

Wisconsin Automated Vehicle External (WAVE) Advisory Committee
Meeting Minutes
October 12, 2022 - 9:00am-1:00pm
- Meeting Held Via Video Teleconference -

WAVE Members Present: Steve Caya, Dan Fedderly, Robert Fischer, Josh Fisher, Chris Hardy, Art Harrington, Nathan Houdek, Nick Jarmusz, Luke Junk, Jeff Lewandowski, Rick Lucero, David Noyce, Raymond Mandli, Cory Mason, Nick Musson, Jennifer Neugart, Damon Payne, Sandie Pendleton, Sia Prosper, Xiao Qin, Adonica Randall, Jeff Smith, Yang Tao, Evan Umpir

WAVE-Member Organization Proxies Present: Chris Hiebert, Christian Plata, Savannah Stevens

Wisconsin Department of Transportation (WisDOT) Staff Present: Stephanie Arduini, Brad Basten, Vince Bauer, Kathey Bilek, Evelyn Bromberg, Hannah Brown, June Coleman, Tracy Drager, Brian Elliott, Kyle Hemp, Ali Misun, Mike Kessenich, Mark Knickelbine, Elizabeth Lloyd-Weis, Reed McGinn, Dave Pabst, Rodney Saunders Jr., Ethan Severson, Ryan Spaight, Rebecca Szymkowski, Craig Thompson, Kaleb Vander Wiele

- **Welcome and Opening Remarks**
 - Craig Thompson, WisDOT Secretary

Secretary Craig Thompson welcomed committee members to the spring 2023 WAVE meeting, thanking them for taking time out of their schedules to discuss connected and automated vehicles (CAVs). The Secretary mentioned the theme for the meeting was to hear about the progress WisDOT has made in preparing for CAV technology. Secretary Thompson emphasized the importance of input from the members as the department values their perspectives on this transformative technology.

- **Meeting Overview and Recap of March 2022 WAVE Meeting**
 - June Coleman, Bureau of Performance Improvement, Research and Strategic Initiatives Director

June Coleman welcomed the attendees and provided an overview of the meeting agenda. June mentioned the topics for the March 2022 WAVE Advisory Committee meeting focus on CAV safety as it relates to law enforcement, first responders and vulnerable road users. Thirty WAVE member organizations attended the March 2022 meeting in addition to seven members of the Wisconsin Non-Driver Advisory Committee.

- **Wisconsin Electric Vehicle Infrastructure Plan**
 - Kaleb Vander Wiele, Division of Budget and Strategic Initiatives

Kaleb Vander Wiele presented an overview of the Wisconsin Electric Vehicle Infrastructure Plan noting that the plan is now posted on our website.

- **Voices of the WAVE**
 - WAVE Members

Four committee members – Art Harrington, Ray Mandli, David Noyce, Xiao Qin - provided an update on their recent CAV-related activities.

- **WisDOT CAV Strategic Work Plan Update**
 - Brad Basten, Division of Budget and Strategic Initiatives

Brad Basten gave an overview of the [CAV Strategic Work Plan](#) and provided project updates from the Work Plan key objective areas.

- **WisDOT Law Enforcement and First Responder Training Pilot**
 - Brad Basten, Division of Budget and Strategic Initiatives

Brad Basten presented a synopsis of the WisDOT Law Enforcement and First Responder Training Pilot, which occurred in collaboration with the University of Wisconsin – Madison’s Traffic Operations Lab, the City of Racine and Gateway Technology College.

- **Current legal status of CAVs in Wisconsin**
 - Vince Bauer, Office of General Counsel

Vince Bauer provided an overview of the legality of CAVs in Wisconsin’s statutes, highlighting that a driver is required to be behind the steering wheel and in control of the vehicle in Wisconsin. Vince continued by mentioning that platooning is legal in the state.

- **Overview of CAV technology on the road today**
 - Liz Lloyd-Weis, Division of Transportation System Development

Liz Lloyd-Weis presented on types of connected and automated vehicle technology on the road today. In addition, Liz provided information on the technology advancements that support CAV technology in work zones, such as high contrast pavement markings, smart sensors and autonomous truck mounted attenuators.

