

Governor's Advisory Council on Connected and Automated Vehicles

October 30, 2018

Welcome and Introductions

Charlie Zelle - MnDOT
Christopher Clark – Xcel Energy

Executive Order
Report Outline
&
General
Recommendations

Report Outline

- Executive Summary
- Why CAV is important to Minnesota
- CAV Overview
- State and Federal Roles
- National Trends
 - Overview of Other States' Programs (e.g. California, Michigan, Nebraska)
 - Current Status in Minnesota
- Minnesota's CAV Program
- Council Recommendations
- Stakeholder Process & Subcommittees
- Appendices

Recommendations

- Council Recommendations
- Transportation Infrastructure
- Cyber & Data Security
- Vehicle Licensing, Registration and Training
- Insurance & Liability
- Traffic Regulations & Safety
- Economic & Workforce Development
- Accessibility and Equity
- Land Use and Planning

Key Recommendations

- **Funding** – State and local governments need funding to assess and prepare Minnesota’s infrastructure for emerging CAV technologies, pilot projects, research into CAV to support Minnesota needs, including cyber security measures, work force training, and driver training.
- **Clear Policy** –The Legislature and Executive Branch should take a proactive approach to make it clear that truck platooning and the safe testing and deployment of automated vehicles are authorized in Minnesota, with or without human operators present. The Legislature should authorize the Departments of Transportation and Public Safety to partner together to create a program for truck platooning and the safe testing and deployment of automated vehicles. Statutes must provide statewide consistency while allowing government and industry opportunities to use innovation to solve Minnesota transportation challenges while also coordination with national efforts for uniformity.

Key Recommendations (cont.)

- **Partnerships** - State and local governments need to support collaboration efforts with academia, private industry, and other states, in order to shape national standards, national policies, better understand the infrastructure, data, security, accessibility, licensing requirements to safely operate these vehicles on public roadways. Support participation on national committees and forums within Minnesota to shape these technology advancements.
- **Public Education and Outreach** – Provide statewide opportunities for the public to experience the technology through demonstrations and deployments, offer feedback, and conduct education on the benefits and limitations of the technology.

Key Recommendations (cont.)

- **Leadership** – The Executive Branch and Legislature should:
 - Continue the Interagency Connected and Automated Vehicle Team (I-CAV) designated in the Executive Order, and continue with the Minnesota Department of Transportation as the lead agency. The I-CAV team should be expanded to include other state agencies, local government, and Tribal Governments.
 - Continue the work of the Advisory Council by establishing a Future Transportation Mobility Executive Committee to guide statewide policy and report annually on CAV activities. This committee should include representatives from industry, academia, local units of government, Tribal Governments, and state agencies.
 - Continue stakeholder subcommittees to ensure Minnesotans have a voice in formulating statewide policy on CAV.

Vehicle Registration, Driver Training and Licensing

Subcommittee Recommendations

Tom Henderson, Department of Public Safety

Considerations

- As technology evolves, we need to be able to adapt education, training and licensing. This subcommittee recommends considering data and human behavior factors before making decisions.
- The federal government is responsible for regulating the vehicle and states are responsible for regulating the driver.
- Work with other states for uniformity, especially with interstate trucks and drivers.
- Minnesota laws should be revised to allow for the safe use of fully automated vehicles. No drivers' license should be required when there is no human control of the vehicle. Remote drivers licensing and training will need to be considered.

Recommendation 1: Driver's Education Partnerships

- Partner with industry to collaboratively develop driver education, training and testing materials for a statewide curriculum designed for buyers and end-users.

Recommendation 2: Driver's Licensing

- Only require driver's license to operate highly automated vehicle *if* automated vehicle is capable of being driven by a human operator.
- Do not require a driver's license for a level 4 or 5 *if* a human operator cannot operate the vehicle.

Recommendation 3: Licensing and Registration

- At this time, do not require special license plates or branded vehicle titles.

Recommendation 4: Testing Permits

- There should be one lead agency responsible for approving testing in Minnesota. DPS and MnDOT should partner together (similar to overweight vehicles and limousine permits) to safely test and deploy CAVs.
- Authority to test should be granted thru a central permitting process, for a designated time period, with qualified human drivers.

Recommendation 5: Accessibility & Equity

- CAV testing in Minnesota should include the perspectives of people with disabilities, aging populations, and other Minnesotans who may not qualify for a driver's license.
- Manufacturers should reach out to these communities when testing CAVs.

