

Wisconsin Automated Vehicle External (WAVE) Advisory Committee

Meeting Minutes

May 7, 2024 - 9:00 a.m. – 2:45 p.m.

Rm N108, Hill Farms state office building, 4822 Madison Yards Way, Madison, WI

Attendance

WAVE Members Present: Representative David Considine, Debby Jackson, Luke Junk, Jeff Lewandowski, Raymond Mandli, Maggie McNamara, David Noyce, Alexander Pendleton, Xiao (Shaw) Qin, Evan Umpir, Kurt Walker

WAVE-Member Organization Proxies Present: Andrea Bill (UW-Madison Traffic Operations and Safety Laboratory), Andrea Davenport (Wisconsin Office of the Commissioner of Insurance), Adele Edwards (City of Racine), Ben Schmid (Baird), Brian Scharles (TAPCO)

Guest Presenters: Jake VandeLoo (Schneider Trucking), Matt Umhoefer (WisDOT), Lt. Tim Austin (Wisconsin State Patrol)

Freight Advisory Committee (FAC) Members Present: Mei Cao (University of Wisconsin – Superior), Tim Fiocchi (Wisconsin Farm Bureau Federation), Maria Kurniati (Transmart Inc.), Carl Suhr (Kwik Trip), Don Vruwink (Commissioner of Railroads)

Wisconsin Department of Transportation (WisDOT) Staff Present: Joel Nilsestuen, Lea Collins-Worachek, June Coleman, Brad Basten, Carter Angelo, Stephanie Arduini, Mike Denruiter, Tracy Drager, Brian Elliot, Kyle Hemp, Jeremy Kloss, Dave Leucinger, Alex McMurtry, Jordan Montgomery, Johanna Schmidt, Sarah Simonson, Todd Szymkowski, Maryne Taute

Meeting discussion

Welcome and Opening Remarks - WisDOT Assistant Deputy Secretary Joel Nilsestuen thanked everyone for taking the time to attend WisDOT's spring WAVE meeting, noting how this advisory committee's feedback and perspective is crucial to help shape the policies needed to integrate Connected and Automated Vehicle (CAV) technologies. Consideration and collaboration from all levels of government, industry and citizens is needed. WisDOT recently hosted the American Association of State Highway and Transportation Officials (AASHTO) in Madison this spring, is partnering with Colorado and other states to trial a driverless crash attenuator truck to protect road work crews and is partnering with Columbia County on Phase II of the Work Zone Data Exchange pilot project. WAVE's active collaboration helps us all innovate and find the safest and most efficient use of our resources, because ultimately, safety is our top priority.

Meeting overview and recap of November 2023 meeting – WisDOT Division of Budget & Strategic Initiatives (DBSI) Administrator Lea Collins-Worachek provided a recap of the previous WAVE meeting highlighting updates on federal discretionary grants, university research in connected and automated vehicles, government research in connected and automated vehicles, industry research in connected and automated vehicles.

Technology: Humans and new technology - Dr. David Noyce, UW Madison, *National Science Foundation (NSF) - Future of Work at the Human-Technology Frontier (FW-HTF) initiatives.*

Dr. Noyce discussed how research into the future of trucking and the remote operation of trucks is considering the role of Automated Vehicle (AV) technology, how this can affect driving risks and improving trucking, the backbone of freight movement. NSF research goals look to understand high speed highway use and the human element in operator control. Project tasks include automation oversight, cooperative automation, and real-time information exchange. Development in *Future Work* is looking forward to operational policy, safety and job quality in technology adoption. Focus on *Future Workers* is concerned with job gains and losses and integrating current skills with future skills. Remote operation is necessary with simulation and regulatory challenges to be worked out. National Highway Traffic Safety Administration (NHTSA) is making this new data accessible. Early adoption will likely be short local deliveries and long-haul routes. These advancements can have a positive effect on road safety.

Technology: Policy and deployment - Adam Kasliszewski, CAVNUE, *Austin Texas automated trucking and freight corridor and Michigan passenger car AV corridor.*

Mr. Kasliszewski discussed how the Texas *SH 130 Smart Freight Corridor* will use Cavnue's technology of digital infrastructure and sensor systems to make the corridor better equipped to support AV trucks. Michigan's I-94, 3-mile westbound corridor will eventually create an exclusive lane for CAV passenger cars, supported by Ford, Audi, and GM.

Projects like these need a champion in the Texas Department of Public Safety, active public engagement, and an accessible webpage for all project information. Disseminating roadway conditions that are of high interest to AV Operators (work zones, weather data, incidents) makes these projects valuable and attract industry support. Technology changes quickly so projects should focus on immediate outcomes and plan for retrofitting. Sharing data for future use should be planned. Two companies plan to deploy a limited pilot of driverless trucks in late 2024.