- **WisDOT Bureau of Traffic Operations CAV-related infrastructure update**
 - Liz Lloyd-Weis, Division of Transportation System Development

Liz Lloyd-Weis provided information about WisDOT’s Bureau of Traffic Operations activities as they relate to connected and automated vehicles. Liz’s presentation highlighted the following:

- High contrast pavement markings
- Smart Work Zones
- WisDOT’s participation in national CAV activities
- The Bureau of Traffic Operations Connected Vehicle Pilot Project

- **WAVE Assessment and Membership Survey**
 - Ethan Severson, Division of Budget and Strategic Initiatives

Ethan provided an overview of the responses to the 2022 WAVE Assessment and Membership Survey.

- **WAVE committee recommendations from previous meetings**
 - Ethan Severson, Division of Budget and Strategic Initiatives

Ethan Severson presented recommendations from WAVE committee meetings held over the last two years. The recommendations are categorized by topical area: communication; research, pilot and testing projects, infrastructure preparedness; funding; legislation; and general. The recommendations can be found in Appendix B.

- **Small Group Discussions**

Attendees moved into facilitated small group breakout rooms to discuss the following five questions. A summarized list of responses to the questions can be found in Appendix A.

1. Which recommendation(s) do you think would most improve your organization's readiness for CAVs?
2. Which recommendation(s) do you think would most contribute to Wisconsin's readiness for public use of CAVs?
3. Are there any recommendations that are missing or should be expanded on?
 - What potential action items exist for the presented or small group identified recommendations?
4. What component(s) of the CAV Strategic Work Plan is your organization most interested in learning more about during future updates to the WAVE Advisory Committee?
5. How has/how will your organization plan for future implementation or prevalence of CAV technology?

- **Report out – small group discussion**

Each small group was called on and asked to share their main takeaway from the WAVE meeting and the small group discussions.

- **Closing Remarks**

- June Coleman, Bureau of Performance Improvement, Research and Strategic Initiatives Director

June Coleman thanked the members for their participation in the meeting and highlighted the importance of their input as the state continues preparing for connected and automated vehicles.

Appendix A - Summary of Responses to Small Group Questions – October 12

Note: Responses are not listed in any particular order and may have been mentioned by multiple groups.

1. *Which recommendation(s) do you think would most improve your organization's readiness for CAVs?*

- Communication is most important for enhancing readiness plans.
- The roadshow recommendation could be a big deal to bring in an expanded/diverse audience. Better to share information with various outreach efforts.
- More opportunities for research to widen our expertise on CAVs in the state. Equity perspective with different study areas and communities. Students would love pilot programs on campus to use.
- Invest in infrastructure improvements that are usable by CAVs.
- There is a need for training of other agencies, such as first responders, and municipalities in regard to the enforcement of laws relating to CAVs.
- Determine legislative updates that will affect private sector advancements.
- Encourage partnerships to assist in the development of this technology in Wisconsin. An example would be a demonstration of CAV technology.
- Determine what the security and privacy framework is going to look like.
- Determine how the traffic incident management center will track and manage CAVs.

2. *Which recommendation(s) do you think would most contribute to Wisconsin's readiness for public use of CAVs?*

- Updating infrastructure to incorporate this technology is critical.
- Public-Private Partnerships (PPP) are key to get input as public cannot do it alone. CAV technology development is driven by industry and the users. Critical to have business at the table and work collaboratively.
 - Regulation or policy through legislation better have strings attached (tangible items) for the body to see for PPP to work. Important to recognize/meet expectations.
- Urban areas are ready for this, but perhaps not rural areas and possibly a tough sell to rural communities.
- Harmonize legislation across state lines, so as not to disadvantage WI tech companies, economy, and researchers.

3. *Are there any recommendations that are missing or should be expanded on?*

- *What potential action items exist for the presented or small group identified recommendations?*
 - Consider that people use ATVs throughout the town as regular vehicles. Also, three wheeled vehicles.
 - Include mobility devices and physical assistance mobility. Additionally consider that CAVs may be able to communicate with vulnerable road users through cell phones or similar devices.
 - Special roadway users and underserved communities. Tesla are not cheap (\$60k-\$80k) and are not affordable to underserved. Some people may be disconnected due to that.
 - There is a potential need for ensuring broadband connectivity across the state for CAV technology to be successful.
 - John Deere pioneered farm equipment connectivity years ago and may be further along. "Precision Agriculture." This advancement should be paid attention to as there are relatable use cases.
 - Interviewed by UW researcher for rural communities, broadband, and farming...how do we connect those pieces?
 - Long-term planning for funding and spending.
 - Establish an AV corridor for roadway users to get used to the technology, similar to what Michigan is doing.