Recommendation 6: Research & Funding

- Need to research how users, driver training programs, vehicle examiners will understand and use this technology.
- Need funding for this research.

Questions & Discussion

Tom Henderson

Program Director, Vehicle Services

Department of Public Safety

Dawn Olson

Division Director for Driver and Vehicle Services

Department of Public Safety

Insurance & Liability

Subcommittee Recommendations

Alison Groebner, Department of Commerce
Vicky Rizzolo, American Family Insurance

Subcommittee Goal

To ensure Minnesota insurance laws and regulations are responsive to connected and autonomous vehicle (CAV) technology to allow for innovation in the development of products and services while providing adequate protection for Minnesota families and businesses.

Insurance & Liability Subcommittee Themes

- AV Data
- Minimum Insurance Liability Limits
- Consumer Education
- Potential Changes to Minnesota Insurance and Liability Laws
- AV Safety Laws
- New AV Insurance Products and Services

Recommendation 1 – Continue the Insurance and Liability Working Group

- The Insurance & Liability Working Group does not recommend insurance or liability statute changes for the 2019 Session.
- Current Minnesota automobile insurance and liability laws provide the necessary protection for Minnesotans based on current levels of automated vehicle technology.
- Minnesota should continue the Insurance & Liability Working Group to study these issues as automated vehicle technology develops and deployment of fully automated vehicles in Minnesota becomes a reality.

Recommendation 2 – Adopt Insurance Minimums for Testing of AVs

- If Minnesota approves the testing of connected and automated vehicles, the Legislature should adopt a mandatory, minimum liability limit applicable only to the testing (versus deployment) of autonomous vehicles. The entity conducting the testing should be required to provide proof of financial responsibility in a manner specified by the Department of Commerce.
- Minnesota should consider adopting a minimum financial liability limit of \$5 million per occurrence. \$5 million per occurrence is in line with seven other states (Colorado, California, Nevada, New York, Massachusetts, Connecticut and Tennessee) that explicitly allow for the testing of autonomous vehicles.

Recommendation 3 – Adopt Consistent AV Definitions

- Consistent with other subcommittees, the Insurance & Liability Subcommittee recommends consistent statutory definitions for key AV terms like:
 - Driver
 - Operator
 - Owner
 - Automated vehicle
- Minnesota should look to adopt established by the National Highway Traffic Safety Administration (NHTSA) to ensure uniformity among neighboring states.

Recommendation 4 – Address Data Access Management Issues

- The Insurance & Liability Subcommittee recommends Minnesota address data access, data ownership, consent around the use of data and the cost and responsibility of data preservation going forward.
- Minnesota will also need to determine the applicability of the Minnesota Government Data Practices Act including necessary disclosures and consumer consent.

Recommendation 5 – Encourage Consumer Education Partnerships

- As AV technology develops, consumers will need access to information relating to insurance, liability, driving safety and other issues.
- Minnesota should encourage partnerships among stakeholders, including vehicle manufacturers, insurers, the Department of Commerce and other government agencies to prepare and educate consumers on the impact of automated vehicle technologies.

Recommendation 5 – Facilitate an Insurance Environment that Anticipates the Development of AVs

- Minnesota will work in partnership with the insurance industry as AV and other technology evolves.
- Minnesota remains open to new insurance products and services that will develop as automated technology develops. These insurance products will be needed to protect Minnesota families and businesses.

Thank you

Co-Liaisons

Alison Groebner, Department of Commerce

Vicky Rizzolo, American Family Insurance

Break / Networking

Land Use & Planning

Subcommittee Recommendations

Frank Douma, University of Minnesota
Mark Nelson, Department of Transportation
Emily Smoak, Department of Health

Subcommittee Considerations

Recognizing that while transportation infrastructure planning occurs at all levels of government, the authority for land use planning largely resides with local and regional government.

Consequently, these recommendations are offered as overall values and principles to guide local land use and planning discussions.

General Themes

- Transit and ridesharing
- Parking
- Bikes and pedestrians
- Freight
- Social/environmental impacts
- Taxes and funding
- Equity
- Mobility for all
- Great Minnesota/urban core
- Mixed fleet
- Insurance
- Pricing
- Weather conditions
- Privacy
- Human impacts

Recommendation 1

- **Education:** Encourage greater buy-in by providing the public with information of the benefits and risks regarding CAV, beginning the installation of CAV infrastructure that can offer current benefits for connected vehicles and successful public demonstrations of CAV.

