

**Wisconsin Automated Vehicle External (WAVE) Advisory Committee
Meeting Minutes**

**March 17, 2021 9:00am-12:30pm and March 18, 2021 9:00am-12:30pm
- Meeting Held Via Video Teleconference -**

WAVE Members Present: Eric Anderson, Steve Caya, Tina Chitwood, State Representative Dave Considine, Jerry Deschane, Dan Fedderly, Rob Fischer, Josh Fisher, Paul Fontecchio, Glenn Fulkerson, Chris Hardy, Art Harrington, Nathan Houdek, Debby Jackson, Nick Jarmusz, Luke Junk, Shree Kalluri, Neal Kedzie, Mike Koles, Jeff Lewandowski, Ray Mandli, Dr. Henry Medeiros, Steven Michek, Kevin Muhs, Nick Musson, Jennifer Neugart, Dr. David Noyce, Damon Payne, Alexander Pendleton, Jeff Peterson, Adonica Randall, Matt Regnier, Brian Scharles, State Senator Jeff Smith, Stephanie Sward, Dr. Yang Tao, Tom Wagener, Mary Wolf

WAVE-Member Organization Proxies Present: Andrea Bill, Daniel Holt, Edwin Rothrock

Guests: Justin Kimura, City of Grand Rapids
Mayor Cory Mason, City of Racine
Todd Mulvey, Forest County Potawatomi Community / Inter-Tribal Task Force

Wisconsin Department of Transportation (WisDOT) Staff Present: Stephanie Arduini, Brad Basten, Allison Blackwood, Hannah Brown, June Coleman, Jim Donlin, Tracy Drager, Alex Gramovot, Don Gutkowski, Jackie Irving, Mike Kessenich, Rudy King, Mark Knickelbine, Elizabeth Lloyd-Weis, Reed McGinn, Merrill Mechler-Hickson, Jennifer Murray, Joel Nilsestuen, Stacey Pierce, Josh Reed, Ethan Severson, Aileen Switzer, Craig Thompson, Matt Umhoefer, Kaleb Vander Wiele, Chuck Wade

March 17, 2021

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

Secretary Thompson welcomed Committee members to the meeting, stating we “cannot overstate the value of this Committee” to WisDOT. He noted the ongoing advances in connected and automated vehicle (CAV) technologies, and that the biggest challenge for governments and the business community is the coordination to implement those technologies. Secretary Thompson closed by expressing appreciation for the members’ commitment and expertise that they bring to the group.

- **Meeting Overview, Recap of 1st WAVE Meeting, and WisDOT CAV Strategic Plan**
 - Aileen Switzer, Division of Budget and Strategic Initiatives (DBSI) Administrator

Ms. Switzer welcomed the attendees and provided an overview of the meeting agenda. She reviewed the September 2020 WAVE Advisory Committee meeting and noted that meeting had been covered by both Wisconsin media and the national transportation press.

Ms. Switzer highlighted [WisDOT’s CAV Strategic Plan](#), published in January 2021, which incorporates guidance and recommendations from both the WAVE Advisory Committee and the Mid America Association of State Transportation Officials (MAASTO), and will guide department efforts.

- **Introductions**
 - Matt Umhoefer, DBSI
 - WAVE Members

New members introduced themselves, their organization, and why they joined the Committee.

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

Six Committee members - AAA-The Auto Club Group, ITS Wisconsin, Mandli Communications, Roadview, UW-Madison TOPS Lab, and WI ACES - provided an update on their recent CAV-related activities.

