridor	Representative Shelley Kloba	Are the companies themselves monitoring disengagements?	<i>Presenter stated they are not at liberty to say due to non-disclosure agreements in place.</i>
Michigan Connected and Automated Vehicles (CAV) Corridor	Justin Leighton	Have you received public feedback from everyday drivers seeing a lane taken away for this effort?	To date, outreach has only been done with staff and officials in participating communities. We are planning to go out for public outreach in the near-term. The lane will not be only for vehicles with enabled technology, it will be open to everyone so all vehicles can use the lane. Technology-related benefits will only go to those vehicles that have technology enabled.
AV Work Group Roadmap to the Future Development Update	Justin Leighton	How much does the robot bus (automated transit) cost?	Unsure. This technology is very early, pilot vehicles, not a widely commercially available type of vehicle yet.



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Presentation	Participant	Question / Comment	Presenter Response
AV Work Group <i>Roadmap to the Future</i> Development Update	Manuela Papadopol	Aerial devices – Where would those fit into this planning?	The legislation that enables this Work Group contemplates surface transportation only, and during conversations with legislative staff the interpretation was that the intent of the law was to focus on surface transportation, not on air.
AV Work Group <i>Roadmap to the Future</i> Development Update	Representative Shelley Kloba	Recommend it is articulated more clearly the differences between ‘ride hail’ type AVs being used for automated transit designed for multiple riders, rather than automated ride hailing that are focused on individual vehicle at the beck and call for individual or smaller shared rides.	
AV Work Group <i>Roadmap to the Future</i> Development Update	Bryan Mistele	Earlier discussion around removing Passenger Vehicle ADAS as a use case, but there is no Passenger Vehicle AV use case presented as an option. Can we expand the definition to Passenger Vehicle AVs?	In presenting the Passenger Vehicle ADAS use case, we were particularly trying to call out passenger vehicles <i>short of</i> high automation (AV). We were looking to get at the conflation of these two things and the misuse of ADAS and whether this Work Group needed to address that. In relation to the earlier discussion, and the earlier comment about separating automated ride hailing for individuals vs. transit, there may be a separate use case to be identified specific to passenger vehicle / personal use AVs.



MEETING SUMMARY

Presentation	Participant	Question / Comment	Presenter Response
AV Industry Panel – Motional	Representative Shelley Kloba	How did you know your vehicle was ready to move from operations with a driver to operations without a human driver? Were there certain benchmarks or criteria?	We took extraordinary steps before going driverless for the first time. We have an internal validation process – happy to get folks from Motional’s safety team who can dive into that on a more technical level – which runs from a mass amount of testing in a simulated environment, to closed course testing and millions of miles of on road testing. Then, we brought in TUV SUD to do the same from a third party external validation perspective.
AV Industry Panel – Motional	Representative Shelley Kloba	Third party external validator – are there companies that specialize in that? Who was the specific entity to conduct the external validation?	Motional used TUV SUD, who is an external safety assessor which works in automotive and a number of other fields related to engineering. They looked at the technology itself, as well as the safety processes we said we were following.
AV Industry Panel – Motional	Representative Shelley Kloba	Do you feel that process (external validation) that you followed is one that Motional’s competitors are following?	Cannot speak for our competitors. One of the unique things in this industry is that everyone has their own way of approaching this, and has brought in their own experts that feel they are doing it the best way possible, which pushes us all to innovate on safety and the technology itself.



MEETING SUMMARY

Presentation	Participant	Question / Comment	Presenter Response
AV Industry Panel – Motional	Bryce Yadon	Regarding comments made during the presentation on congestion, moving cars from the roadway, speeding up traffic without adding lanes – When a bus holds 40-80 people, and we are putting 2-3 people per car, we still have more vehicles on the road replacing the bus. How is Motional thinking about it in terms of the geometry, how do we get past that without adding lanes and causing significant disruption to our roadways?	<p>No one is advocating we get rid of buses.</p> <p>As AVs become more accepted and operational technology, we are going to move from more of a personal vehicle ownership model to a subscription model, especially in major cities. Most of us do not love owning a difficult and expensive asset that we have to maintain and pay for insurance on. If we get to the point where people are comfortable subscribing, you no longer have that asset sitting in your driveway to be your first choice to get somewhere. Once you start making those changes in economic choices for how you travel – AV, bus, bikeshare, etc. – you can start to determine the price point for you for that particular trip, that is partially how you move away from single occupancy vehicle miles.</p> <p>Also, once you move to a subscription model for vehicle usage, you'll start to see the shift towards dynamic routing and greater comfort to 6, 8, 12 person shuttles that address some of the challenges we face with a fixed bus network. We don't want to replace those, they are the backbone of our transit system. However, there is convenience in between that is a tough sell for folks that want to pay for the convenience.</p>



MEETING SUMMARY

Presentation	Participant	Question / Comment	Presenter Response
AV Industry Panel – Motional	Bryce Yadon	What do we do with these cars at night?	Right now, we very inefficiently allocate our space for vehicle storage. We place it conveniently where you are, which is often the most expensive parts of a city, where we put housing, rather than rural land or warehouses. We have the ability to more efficiently allocate that space, putting vehicles together in a fleet facility, using a 3D space more efficiently in less valuable parts of the city.
AV Industry Panel – Motional	Representative Shelley Kloba	The data sharing that Motional has been doing, it was mentioned during the presentation that has encouraged others to do similar types of sharing of their data sets, which is a key element of good machine learning. Are you aware of other companies that have done the same type of data sharing?	<p>After a few of these data sets were published, some done with other companies, we know others released. Motional can provide a list of those other datasets.</p> <p>When everyone shares, it is better for everyone. Motional chose to put it out there, others were pleased to join in, and we were happy to join in on others' data sharing initiatives.</p> <p><i>Waymo also provided a link to their open dataset published on their website https://waymo.com/open , as well as a copy of their safety information and report https://waymo.com/safety/ in support of this industry conversation.</i></p>



MEETING SUMMARY

Presentation	Participant	Question / Comment	Presenter Response
AV Industry Panel – Designated Driver	Representative Shelley Kloba	In regards to personal delivery devices (PDDs), where a pedestrian, wheelchair, stroller pusher, etc. is on a sidewalk and the PDD sees them, recognizes they are supposed to yield which just means freeze in place, which then the other user leaves the sidewalk (into the grass, street, etc.). Is Designated Driver working with any of the companies utilizing the PDDs, it seems like teleoperations technology could be the perfect solution to those situations.	Designated Driver is not currently working with any of those types of organizations. The sidewalk delivery robots are trying to build some flavor or remote driving in-house. Designated Driver does work with agriculture companies, robotaxis, shuttles, yard automation, airports, but not small delivery robots.