Technology: Semi-automation and safety - Jake VandeLoo, Schneider National, *Automated Driver Assist Systems (ADAS) features in trucking and industry perspective of results.*

Mr. VandeLoo shared industry experiences and safety improvement results from implementation of Automated Driver Assist Systems (ADAS) on trucks that provide safety enhancing equipment for driver and other drivers on road such as Side Guard Assist, auto wipers and lights, emergency braking/rear collision protection, and active brake assist for pedestrians and moving vehicles. Active Brake Assist will be required on passenger cars in 2030 but not commercial vehicles. Schneider is mandating this technology on their vehicles due to the safety benefits. Adaptive Cruise Control and Collision Mitigation have resulted in a 68% reduction in rear-end crash frequency, a 95% reduction in rear crash severity. 96% of the Schneider fleet is outfitted with collision mitigation. Camera monitoring technology (e.g., MirrorEye) replaces side vision mirrors enhancing visibility and improving fuel efficiencies but is only available as aftermarket systems.

Operations: Law enforcement interactions - Lt. Timothy Austin, WisDOT Division of State Patrol, *CVSA-FMCSA inspection process for automated trucks.*

Lt. Austin described how the *Roadside Interventions Effectiveness Model* shows that roadside truck inspections are proven to prevent crashes, injuries, and deaths. The Commercial Vehicle Safety Alliance (CVSA) outlines the truck inspection processes and has created a proposed *Enhanced CMV Inspection Program* for AV trucks. This program covers data management, inspector training, inspector qualification, hazardous materials, and staging of trucks and trailers. Issues remaining to be worked out include audits of the inspection process, driver records, inspection interval, and timeclock review of driverless trucks.

Driverless truck interactions - Brad Basten, WisDOT, *Driverless trucking stops and truck platooning technology.*

Mr. Basten showed two videos demonstrating AV driverless trucking technology: An Embark trucking video demonstrated a proposed process to perform a driverless truck stop, how to access records and bill-of-lading and communicate with remote operator assistance. A Federal Highway Administration (FHWA) video demonstrated how platooning technology works by electronically linking multiple trucks together to reduce fuel use and adapt for traffic conditions.

Operations: Models, and state policy – Matt Umhoefer, WisDOT, *Automated trucking operational freight models, Automated vehicle traffic model updates, and Differences in state freight policies around the country.*

Mr. Umhoefer discussed factors impacting CAV options for freight including distances traveled, diversity of truck types and company size and operational models. There are 2.97 million trucks on the road with a cost to replace of \$220,000/per vehicle minimum. The perception is that 40% of Americans favor using driverless technology for vehicles and taxis but only 20% for semi-trucks. Adoption is clouded by diversity of vehicles and use cases, risk perceptions, cost of transition, infrastructure conditions, lack of clear priorities and regulations.

Small Group Discussions

Attendees moved into facilitated small group breakout groups to discuss the following questions (discussion takeaways follow each question).

General

- What will be the biggest impacts from automated freight on economics, truck drivers, or safety?
 - Need public investment for public sector with Vehicle to Infrastructure (V2I).
 - Need private investment in vehicles.
 - Laws need to be updated to take advantage of technology benefits.
 - May open up opportunities for non-traditional drivers.
 - Impact on jobs and companies. May fill labor shortage, eliminate some jobs and open up others. Equipment investments will affect big and small, urban, and rural companies differently.

- Truck driver required processes, e.g., trip checks, labor reporting, refueling, new license, crashes.
- Road chemicals and industrial chemicals may affect sensors.
- Bandwidth may be an issue in areas that have not upgraded.
- What will be the earliest impacts?
 - Automated Driver Assist System (ADAS) to provide earliest effect on safety.
 - Transitive technologies can provide experience an assurance about safety and efficiency of the technology.
 - Liability and insurance must be determined, e.g., co-pilots, and platooning).

Infrastructure

- What infrastructure, physical or digital, is needed from the state? What are the priorities and timelines?
 - Infrastructure needs to be added but existing infrastructure needs to be maintained or brought up to standards for systems and humans. Subsidies will be needed, and growth will happen at states where private companies can take advantage of that investment.
 - Technical infrastructure installation and maintenance can be more expensive than roads. How long with equipment last?
 - Need to evaluate whether 6G is really needed?
 - Most freight moves less than 250 miles, is complete coverage needed?
 - Need solid plan on ownership and use of data.
 - Communication systems like 511 need to be integrated with other systems and vehicles, and real-time data access.
 - Digital twins of infrastructure are needed. Review Madison Bus Rapid Transit as an example.
 - Generative AI will be needed to deal with extreme amounts of data. Security is a concern.
 - The digital infrastructure needed will be immense. The vehicle should be the focus of the infrastructure system, not the roadways which are much vaster and more expensive to replace.