- **Panel - CAVs: Challenges and Opportunities for Local Governments and Tribal Nations**
 - Facilitator: Merrill Mechler-Hickson, Division of Transportation Investment Management
 - Panel Members:
 - Jerry Deschane; Executive Director, League of Wisconsin Municipalities
 - Paul Fontecchio; Highway Commissioner, Brown County
 - Mike Koles; Executive Director, Wisconsin Towns Association (WTA)
 - Stephanie Sward; Civil Engineer, City of La Crosse
 - Todd Mulvey; Roads Program Manager, Forest County Potawatomi Community (FCPC) / Vice-Chair, Inter-Tribal Task Force

Mr. Deschane presented the perspective of municipalities statewide. In general, he stated local public works officials are not thinking about CAVs. Those that are thinking about CAVs are asking who will set standards, when will CAVs be available, and who is going to pay for the related infrastructure. Mr. Deschane surveyed 300 municipal public works directors from throughout Wisconsin about CAVs and received 38 responses. Given the small number of responses, Mr. Deschane stated WisDOT and the WAVE Advisory Committee have a public communications challenge. Mr. Deschane concluded by stating local transportation budgets are not only insufficient for current needs, but that the introduction of CAV-related infrastructure is perceived as exacerbating that challenge.

Mr. Fontecchio's presentation began with the results of a survey he sent to the Brown County Board of Supervisors. Out of 26 questionnaires sent, he received 9 responses, potentially indicating lack of interest in CAVs. Mr. Fontecchio suggested that when major projects are examined, CAV infrastructure should be under consideration for inclusion. He said while education, legislation, infrastructure preparation, and design standards are important for CAV preparation, when it comes to the public and local officials, the most important thing is "real life/tangible" experience with CAVs. Mr. Fontecchio highlighted automobile technologies developed over time, each of which he noted (1) improved safety, (2) increased automation, (3) was met with resistance, and (4) was not driven by local governments. In closing, he said CAVs will probably be advanced by the auto industry and that CAVs will require federal and state leadership to be introduced successfully.

Mr. Koles said his presentation noted many of the same comments as Mr. Deschane and Mr. Fontecchio. In a survey of WTA Board of Directors and Legislative Advocacy Committee members, out of 21 people

only 1 person responded, suggesting CAVs were “not on the radar”. Mr. Koles noted a series of questions in the vehicle-to-infrastructure (V2I) area, including:

- Who pays for, installs, and maintains the infrastructure?
- What happens if there’s short- or long-term damage to town-owned infrastructure?
- Who’s liable if there’s an accident tied to a V2I technological failure?

Mr. Koles also highlighted a series of broader questions, including:

- How will level 4 and level 5 automated vehicles (AVs) respond to inclement weather?
- How will criminal elements make use of AVs?

Ms. Sward opened by providing background information on the City of La Crosse, including that it is a transportation hub. She proceeded to highlight challenges that CAVs will present La Crosse, including:

- Workforce expertise; staff need to be generalists, thus it is difficult to master specific disciplines
- Funding levels
- Existing utilities- space is often limited underground
- Age of existing signal infrastructure, which may make integration with new technologies difficult
- Regulations, such as an existing Fire District or named location of historic significance

Ms. Sward then pivoted to opportunities, including existing funding sources that support deployment of intelligent transportation system (ITS) infrastructure. She closed by noting that public acceptance, including that of elected officials, can be either a great opportunity or a large challenge.

Mr. Mulvey thanked WisDOT for including Tribal Nations on the panel and for inviting Tribal representation on the Committee. He described the Inter-Tribal Task Force, a partnership of 11 Tribal Nations and state and federal agencies that exists to consult together on the advancement of safe and effective transportation systems. Mr. Mulvey highlighted the numerous federal, state, and local agencies that the FCPC works with to maintain road networks on Tribal lands and said those relationships are critical, as roads maintained by those entities often provide access to Tribal lands. Mr. Mulvey highlighted the safety concerns of Tribal communities, including that roadway departure is a factor in 63% of motor vehicle fatalities in Tribal areas. He noted that the technological improvements CAVs are expected to offer may help mitigate that problem, as well as to help with intersection safety. Mr. Mulvey recommended that when conducting outreach, WisDOT educate and empower Tribal governments to convey information about CAVs to their members. He closed by asking, “How can we help?”

- **Budget Update**

- Jim Donlin, DBSI

Mr. Donlin provided an update on the biennial budget process, indicating that the Governor’s 2021-2023 Executive budget was submitted to the legislature in mid-February, and that there would be budget hearings throughout the state in April. The budget requests \$7.12 billion in revenues from all funding sources and would appropriate \$7.03 billion in spending across state highways, local programs, debt service and reserves, and WisDOT state operations. The budget request includes \$5 million for electric vehicle infrastructure.

