

Wisconsin Automated Vehicle External (WAVE) Advisory Committee
Meeting Minutes
September 28, 2021 9:00am-2:50pm
- Meeting Held Via Video Teleconference -

WAVE Members Present: Steve Caya, Jerry Deschane, Robert Fischer, Josh Fisher, Paul Fontecchio, Chris Hardy, Arthur Harrington, Nathan Houdek, Luke Junk, Neal Kedzie, Jeff Lewandowski, Raymond Mandli, Cory Mason, Steven Michek, Nick Musson, Jennifer Neugart, David Noyce, Damon Payne, Alexander Pendleton, Stephanie Sward, Thomas Wagener, Tyler Wenzlaff

WAVE-Member Organization Proxies Present: Christopher Hiebert, Daniel Holt, Mike Long, Edwin Rothrock, Tom Winker

Guests: Hana Creger, The Greenlining Institute
Brandon Pitts, Purdue University
Nico Larco, Urbanism Next Center
Carolyn McAndrews, UW-Madison

Wisconsin Department of Transportation (WisDOT) Staff Present: Stephanie Arduini, Brad Basten, Allison Blackwood, June Coleman, Tracy Drager, Michael Denruiter, Alexander Gramovot, Paul Hammer, David Karnes, Kyle Hemp, Mike Kessenich, Mark Knickelbine, Elizabeth Lloyd-Weis, Reed McGinn, Joel Nilsestuen, David Pabst, Stacey Pierce, Joshua Reed, Anne Reshadi, Ian Ritz, Rodney Saunders Jr., Ethan Severson, Ryan Spaight, Aileen Switzer, Kaleb Vander Wiele, Charles Wade

- **Welcome and Opening Remarks**
 - Paul Hammer, WisDOT Deputy Secretary

Deputy Secretary Paul Hammer welcomed Committee members to the third WAVE meeting, thanking them for taking time out of their schedules to discuss this critical topic. Deputy Secretary Hammer mentioned the first two meetings threw a wide net around the opportunities and challenges facing Wisconsin surrounding the future of connected and automated vehicle (CAV) technology, and this meeting will cover issues of transportation equity. Deputy Secretary Hammer stated, "We must go beyond simply avoiding inequity. We should also think creatively about how CAV technology can promote greater equity in our transportation system by making more and better mobility options available." Deputy Secretary Hammer closed by mentioning that many of the ideas and objectives emerging from the CAV process are in response to the input received from the WAVE Advisory Committee.

- **Meeting Overview and Recap of 2nd WAVE Meeting**
 - Aileen Switzer, Division of Budget and Strategic Initiatives Administrator

Aileen Switzer welcomed the attendees and provided an overview of the meeting agenda. Aileen mentioned the topics for the March 2021 WAVE Advisory Committee meeting focused on budget and infrastructure issues for local and tribal governments, innovation in technology, and a connected and autonomous vehicle pilot studies panel. Twenty-seven WAVE member organizations attended the March 2021 meeting.

- **WisDOT CAV Strategic Work Plan Update**
 - Brad Basten, Division of Budget and Strategic Initiatives
 - Mark Knickelbine, Office of Public Affairs

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

Mark Knickelbine summarized the recent work of the CAV Strategic Work Plan Communications and Outreach Subcommittee. The subcommittee has been developing a CAV communications messaging plan. Three example messages common to all Wisconsin audiences are:

1. “CAVs are real and here”
2. “CAVs has the potential to improve safety and address other pressing transportation needs”
3. “While there are still many questions regarding CAV, WisDOT is actively addressing key issues and is committed to keeping stakeholders and the public informed and involved”

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

Five Committee members – City of Racine, UW-Madison TOPS Lab, ITS Wisconsin, Roadview, Mandli Communications - provided an update on their recent CAV-related activities.

- **Connect 2050 Update**
 - Alex Gramovot, Division of Transportation Investment Management

Alex Gramovot provided an update on the development of the *Connect 2050* Long Range Transportation Plan. The document is a long-range, statewide multi-modal plan and is a federal requirement. The draft plan will be revised as needed after considering public and stakeholder input. The *Connect 2050* is scheduled for publication in Winter 2021-2022.