Recommendation 2

- **Equity:** Standardize quality of service for all users. Require a certain percentage of ADA compliant vehicles. Provide infrastructure and service in all areas of Minnesota

Recommendation 3

- **Role of the State and Local Government:**
Maintain current delegation of powers between the state and local governments regarding land-use and other local planning powers.
- Local innovation should be allowed and encouraged, so long as traditional public interests (health, safety, welfare, choice) are protected.

Recommendation 4

- **Infrastructure Planning:** Increase public well-being through “people-focused” system design and investment that supports all users and all modes.

Recommendation 5

- **Values:** The State should establish a clear set of values and objectives to guide CAV policy development and investment priorities.

MPO Recommendations

- The Legislature should proceed slowly with passing any new laws governing CAV development.
- Funding is the most important piece right now - for pilot projects or grants to communities and public transit providers to implement innovative programs related to shared mobility and CAV development.
- Bi-state MPO's will require coordination at the statewide level with neighboring state governments (Duluth/Superior, Grand Forks/East Grand Fork, Fargo/Moorhead, La Crosse/La Crescent).
- State and MPOs should collaborate on technical assistance, information sharing and best practices. Land use planning and implementation happens at the city/local level but most small cities will not have capacity and expertise to keep up with CAV and land use impacts. MPOs and State need to be well-coordinated and have a structure in-place to provide technical assistance and share best practices.

Thank you

Frank Douma, University of Minnesota
Mark Nelson, Department of Transportation
Emily Smoak, Department of Health

Revenue

Subcommittee Recommendations

Commissioner Cynthia Bauerly, Department of Revenue
Randy Sanford, Department of Revenue

Recommendation 1: Revenue Working Group

Create public-private working group to conduct a comprehensive review of current and future revenue structures for transportation and make recommendation about how to diversify and supplement transportation funding for Minnesota.

Recommendation 1: Revenue Working Group

The CAV Revenue Working Group should consider:

1. **CAV infrastructure needs and assets** including timelines for CAV adoption and deployment
2. Current revenue available to the state and local systems including: **constitutional considerations** for dedicating “motor fuel”; general fund dedication of **auto part sales tax**; **gas tax**; **MVST**; **registration fees**; widely adopted **½ cent tax available to counties**; among others
3. **Options for diversifying and supplementing the existing revenue structures** with attention to **administrative efficiency** including **mileage based user fees** and options being deployed in other states
4. Opportunities for future revenue structures to create **accessibility and equity** across MN
5. **Greater Minnesota** opportunities for CAV around transit and **cost impacts for local government**
6. **Data** to understand transition from current revenue structures to new structures; **pilots with fleets** to collect data on distance-based fees

Lunch Break /
Networking

Accessibility

Subcommittee Recommendations

Myrna Peterson, Mobility Mania
Joan Wilshire, Minnesota Council on Disability

Principle

- A Preamble is needed as to why CAV is so important to under-served populations.
- CAV will allow employment opportunities by providing dependable affordable transportation alternatives and improve the quality of life issues (live, work & play) providing more mobility options in the community of their choice, including urban *and* rural areas.
- These communities are a large, untapped workforce.

Recommendation 1: Regulatory

- No legal requirement for a driver license, wheel, or pedals for Level 4 or 5 vehicles.
- Insurance requirements need to be defined for the development of CAV. Ride share safety incentives need to be granted by insurers to decrease financial insurance rates.
- Require that all vehicles have Universal Design to be fully accessible. This includes physical and software access by the consumer. MN needs to pass this legislatively and push for its adaptation on the federal level. Universal design must include physical space for personal equipment (scooters, wheelchairs, walkers, companion animals) so consumers can enter independently and secure safety mechanisms (tie-downs) within a vehicle. Universal design must also include interfaces for the visual or hearing impaired.
- Define the options for people under guardianship, liability issues, safety for all occupants, or the ability to have a 1+ traveler (to assist the fragile), who covers insurance, who decides safety, spell it out if an escort will be responsible.
- CAV systems will have to be designed to address individuals who have the ability to travel alone (e.g. cognitively disabled, children) versus those who can ride independently/alone.