- **Legislative Update**

- Josh Reed, DBSI
- Kaleb Vander Wiele, DBSI

Mr. Reed highlighted the U.S. DOT's release of, and request for comment on, its *Automated Vehicles Comprehensive Plan*. He shared the *Comprehensive Plan's* goals and noted the opportunity for Committee members to comment.

Mr. Vander Wiele explained WisDOT's goal of being positioned to responsibly react to emerging CAV technologies. He confirmed there are no statutes prohibiting AVs on Wisconsin's roads and that highly automated vehicles can be registered and operated if there is a human in the driver's seat with a valid driver license. WisDOT is focusing on four critical areas: (1) registration, (2) liability, (3) operation, and (4) governance, including how state law interacts with local ordinances.

- **Small Group Discussions and Report Out**

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

1. *What are the greatest challenges for local governments/Tribal Nations with regard to getting their transportation systems ready for CAVs?* Main themes included a need for more funding, including for technical support; a need for more clarity on what needs to be done and who is responsible for doing it; and a need to communicate about CAVs and the benefits they are expected to bring.
2. *What can state government do to help solve those challenges?* Main themes included providing communication and educational materials; providing clarity on who will be responsible for investments and CAV-related operations; and finding new revenue for local governments, either by increasing state aid or by modifying local jurisdictions' taxing authority.
3. *Are there jurisdictional or programmatic changes that could be considered to help implement CAV technology at the local level?* Main themes included a need for regional funding mechanisms; development of road design standards that support CAV technology; and a need for statutory consistency and technology-neutral regulations.

- **Preview of Day 2 and Wrap-Up**

- Aileen Switzer, DBSI Administrator

Ms. Switzer thanked the panelists and presenters for the information they shared throughout the morning, as well as the entire Committee for providing inputs during the small group discussions. She reviewed the next day's topics and ended the day's proceedings.

March 18, 2021

- **Welcome and Review of Day 1**
 - Assistant Deputy Secretary Joel Nilsestuen

Assistant Deputy Secretary Nilsestuen opened Day 2 by thanking attendees for their contributions. The biggest takeaways from Day 1 seemed to be that many local officials are not thinking about CAVs and that state government can play a key role in outreach to explain CAV technologies and their applications. He closed by noting WisDOT is committed to introducing CAV technologies safely and for the benefit of all.

- **Connect 2050 Update**
 - Alex Gramovot, DTIM

Mr. Gramovot explained that *Connect 2050* sets the vision and goals for how WisDOT foresees our transportation system developing over the next 30 years. The plan is designed to identify “the what”, not “the how”. Public involvement efforts have been ongoing with many notable topics emerging from those efforts, including interest in CAVs. WisDOT is currently summarizing the public involvement efforts. The department will determine whether existing policies need to be modified or if new policies need to be developed. After that, WisDOT will write the plan and supporting materials, conduct a second round of public involvement, and adopt the final version of *Connect 2050* later this year.

- **WisDOT Connected Vehicle (CV) Pilot Update**
 - Don Gutkowski, Division of Transportation System Development

Mr. Gutkowski indicated a lot of his team’s work directly supports the goals envisioned for *Connect 2050*- flexibility, adaptability, and interoperability. He noted the majority of crashes today are related to intersections, roadway departures, and work zones. In the near term, ITS infrastructure and connected vehicles can help reduce crashes at intersections, and that one crash avoided more than pays for the installation of the infrastructure. Mr. Gutkowski indicated the potential for WisDOT to partner with a county on a pilot to better understand how use of an automated truck-mounted attenuator could benefit plowing or painting operations.