- **Panel: CAVs and Transportation Equity – A National Look**
 - Facilitator: Rodney Saunders, Jr., Division of Budget and Strategic Initiatives
 - Panel Members:
 - Hana Creger, The Greenlining Institute
 - Brandon Pitts, Purdue University
 - Nico Larco, Urbanism Next Center

Hana Creger presented on the Greenlining Institute’s Mobility Equity Framework and how it relates to advancing equity in autonomous vehicles. Hana began with saying that innovation does not always mean technological innovation. It should be referred in terms of how we do transportation planning and decision making and how we engage communities in that process. The Greenlining Institute and the Mobility Equity Framework advocates for conducting a community needs assessment before giving the green light to autonomous vehicles. The framework can be broken down into the following steps:

- Step 1 – Community needs assessment (in the form of a survey or workshop)
 - Determine community-identified mobility needs
 - Educate community on mobility equity
 - Community brainstorms project ideas
- Step 2 – Mobility equity analysis (to compare different options)
 - Equity analysis of projects
 - Prioritization of projects
 - Project proposals
- Step 3 – Community decision-making (the community votes on which options to implement)
 - Voting

Brandon Pitts' presentation discussed the relationship between older adults/aging populations and CAVs in relation to equity. Brandon stated that the fastest growing age group in the country is the 65 and older population. Brandon mentioned that this age group is often not specifically focused on during AV equity discussions. Brandon continued the presentation with three surveys of older adults to understand their travel patterns, attitudes for purchasing a self-driving vehicle, perceptions of autonomous vehicles, and cross-generational interest in vehicle technologies.

Brandon presented a study conducted by the Purdue University Next-generation Human-systems and Cognitive Engineering Research Lab, focusing on "takeover performance" with older populations and a level 3 autonomous vehicle. Brandon concluded the importance of acknowledging difference in perceptions and opinions of populations even within the same age group.

Nico Larco presented on autonomous vehicles' impacts on cities and policy recommendations if governments do not get actively involved in planning for deployment.

- Congestion
 - Nico stated that "Uber is travelling 2.8x more vehicle miles travelled per trip" than a private use vehicle because of "cruising" and "deadheading" and that ride-hailing services have a negative impact on transit services. Adoption of AVs could have a similar effect as ride-hailing services, contributing to congestion
- Parking
 - Parking is the single biggest land use by surface area in cities and urban areas. The adoption of AVs, either for fleet or personal use, could lead to a reduction in parking needs
- Urban sprawl
 - The adoption of AVs could increase urban sprawl as they open up opportunities for users to live further away from the urban area, leading to more land and habitat consumption
- Inequity
 - AVs may increase mobility inequity because of:
 - Limitations in understanding and accessing the technology
 - Difficulty accessing the technology in some areas, e.g., rural areas
- **WisDOT Connected Vehicle Pilot Update**
 - Anne Reshadi, Division of Transportation System Development

Anne Reshadi provided an overview of WisDOT's connected vehicle pilot. Anne stated that one of the main areas of focus for the Bureau of Traffic Operations is to maximize the safety and operations of our existing highway system. Anne reviewed the three phases to the connected vehicle pilot:

1. Phase 1 – Demonstrate hardware and software functionality in a laboratory setting within WisDOT's existing operational environment (completed Fall 2020)
2. Phase 2 – Demonstrate hardware and software functionality in a field setting within WisDOT's existing environment (anticipated completion Fall 2021)
3. Phase 3 – Partner with the City of Madison and UW-Madison's Traffic Operations and Safety Laboratory to integrate with and extend the Park Street Connected Corridor in Madison (anticipated completion Winter 2022)

- **Panel: Wisconsin – Public Transportation, Equity, and CAVs' Impact**

- Facilitator: Ryan Spaight, Division of Budget and Strategic Initiatives
- Panel Members:
 - Carolyn McAndrews, University of Wisconsin – Madison
 - Tom Wagener, Wisconsin Public Transportation Association
 - Art Harrington, WI ACES

Carolyn McAndrews presented how autonomous vehicles may uniquely benefit Wisconsin's non-driving populations. Carolyn highlighted data from the 2017 National Household Travel Survey show that 22% of Wisconsin residents are non-drivers. Carolyn indicated that 33% of Wisconsin non-drivers (163,000) have a medical condition and 6% of Wisconsin drivers (264,000) have a medical condition. CAVs have the potential to benefit individuals with medical conditions that affect their travel whether they are drivers or non-drivers.