- What kinds of tech vehicles should have regarding transit agencies? Are these technologies standard or are they add-ons? Auto manufacturers will be putting these into vehicles, need to think proactively.
- Important the CAV policy keeps cyclists and other small transportation mode users are kept safe. Does CAV result in safer roads for everyone, all users? Focus on how we establish that and needs to be based in solid research.
- Develop a scorecard or tool to assess Wisconsin's readiness and goals surrounding CAVs.
- Plan for the future MUTCD standards. For example, lane keep in vehicles, but paint stripes need to have the correct reflectivity.

4. *What component(s) of the CAV Strategic Work Plan is your organization most interested in learning more about during future updates to the WAVE Advisory Committee?*

- Rural outreach. What can we do locally and throughout the state? People don't like the idea of electric vehicles. Goes back to affordability and accessibility. Need equity and show how it will affect peoples' lives.
- There are many misperceptions or allegiance to gasoline and a push to not go towards CAV. Education and communication are so important going forward.
- Work zone safety is important and the education components around increasing safety in work zones.
- Polling the field and seeing what questions we haven't investigated yet. Troopers have a lot of insight into roadways and their input would help WAVE.
- Statute, policy, and regulations – starting point for CAV-related initiatives moving forward.
 - "State of the state" for current policies.
- Pilot testing – include disability community, community would be interested in participating to ensure technology works with those with various disabilities – will this really work in the real world?
- Wisconsin should be funding or cooperating with other states to do research on CAVs and cyclists and other vulnerable populations so that the roads of the future are safer than the roads today.

5. *How has/how will your organization plan for future implementation or prevalence of CAV technology?*

- Curricular perspective: How do we add materials into transportation related courses. Solutions and challenges to consider. Some investment is needed to recruit faculty and staff.
- Perhaps we can look at education programs with that budgeting discussion.
- Continuing to work on our partnerships with WisDOT and other entities. We need to continue educational pieces.
- An organization has had conversations about autonomous technology for moving freight and will continue watching those technology developments.
- WAVE needs to put together a library of knowledge and provide training programs.
- Educating disability community and partnership agencies.
- Creating FAQ sheets to assist with information sharing – catering information to appropriate audience.
- Building special sensors on new requirements on existing infrastructure. Sensors are designed to read reflectivity and physical road. Currently mapping the quality of the infrastructure, condition assessment.

Appendix B – WAVE Advisory Committee Recommendations – October 12

The information in the table below contains recommendations from the Wisconsin Automated Vehicle External (WAVE) Advisory Committee as presented at the October 12, 2022, meeting.

Recommendation	Topical area
Develop a communication and outreach plan to address the limited awareness and perceptions of CAV technology for various message groups	Communication
Conduct CAV trainings (e.g., safety preparation for first responders and law enforcement)	
Create a travelling “roadshow” highlighting CAV technology	
Develop an online repository/clearinghouse to: <ol style="list-style-type: none"> 1. Encourage and facilitate transfer of knowledge, guidance, and best practices 2. Share data/information that can help mitigate concerns about potential dangers 	
Focus research on specific road users (motorcycles, work zones/workers, first responders, law enforcement, aging and disabled communities). Be sure to involve those road users throughout the process	Research/Pilots/Testing
Identify potential partners, private, public, academic, etc. to participate in projects. Conduct outreach on what the groups care about and then develop a project	
Research how CAV technology will handle Wisconsin's inclement weather (e.g., snow and extreme cold)	
Develop an overarching framework for pilots to ensure pilots are in line with advancing WisDOT’s vision and plan	
MUTCD requirements need updating prior to CAV widespread adoption (pavement markings, etc.) State government should push the federal government on standardized definitions and infrastructure	Infrastructure preparedness
Update infrastructure to accommodate CAVs. Include fiber communications and ITS infrastructure on roadway projects. Consider these when ranking/prioritize projects	
Provide information and support on federal and state grants and funding opportunities. Including grant application templates and applicable technical information	Funding
Determine if Tax Incremental Financing options can be used for CAV projects	
Dedicate funding sources and incentives for CAV infrastructure pilot projects (e.g., a competitive grant process modeled after the Small Business Innovation Research Program)	

Determine if/how legislative updates done to improve safety will affect private sector advancements	Legislation
Harmonize legislation across state lines	
Determine what the security and privacy framework is going to look like	General
WisDOT can take leadership in measuring equity in CAV technology (ex. deployment of connected pedestrian safety technology), creating standards and baselines for measuring	
Determine how the traffic incident management center will track and manage CAVs	