WisDOT’s CV pilot, which is designed as one project occurring in Milwaukee County with the potential for activities also in Madison, will help identify needs and challenges associated with interoperability, infrastructure, data management, practices, and policies. In this three phased study, WisDOT completed Phase 1 of the pilot in a laboratory setting in fall 2020. Phase 2 of the pilot, which will run from June through fall 2021, will demonstrate hardware functionality and integration into WisDOT’s existing infrastructure, integrates roadside units (RSUs) at signalized intersections in Milwaukee County. Phase 2 will test both Dedicated Short-Range Communication (DSRC) and Cellular-Vehicle-to-Everything (C-V2X) communication protocols. The current proposal for Phase 3 of the pilot is a partnership with UW-Madison and the City of Madison to integrate with and extend the Park Street “connected corridor” onto WisDOT infrastructure. Mr. Gutkowski invited attendees to provide input on possible funding opportunities that could further support the pilot.

- **Panel - Innovation and CAV Pilots at the Local Level**

- Facilitator: Brad Basten, DBSI
- Panel Members:
 - Dr. Yang Tao; City Traffic Engineer, City of Madison
 - Cory Mason; Mayor, City of Racine
 - Jeff Peterson; Director of Business Development - Autonomous Technology, First Transit
 - Justin Kimura; Assistant Mobile GR Director, City of Grand Rapids

Dr. Tao opened the panel by highlighting Madison's effort to "Build a Smart Madison for Shared Prosperity", an effort that includes (1) intelligent data collection, analysis, and sharing, (2) autonomous, connected, and electric vehicles, and (3) smart infrastructure. Dr. Tao described the Park Street "connected corridor" project, noting it was the first CV infrastructure in Wisconsin. The project includes state-of-the-art traffic signal systems, and is designed to improve safety, mobility, and bus on-time performance, and advance transportation equity. The project utilizes DSRC technology, but given recent Federal Communications Commission decisions, the city realizes it will have to migrate to C-V2X. Dr. Tao said the city's goal is to establish Madison, and Wisconsin as a whole, as the hub for CV and AV activities in the Upper Midwest. He highlighted a 2018 AV shuttle demonstration, which included use of the shuttle by visually impaired residents, to illustrate AV's potential to advance transportation equity.

Mayor Mason highlighted Racine's efforts in the "Smart City" arena. In 2019 Racine competed against over 140 cities from across North America in a "Smart City" competition and was named one of five winners. Racine is trying to build off that win by positioning itself as a 'laboratory' for different efforts, with goals of making more effective, data-driven decisions, enhancing citizen and government engagement, reducing the environmental footprint, providing smart transportation options, enhancing safety, and improving economic development opportunities. Mayor Mason said connectivity is key, and suggested spreading the cost of CAV technology throughout the infrastructure could allow more residents to own an AV or CAV. In closing, Mayor Mason said developing a "Smart City" is a great opportunity for Racine and the city is excited about its partnerships with UW-Madison and Gateway Technical College.

Mr. Peterson opened by noting First Transit is a contract operator of transit services throughout North America. The company is currently partnered with governments on AV shuttle projects in Colorado, Minnesota, and California. First Transit has been involved with AVs for approximately four years, and prior to the three current pilots the company had participated in seven other AV projects. Mr. Peterson highlighted three best practices First Transit has deemed critical to successful pilots:

- Early and continuous communication, both with stakeholders and the community
- Align AV, electric vehicle (EV), and other technology expectations with the project scope, goals, and budget
- Clearly define performance benchmarks

AV projects have evolved, moving from limited duration demonstrations within a couple city blocks to more complex projects that bring significant mobility solutions over longer timeframes.

Mr. Kimura introduced the Grand Rapids AV Initiative as a one-year pilot designed to bring electric AV shuttles to downtown Grand Rapids, MI. The pilot cost approximately \$650,000, which was split between the city, May Mobility, and sponsors. Four AV shuttles, each with a human attendant, operate concurrently on an existing route alongside the city's buses. Local leadership and stakeholders provided strong initial support, helping to minimize opposition to the project. Mr. Kimura highlighted the pilot's purpose and goals, including assessing the barriers and benefits of bringing AVs to Grand Rapids,

understanding how AVs affect mobility for the elderly and people with disabilities, preparing the local community for the effects of AVs, and evaluating infrastructure needs. The AV shuttles prompted many residents to use the city's transit system for the first time, and because of their experiences on the shuttles, residents were inclined to use other aspects of the transit system. The pilot's next steps include shifting routes from the circulator to a route with curb-on-demand services and reaching underserved neighborhoods.