Carolyn discussed WAVE's support for AV pilot projects on practical issues such as medical transportation, workforce mobility, and addressing congestion. Carolyn stated that AVs can expand access to the transportation system for non-drivers. The concerns for future AV deployment projects are similar to the current concerns surrounding transit expansion and integration. Carolyn recommends investing in current systems to build capacity for future AVs.

Tom Wagener began his presentation by mentioning there is limited implementation of CAVs in public transportation in Wisconsin, but we should anticipate it will happen over time. Important considerations as CAVs are deployed include:

- Invest in infrastructure – communities with fixed route systems will need upgrades (example: terminals and fixed guideways)
- Accessible Public transportation – public transportation is designed to support non-drivers and relieve congestion.
- Differences in rural and urban area needs - both require access to the new technology to either link users up with the existing public transportation system or to have the technology serve individual transportation needs
- Encourage and enable public and private partnerships – when thinking about equity, we need to think about more than just the first mile/last mile. Think about the first 50 feet/last 50 feet for some, and the first 50 miles/last 50 miles for rural areas
- Rulemaking – develop a broad definition of what it is to be public transportation
- Promote and focus on the shared-use aspects of the technology

Art Harrington presented on shared mobility CAV impacts on equity and policy suggestions, focusing on low income and communities of color. Art's presentation indicated adverse impacts of CAVs, as well as potential benefits, and policy recommendations, as they relate to low income and communities of color.

- Adverse impacts of AVs on low income and communities of color
 - Financial and technological
 - Public transportation
 - Potential to increase air pollution
 - Insufficient data on impact of AVs
- Potential environmental and safety benefits for low income and communities of color
 - Reduced fuel consumption (and associated pollution)
 - Reduction of congestions reduces logistic costs
 - Safety – example: “systems with Automated Emergency Braking see a 40% reduction in rear-end collisions”
- Policy considerations for private shared mobility providers to minimize adverse impacts to low income and communities of color
 - Reduce financial/technological barriers for use

- Address how communities will have access to the technology without a smartphone app (e.g., smart cards, kiosks)
- Require training to enhance access to AVs, 24/7 access to the service, and options for users to ask questions about the service
- Include tax incentives for private transportation providers
- Potentially restructure government for a new agency dedicated to handle AVs

- **Small Group Discussions**

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

1. What are the biggest risks that the adoption of CAVs might present to public transportation or transportation equity in Wisconsin?
2. What transportation equity benefits will be delayed if CAVs are adopted in Wisconsin slowly?
3. What could state government do prior to the widespread adoption of CAVs to mitigate the concerns from questions #1 and #2?

- **Individual Takeaways from the meeting and small group discussions**

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

- **Closing Remarks**

- Joel Nilsestuen, WisDOT Assistant Deputy Secretary

Assistant Deputy Secretary Joel Nilsestuen thanked the committee members, WisDOT staff, and panelists for their time and participation. Assistant Deputy Nilsestuen stated, “One of our primary objectives is to manage the adoption of CAV technology in a way that all people in Wisconsin can benefit from it.” And that “the feedback you’ve given us has been helping us actively shape WisDOT’s policies and priorities regarding CAV technology. We look forward with continuing this partnership.”