Recommendation 2: Funding & Incentivizing Equity

- Create a voucher system for easier access to these vehicles funded through legislation via grants/innovative methods.
- Create a variety of financing arrangements to be available for low income populations for public and personal use.
- The cost for transportation be the SAME for able bodied and differently abled consumers.
- Should use public utility/electricity's coop system to ensure that transportation costs do not increase in Greater Minnesota.

Recommendation 3: Testing

- Pilot projects must include both urban and rural/Greater Minnesota, such as Grand Rapids.
- Ensure full accessibility for all disabilities (blind, hearing impaired, developmental, cognitive), that they are all able to prototype test vehicles that they can use and give feedback on the design developments no matter where they live in the state.

Recommendation 4: Public Education & Engagement

- These concepts are so futuristic, we will need a robust education system for users and non-users to increase better interactions.
- Need funding for training and education on how to interact with and operate CAV and direction on what to do in emergencies
- Association peers can work together to suggest equity rules for their population's health, safety, and access to clinics, grocers, employers, and churches with a wider public participation.

Recommendation 5: Shared Mobility

- Create systems for shared mobility equal to a Lyft/Uber, especially in outstate MN. We need a use on demand model.
- Promote ride sharing, alternative fuel use, and group ownership of a vehicle. Match insurance incentives to be based on group ownership than individual use.
- Instead of promoting individual ownership, the State should promote that auto dealerships sell lease shares.
- Increase the number of transit trips. Public transportation has to have density of use to support rural service; fixed routes are no longer needed; less infrastructure is needed, should increase the number of trips. Expand trips beyond city limits and include evenings and weekends.

Recommendation 6: Misc.

- **Connectivity**

- Greater Minnesota needs access to Wi-Fi/or an alternative where Wi-Fi is non-existent.

- **Public Safety & Emergencies**

- We need the ability to call for help by users within the CAV.
- We need the ability for CAV occupants to STOP a vehicle from within, as well as Public Safety authorities (police, fire, 911) to override CAV instructions.
- Code 3, needs CAV to get out of the Way, in other words, CAVs needs to implement priority decision trees before moving/stopping or on/off-boarding consumers.

- **Commerce**

- Should promote the ability to call and order online with CAV (e.g. shop on-line, delivery of medication, grocery, etc. like an Amazon/Walmart). This creates accessibility for all.

Thank you

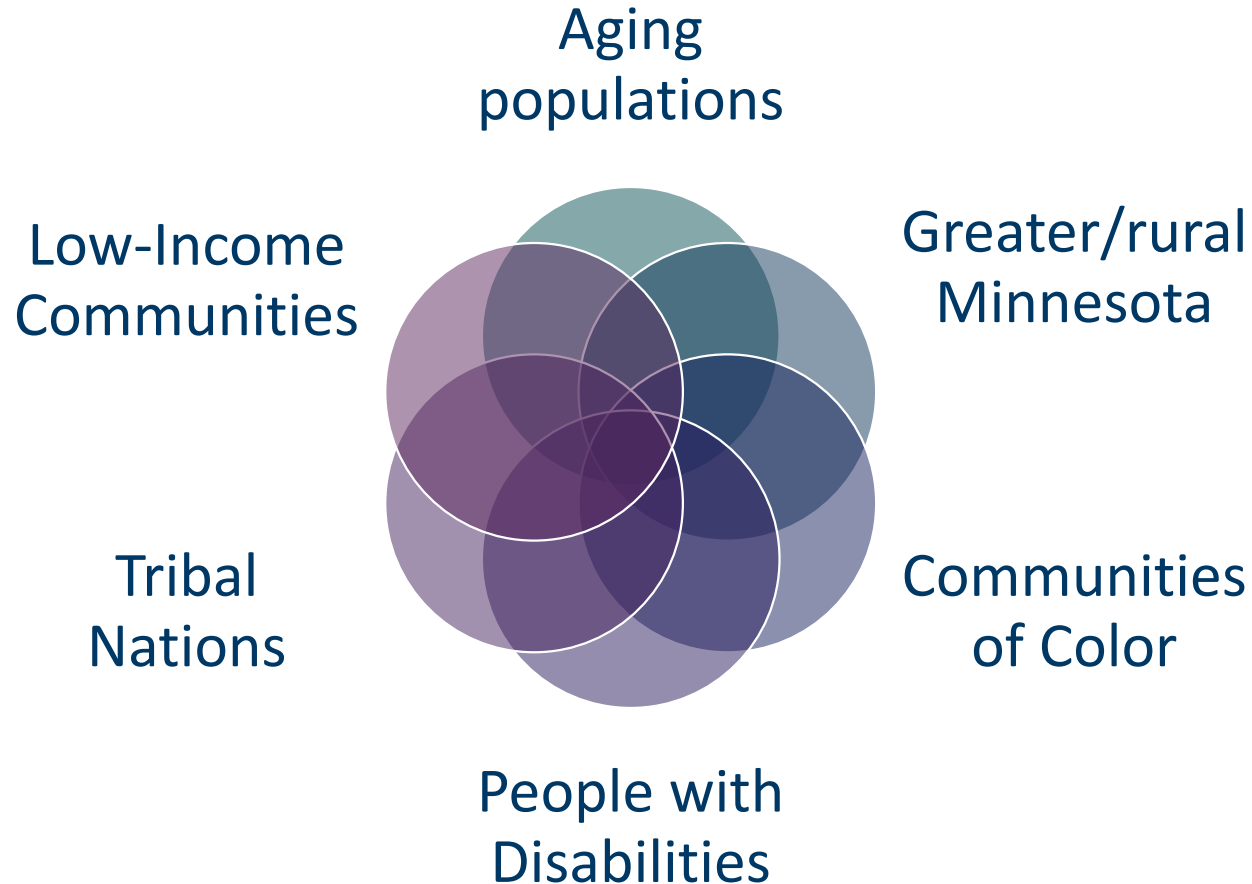
Myrna Peterson, Mobility Mania
Joan Wilshire, Minnesota Council on Disability