- **Small Group Discussions and Report Out**

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

1. *What role does state government have in supporting local-led CAV pilots/initiatives?* Main themes included funding assistance, potentially through a competitive grant process; facilitation of networking, knowledge transfer and development of best practices; and ensuring pilots support WisDOT's vision and plan for CAVs.
2. *As part of exposing the citizenry to CAVs, what could state government do to incentivize multi-jurisdictional pilot projects?* Main themes included tying pilot funding to regional efforts; helping connect local governments to private sector firms; and prioritizing pilots that address "real-world" problems such as transportation equity, medical transportation, workforce mobility, or congestion.
3. *What types of pilots, either in a single community or multi-jurisdictional, could be created to bring benefits to the non-driver community? What would be needed to make those pilots a reality?* Main themes included bus rapid transit; linking isolated communities to other mobility options; workforce mobility; medical transportation; and something in a university setting.
4. *Are there particular aspects of CAVs and how they might/will affect the transportation system that are important to incorporate into Connect 2050 or other long-range planning documents?* Main themes included focusing on safety benefits of CAVs; providing clarity on data security and use; highlighting the financial and human capital needed to make implementation successful; and discussing how CAVs will affect society and the transportation system.

- **Large Group Discussion - Key Takeaways**

In a "round-robin" format, Committee members shared their key takeaways from the two-day meeting.

- **Closing Remarks**

- Aileen Switzer, DBSI Administrator

Ms. Switzer thanked Committee members, WisDOT staff, and guest panelists for another productive meeting. She commented the discussions brought forth a lot of ideas for WisDOT to consider, some of which may get revisited at future meetings. The next WAVE Advisory Committee meeting will occur in fall 2021.

Appendix A - Summary of Responses to Small Group Questions - March 17

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

1. *What are the greatest challenges for local governments/Tribal Nations with regard to getting their transportation systems ready for CAVs?*
 - Funding shortfalls
 - Lack of clarity on who is responsible for CAV-related investments
 - Experienced personnel
 - Technical knowledge
 - Workforce development
 - We must change from the way we have always done things; CAV-related investments should be seen as investments in the future
 - Tribes have varying responsibilities for roads, so the geographical and cultural impact will vary
 - Lack of legislative clarity on who will lead
 - From the standpoint of equity and need for broad access to mobility, some local governments are excited
 - Lack of clarity on the impact CAVs will have on bicyclists and pedestrians
 - Diversity of needs- urban vs. rural systems
 - Urban roadways are more easily recognized (curbs, standardized)
 - Rural roadways are less well-marked; bringing them up to standard will be expensive
 - General lack of awareness and perception of what is happening at the local and state levels
 - The government and the public have different perceptions of CAVs; without marketing we will have an issue with areas moving at different paces
 - Need a societal shift- there will be an education base that needs to be created
 - Need to recognize the U.S. is not on the frontline; learn from other areas that have been down certain paths
 - More stakeholders should be brought in, and then a formal planning process should take place
 - Education of local officials
 - Broadband connectivity in rural communities
 - Outdated existing infrastructure
 - MUTCD requirement updates need to be implemented (pavement marking, etc.)
 - Coordination between adjacent jurisdictions (Tribal/county/municipal/state)
 - Clarifying exactly what needs to be done; defining the “what” is critical- there is no standard yet
 - Local governments need to be told what to plan for; need a specific step-by-step plan with timelines
 - Jurisdictional responsibilities- who is responsible for infrastructure changes?
 - Don't want to have someone who is not local being responsible for programming lights; becomes more important because of the impacts of artificial intelligence
 - Prioritizing what to address first
 - Includes cyber security, impact on open records laws, privacy issues
 - Local governments may become overwhelmed by technology if a regulatory environment is not in place before CAVs arrive

- Liability concerns for municipalities- who is responsible if CV infrastructure malfunctions and leads to an accident?
- Lack of clarity on when CVs/AVs/CAVs will arrive in large numbers? Should we plan for today, 5 years, 10-20 years?
- Need clarity from automakers on what the infrastructure needs are
 - Cars that are being delivered today were developed 2-5 years ago, so they can safely tell what the car will look like 5 years from now; because infrastructure is designed for 30-40 years, we need to meet in the middle
 - We need to find a way to work together so we ensure we have a functioning system; for example, we need to bring everyone together to determine what happens when a CAV crashes
- Uncertainty regarding AVs' ability to operate in Wisconsin's driving conditions, i.e. bad weather
- Technological shifts- example of DSRC moving to C-V2X; what should we focus on?