Appendix A - Summary of Responses to Small Group Questions – September 28

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

1. *What are the biggest risks that the adoption of CAVs might present to public transportation or transportation equity in Wisconsin?*
 - Current funding and revenue mechanisms (infrastructure or transit) do not account for CAV impacts
 - Will grant money be enough to motivate equitable service by private sector?
 - Is it realistic to assume the cost for CAV shared mobility will be competitive with traditional transit? Will it be equitable?
 - Our multi-modal system is very diverse, but if our funding doesn't expand, we will have difficulties in adopting CAVs
 - Example – rural areas may dedicate funding to maintain the current infrastructure system instead of investing in or preparing for CAVs
 - Address the perceptions surrounding CAVs
 - Individuals are used to having their own vehicles. May need to change the culture around shared vehicles
 - Convincing current users that CAVs may be a more equitable option
 - Public officials may think CAVs could replace public fixed route transit
 - There is still some concern regarding how the CAV technology will end up being. What are the potential disruptions from the advancing technology?
 - CAVs may not be able to reduce traffic congestion or emissions
 - Inequitable distribution of CAVs and CAV services
 - Smaller communities may not see the same benefits as urban areas
 - Services like Uber/Lyft may continue to focus on urban and high-density areas
 - Potential disruption to existing transit services such as reduced ridership. This may in turn discourage communities in providing transit services
 - How will CAVs fit within public transit systems?
 - Fundamental fiction in public/private partnerships, nonprofit/service vs profit
 - How do we involve the private sector in serving all communities/areas?
 - Fulfilling the needs of the last mile for those with no other options as well as having opportunities for everyone else
 - People with disabilities are eager for this tech to be adopted; decrease isolation; improvement to public transportation; last mile opportunities, accessibility to transit (bus stops, etc.); serving people in rural areas where public transit does not exist
 - We are getting older in rural areas and the older folks will need those public transit options. We are very likely going to increase the disparity between rural and urban areas as we move forward
 - How does the public and politics rally behind equity?
2. *What transportation equity benefits will be delayed if CAVs are adopted in Wisconsin slowly?*
 - CAV technology may be expensive and cause an increase in inequity for Wisconsinites
 - Those facing transportation challenges now may not be able to afford the initial integration of the new technology
 - Slow adoption may favor the wealthy while creating a disadvantage for low income, disabled and communities of color
 - Potential for disconnect if favoring users such as freight versus wide-spread adoption
 - Transportation is big barrier to employment for low income, disabled, communities of color – delayed adoption could negatively impact the potential transportation opportunities provided by CAVs
 - Too reliant on private sector; public investment needs to be considered
 - The current focus of CAVs has been on understanding the technology. There needs to be a focus on the users from the equity standpoint

- The slow adoption could lead to a delay in getting workers to employers as there are jobs outside urban areas that are going unfilled
- There is a difference between CVs and AVs. CVs promise safety and mobility benefits for all transportation users and the technology is available now. AV technology will take longer to deploy
- Overall societal benefit does not mean equitable - urban vs. rural
 - Transportation improvement districts could be used to promote/implement shared-use AVs
- CVs are only desirable if there is corresponding infrastructure
- Continuity with jurisdiction changes
- The possibility for expanded service hours and customizable routes
- Access to consistent, safe, and reliable transportation for those who are not able to adopt CAV technology and realize the safety benefits that the technology provides
- Infrastructure concerns including fiber and connectivity
- Focus on better driving habits as technology advances from where we are
- WI may be at a competitive disadvantage if other states implement CAVs faster
 - AVs have the potential to assist with the labor shortage

3. *What could state government do prior to the widespread adoption of CAVs to mitigate the concerns from questions #1 and #2?*

- The state needs to look at how it funds transportation at the state and local levels and come up with long-term solutions. Funding challenges will continue and may become more challenging
 - Provide adequate funding for smaller communities to adapt to and adopt technology
- Can we measure equity and are we improving?
 - Prioritize those users with the greatest need
- WisDOT can take leadership in measuring equity, creating standards and baselines
 - WAVE should focus more on standards, legality, roadway standards
- Could conduct testing before adoption of CAV technology
 - Potentially fund local pilot projects
 - Include non-drivers in planning of pilot projects
 - Variation in pilots – urban/rural, personal/public mobility
 - Begin testing the theories behind the technology
- Education focused on current and available technology instead of future technology
- Determine the costs, benefits, and priorities
- Fit into existing infrastructure rather than make infrastructure fit CAVs
- Update infrastructure to accommodate CAVs
 - Include fiber communication and ITS infrastructure on roadway projects. Consider these needs when ranking/prioritizing projects
- Carbon/mileage tax dedicated to public transportation
- Develop strategies to work with AASHTO and MASTO to influence federal policy
- Provide flexibility in regulation (example – operating AVs on state facilities)
- Generate and ensure policy recommendations are inclusive
- Promote a culture shift from personal vehicles
 - Encourage business owners to maintain their own CAV fleets
- Incentivize system development improvements (i.e., jobs or housing), not vehicles or technology
- Steer the public towards shared use and mass transit
- Consider the impact of bicycles on last mile of mobility
- Work through MPOs, RPOs and tribes. Have open conversations with these groups often and get them involved