Equity

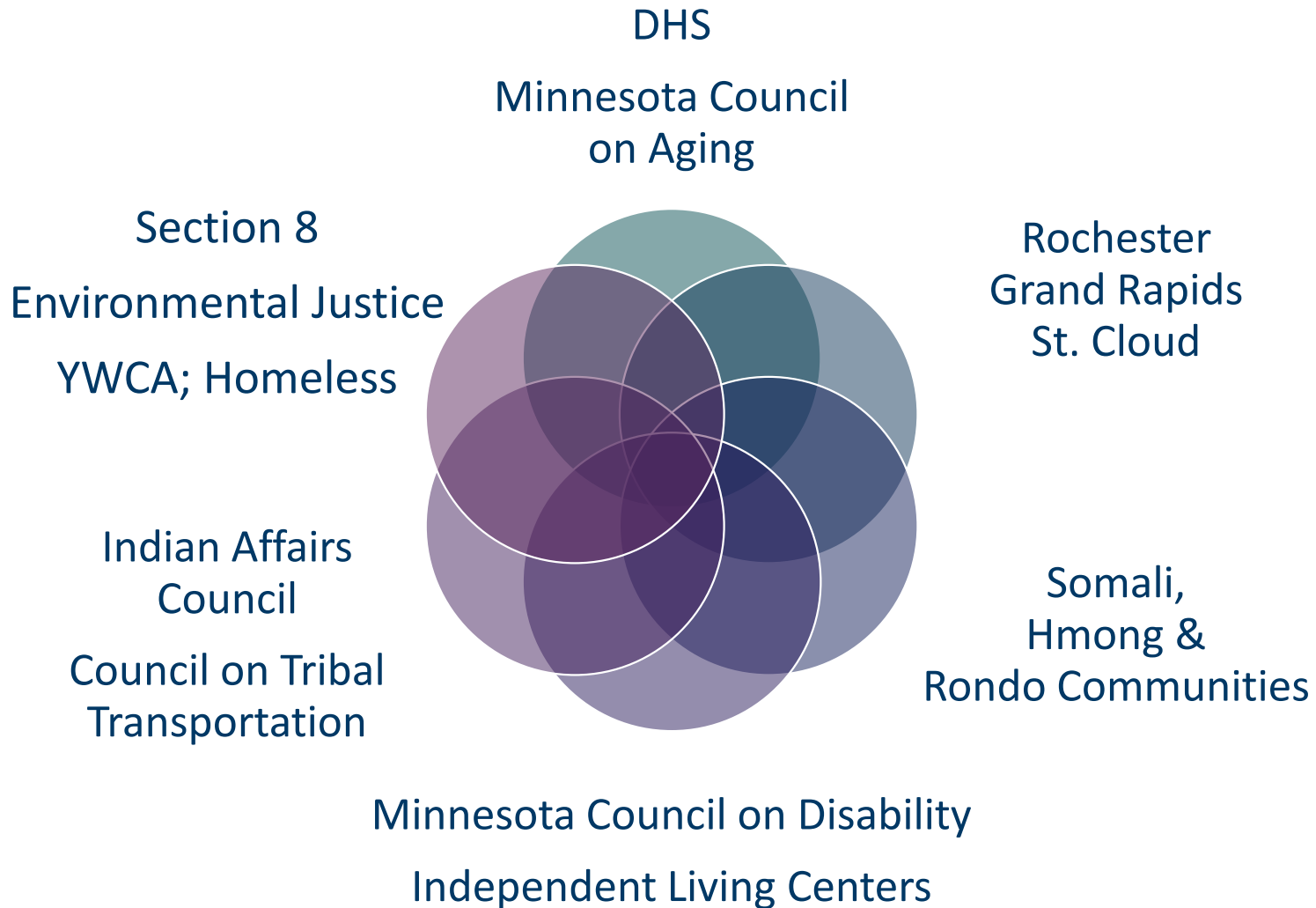
Subcommittee Report and Recommendations

Aimee Gourlay, Minnesota Mediation Center

“Communities experiencing transportation barriers”



“Accessibility and equity for all Minnesotans”



Equity & Accessibility Conversations

- Enhanced process
 - To encourage participation and amplify the voices of people who may not attend “traditional” subcommittee process
 - Accessibility – recommendations developed at three meetings in Roseville, Rochester and Grand Rapids
 - Equity – phone contacts and focused meetings
 - Facilitators made approximately 50 contacts with people from groups “experiencing transportation barriers”
 - "Do you know how many times we've tried to talk with them? They just don't listen." (Rondo community member)
 - Meetings between CAV-X staff and Hmong and Somali communities, tribal governments and aging populations

Hmong Community

- Enact policies for equitable pricing of CAV and TNCs; if pricing is not accessible to low-income populations it could lead to theft, incarceration, and social injustice
- Do not enact policies that create a social/class divide; enact policies that promote equal access
- Recognize that elderly and aging populations have limited income, so must incentivize the use of CAV/shared mobility in these communities to ensure equal access
- Electric charging stations must be installed in rural areas to avoid equity gaps or urban/rural divide
- Need testing and demonstrations in Hmong community and online classes, recognizing that our community needs to see, feel, and touch the technology to learn and understand its importance
- Continue conversations with elders in the community to build public trust and understand what other states are doing

Tribal Governments

- Tribal regulations and state uniformity
- Testing and demonstrations
- Infrastructure & Connectivity
- Training and workforce development
- Continued consultation and coordination

Somali Community

- Trust and equity