2. *What can state government do to help solve those challenges?*

- Change the perception- embrace opportunities before talking about limitations; highlight the improved and more equitable mobility CAVs will bring
- Highlight pilot projects and encourage residents to get out and view CAV activities occurring within the state
 - Create a traveling "roadshow" to take the technology around Wisconsin
 - Broadly publicize "success stories"
- State government needs to put together a team that's empowered to make decisions; promote their efforts so everyone "gets on board"
- Use the Inter-Tribal Task Force as a forum to communicate with Tribal Nations
- Briefing from WisDOT's iCAV on the current status of legislation in Wisconsin
- Elected officials need to be informed about CAV advancements
- WisDOT outreach to local governments- help local officials know what they must do to prepare- standards, expectations, etc....
 - State government should clearly define who is responsible for making changes
 - Guidance regarding upgrading specific roads for CAVs; without guidance there will be a limited appetite address the issue
 - A strategic plan is needed to put this "on the radar" of local governments
 - What is the roadmap and how can we help get out the information? Where are the priorities?
- Providing funding and awareness of the availability of those programs/funds
- Work with the federal government to provide funding opportunities for local communities
 - If you rely on local officials to get grants for CAV infrastructure, you need to provide technical training- help the locals access the funds
- Determine whether Property Assessed Clean Energy (PACE) financing be used to finance infrastructure
- Identify new ways to increase revenues
- Increase opportunities to use Tax Incremental Financing (TIF)
- Vision for the future- provide communication infrastructure/connectivity within ongoing improvement projects
- Investigate how Wisconsin's weather will affect CAVs
- Think about how to restructure WisDOT with a group focused on CAVs

- Determine how the DMV will test drivers who are operating a CAV
- Determine how the traffic incident management center will track and manage CAVs
- State insurance regulatory framework needs to address CAV liability and risk
 - National Association of Insurance Commissioners brings states together for these type of discussions
- Determine if/how legislative updates done to improve safety will affect private sector advancements
- Introduce CAV technology into the state's fleet
- Construction projects should include conduit and fiber
- State government should push the federal government on standardized definitions and infrastructure

3. *Are there jurisdictional or programmatic changes that could be considered to help implement CAV technology at the local level?*

- Develop regional funding mechanisms that don't stop at jurisdictional borders
 - Dedicated funding sources and incentives are important
- Clarify who will pay for the infrastructure, who will own and maintain it, and who will operate it
 - Discussion about jurisdictional responsibilities- clear, understandable, and transparent coordination
 - The state may be able to play a more hands-on role than with traditional infrastructure, but need to be careful to not hand everything over to the state- concerns over "Big Brother" programming the stop lights
- Accept federal funding when it's offered
- Consider need for preemption to ensure widespread implementation of CAV infrastructure
- Ensure a consistent legal framework for AVs across jurisdictions
- Consider developing a "CAV Division" within WisDOT
- Develop road design standards that support CAV technologies and make that available for locals' use
- Find ways to fund a centralized study or development of a plan
- Determine what the security and privacy framework is going to look like
- State and local coordination on implementing pilots; potential for public and private partnership
 - Identify private groups who may want to engage in pilots
- Good economic development strategies will lead to a growing economy, which will lead to more revenues for CAV infrastructure
- Technology-neutral regulations and certifications