Policy and Process, Operations

- For cross-state trucking, what state-to-state policies are most important?
 - It is extremely important to have consistency across state lines, in technology and regulations. If one state falls behind technologically, the other states suffer, freight corridors across country will need seamless tech that can do the same things and read the road in the same ways to communicate to vehicles.
 - Wisconsin can't accept waivers. Legislation is needed.
 - National Highway Transportation Agency (NHTSA) has not recommended state legislation on intrastate commerce but left that responsibility up to the states. Bring the states together to share policy ideas. Adjoining states have different approaches to many transportation issues and laws.
 - Future technology standards should be standard in new road construction, state and local.
- What are the pros and cons of an AV trucking permit system for driverless trucks similar to Oversize Overweight (OSOW)?
 - Too early to put a permit system in place with technology advancing quickly, ex., does a remote support driver need a Commercial Driver's License (CDL)?
 - Need regulations on how many trucks one remote support person can drive, what unique skills do they require vs a driver, who are they and are they located in your state?
 - Will remote drivers be federally regulated like air traffic controllers?
 - What is permit controlling for?
 - Will self-declared truck AV inspections be audited? Need to hire and train enough inspectors in the new processes. Inspections and record keeping can be standardized and automated.
 - AV trucks should have externally visible sign that indicates it is safe to approach, ex., Mercedes DRIVEPILOT external lighting system.
 - Integrate with other permit systems to reduce red-tape.
 - Software and systems should be qualified as safe to use, not slow down processing of permits or inspections, ex., "System ABC, Release version 12.1.3 = authorized for safe use on interstates."
 - Public support and insurance industry support is important to accept and safely use these systems on the road with others.
 - Permits may constrain AV trucks to certain roads similar to OSOW permits considering driver co-pilots and remote operators.

Technology

- What issues must the technology overcome to be accepted or adopted?
 - Interoperability - Private trucking company data will not be shared, may be sold, need to protect IP but incentivize the data sharing for an interoperable system for all.
 - Data security and privacy, ownership and responsibilities need to be clear.

- Legal liability, who is responsible for a crash, owner, co-pilot, remote operator, manufacturer?
 - Government must be able to react quickly to new technology or new version releases.
 - Federal rules on human overrides when all systems fail is needed.
 - If safety systems are mandated, then it should be difficult to switch them off.
 - Personal ownership of data collected on people such as driving habits must be declared and opt-in, ex., GM OnStar data used by insurance companies.
 - Virtual Reality (VR) simulations used to validate systems must be statistically proven.
 - Job impacts must be understood, negative and positive.
 - Look at road design to support safety technologies and human drivers.
- What areas of study or research are needed by the state?
 - Review state statutes that might prevent adoption of safety and freight technologies.
 - All issues discussed here should be researched, many with federal support due to national issues. Create pilot areas to start with.
 - Fiber optic and cell coverage for technology support and equity.
 - National freight corridors should have multimodal freight analysis.
 - Add AV and artificial intelligence tech to other corridors like electric vehicle corridors being developed.
 - Audit what tech we have in place vs what is needed.
 - Survey companies to learn what it will take for them to trust or invest in AV and ADAS technologies.

Report-out of small group discussions

Each small group was asked to share main takeaways and highlights from the WAVE meeting and the small group discussions.

Table 1 highlights:

- Most freight travels less than 250 miles. AV growth may be local up to 250 miles. Be intentional with investments.
- Recognize economic optimization – understand full Return On Investment (ROI) and appropriate level of investment.
- Technology is at the bleeding edge. Lab experiments are easy, deployment is difficult and expensive. Determine appropriate deployment rate with respect to economic optimization.
- Need more private public partnerships. Private investments will support corridors that are beneficial to them.
- Need long-term investments, holistic infrastructure investments.
- ALL modes of transportation need to be at the table – reduce “competition” between truck/rail.

Table 2 highlights:

- Policy uniformity with neighboring states is important to not confuse or disrupt freight movement. Impact of changing laws at state lines is significant. Need guidance from federal government.
- Security of data is very important.
- Data sharing- a lot of data is collected – need to know how it is being used and how to secure it.
- Stakeholders should encourage acceptance of technology through public demonstrations of the technology.

Table 3 highlights:

- A permit system would need to determine if it set route-by-route or covers travel statewide.
- Need for public buy-in concerning safety and privacy balanced with public company needs and operations.
- Technology needs to be 10 times safer than a human driver or there won't be public buy-in.
- Safety growing pains will occur with “different” types of driver infractions and distorted reporting of incidents.
- Need for infrastructure connectivity to be there and fully operational with redundancies.
- Wear and tear on vehicle technology and roadway status should be accounted for.

Closing Remarks – WisDOT CAV Lead, Brad Basten, thanked the members for their time and presenters for their support in shaping this spring 2024 WAVE Advisory Committee meeting. The insights and expertise provided during this meeting and our previous meetings is helping to shape policies around a complex issue with many stakeholders and it is deeply appreciated by WisDOT.