Appendix B - Summary of Responses to Small Group Questions - March 18

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

1. *What role does state government have in supporting local-led CAV pilots/initiatives?*
 - Oversight and development of a valid means of proving the technology
 - Develop an overarching framework for pilots
 - Ensure pilots are in line with advancing WisDOT's vision and plan- push for pilots that are of importance and will benefit WisDOT
 - WisDOT involvement would make sure there aren't any statutory requirements/ restrictions
 - Other state entities besides WisDOT need to be involved
 - An executive order to allow CAV testing
 - Possibly develop an online repository to:
 - Encourage and facilitate transfer of knowledge, guidance, and best practices
 - Share data/information that can help mitigate concerns about potential dangers
 - Funding assistance and incentives
 - Levy restraints are a challenge; local governments will struggle to find funding when they can't currently keep up with pavement and bridge maintenance
 - Develop a competitive grant process to support CAV pilot projects; model it after the Small Business Innovation Research program
 - Two-phase program: ideas presented in phase 1, implementation in phase 2
 - State sets goals, priorities, and criteria
 - Provide support for grant applications for federal programs, or apply on behalf of local communities
 - Safety and law enforcement preparation
 - Support communication between federal and local levels of government
 - Adjust the tax structure to encourage use of CAV shuttles, by the business community, to improve workforce mobility
 - Serve as a conduit for networking among "forward-leaning" entities
 - Bring together stakeholders to find and further common interests
 - Consider creating a state sub-agency to act as a clearinghouse to connect industry and jurisdictions; Drive Ohio is an example
 - Work within existing frameworks
 - Use League of Wisconsin Municipalities or Wisconsin Counties Association
 - Develop templates for talking points and contracts to be considered when bringing in a partner
 - Differentiate between a government-owned system and a private CAV service
 - Develop statewide standards/framework for introduction of private CAV services
 - Ensure persons with a disability are part of the planning of projects rather than an afterthought
 - "Transportation is #1 issue for people with disabilities and older adults with lack of access to safe transportation. The community is very excited about this and cannot wait for this to be a reality. Will open up their lives in amazing ways."
 - Focus on a disadvantaged segment of the population to show the advantages of AVs
 - Pilots work best where there is a high-density population- will likely be in a place where there is a high percentage of people who don't have the independence to operate their own vehicles

- Be involved in marketing, education, and awareness; specifically communicate the goals of pilots and initiatives
 - Ensure local officials have the information necessary to grow public understanding
2. *As part of exposing the citizenry to CAVs, what could state government do to incentivize multi-jurisdictional pilot projects?*
- Offer flexibility in state competitive grants to allow units of government to work together
 - Tie funding to regional efforts
 - Incentivize MPOs to work together regionally
 - Create a new grant program with multi-jurisdictional requirements
 - Provide funding or “seed” money
 - Potentially lead a project from the state level
 - Facilitate partnerships with private sector to support local-led CAV pilots
 - Use private investment to help get beyond jurisdictional boundaries
 - State could help identify partnerships with private sector support
 - Bring major corporations into the discussion
 - Exposure leading to profit will incentivize their participation
 - Provide opportunities for the public to ride in an AV- State Fair, Summerfest, etc.
 - Lead a public awareness campaign- invest in public service announcements and outreach to normalize CAVs among the public- the more exposure, the better
 - Leverage a partner with brand awareness
 - Highlight current and past projects- CAVs are already here and are working
 - Prioritize project types that support implementation of CAVs
 - Consider that pilot projects don’t need to be a shuttle in a community- they can be educational efforts as well
 - Ensure the pilots solve real problems
 - Equity access issues can be resolved with the right technology
 - Truck platooning could help with I-90 congestion
 - Disability community is ready and willing to go with a pilot
 - Use a strategic planning process to determine what is “pilot ready” and what is ready to be explored- weather, access, etc.
 - Collaborate with stakeholders to forecast where pilot projects can be
 - Help reduce fears by highlighting CAV benefits
 - Serve as an unbiased partner for jurisdictions considering working together
 - Metro bus route in Green Bay goes through multiple jurisdictions- could learn from how that developed
 - Build underground CAV routes to allay safety fears
 - Learn from Milwaukee’s Deep Tunnels project
 - Partner with The Boring Company?
 - State should have a single point of contact for CAV issues
3. *What types of pilots, either in a single community or multi-jurisdictional, could be created to bring benefits to the non-driver community? What would be needed to make those pilots a reality?*
- Real-world mobility solutions- i.e. proof of concept in an actual transit environment

- Make the best business case- areas where there is an obvious need
 - A strategic plan can help determine this
- Don't go into the discussion with a pre-determined solution. Try work with the groups and be open-minded on the appropriate solutions. Solve the problem not just an engineering equation.
- Bus rapid transit
- Shuttle to link isolated communities to other mobility options
- Workforce mobility
- AV "Road Show"
- Medical transportation in rural areas, or rural areas in general
- Include people with disabilities and the non-driving community
- Tourism opportunities
- Micro transit- fill first-/last-mile gaps in public transportation
- Determine where the ride-sharing community is- people already accept carpooling so they may be more open to using an AV shuttle
 - Aren't carpooling and vanpooling publicly funded? Yes, to some degree.
- The private sector knows that human capital is drawn to the technologies that make up Smart Cities, thus the private sector will recognize they need to be involved
- Work zone safety pilot
- Utilize large events to increase exposure to the technology being used; also, the pilot may decrease congestion at these events
- University settings provide a good opportunity- students may be more inclined to use
- Offer incentives with a fee structure
- Communication is key- we don't want negative perceptions that may come with a pilot
- Coordination with local leaders and local planning commissions will be necessary for success
- Levy caps are hindering municipalities from conducting pilots
- Can TIF districts be used to fund pilots?
- Interest groups, public, and private sector need to build momentum with legislators who recognize CAVs are the future
- Work with local non-profits and/or assisted living facilities
- The National Mobility Equipment Dealers Association is a non-profit trade association that supports vehicles that are adapted for the disabled community- they've moved into some of the EV/AV space already, and likely will be moving towards CAVs; might be able to link with other companies

4. *Are there particular aspects of CAVs and how they might/will affect the transportation system that are important to incorporate into Connect 2050 or other long-range planning documents?*

- CAVs will impact every element of transportation planning
- CAVs will cause a paradigm shift, not be an incremental change
- Best practices on what's needed to get the transportation system ready
- V2X needs/impacts
- How will level 5 AVs impact people with disabilities?
- Can wheelchair accessible CAVs be used as part of the state rideshare program?
- Build connectivity into infrastructure- can't wait for telecom companies to solve the problem
- Focus near-term on safety benefits of AVs
- Impact on land use

- Transportation funding- how to capture societal savings (from reduced human error-caused crashes) and apply to the cause of those savings (CAVs)
- Intersection of EVs and CAVs- both need infrastructure
- Track convergence of EVs, AVs, shared cars
- Potential associated with shared ownership of CAVs
- Insurance companies are crucial stakeholders
- State's rights or access to infrastructure and traffic data collected by vehicles; intellectual property issues- privacy, valuing data
- Clarify whether I can opt out of my data being shared or if it's a condition of purchasing a CAV
- Opportunities for mass transit connectivity in improvement projects
 - Look into MN's flexible traffic demand project/CV data to deploy AV first-/last-mile solutions
- Harmonize AV traffic laws/"rules of the road" across states
- Human capital- need people with the right skills and a "pipeline" to the future
- Need a strategic plan specifically focused on CAVs
- A comprehensive review of possible use cases will be beneficial to track the types of pilots we could create
 - Share with other groups such as fire, police, snowplow community, buses, etc.
- What about marketing? Who is in charge of public perception?
 - Tie in the things that the public relies on
- Need to focus on understanding how we can find revenue sources
 - Get private entities involved to sponsor
- Highlight advantages associated with convoying vehicles
- Changes based on introduction of CAVs- speed differentials, maintenance needs, effect on traffic patterns, etc.
- Define the impact of emerging technology for low-income disadvantaged communities; increase access and inclusion
- CAVS will end up having to function in rural areas and will have a significant impact on rural areas- like how the popularity of cell phones grew
 - People are going to pick the safest vehicles- if CAVs will be those vehicles then society will demand them
- Standards are needed- focus on interoperability
 - Charging stations as an example of the need
- Will people be allowed/have freedom to drive their cars long term? There are messages out there that say no- it should be stated this is not the case to combat inaccurate information