- Demonstrations and testing
- Language and accessibility
- Workforce & job training
- Data privacy
- Balance innovation and safety
- Continued conversations and engagement with elders

Aging Populations

- Education and public engagement
- Connectivity
- Urban/rural divide
- Access to technology/shared mobility
- Accessibility by design and coordination with auto industry
- Continued conversations with older adults & caregivers

Facilitators' Recommendations

- Doors which were previously shut have been opened and each community that participated now expects to be included going forward.
- Follow-up is essential in order to build and maintain long-term relationships between participating communities and the State as CAV develops.
- There is willingness and opportunity for real inclusion, and this would definitely require a commitment of resources.
- Listening and integrating these community's wisdom will enable inclusion, participation, and buy-in to happen.
- All communities stressed the importance of including Elders to obtain buy-in of CAV.

Questions & Discussion

Aimee Gourlay, Minnesota Mediation Center

Transportation Infrastructure

Subcommittee Recommendations

Jay Hietpas, Department of Transportation
Mark Krebsbach, Dakota County

Subcommittee Goals

To develop recommendations for changes to statutes, rules and policies in the area of transportation infrastructure for the Governor's Advisory Council on Connected and Automated Vehicles, and assist other Advisory Council subcommittees as needed.

Infrastructure Questions

1. What infrastructure investments should Minnesota make today to support current AV and CV technology?
2. What infrastructure investments should Minnesota consider making to support future AV and CV technology?
3. What infrastructure considerations should Minnesota make to prepare for more electric vehicles?
4. What infrastructure considerations should Minnesota make to prepare for emerging trends in shared mobility?

Policy Questions

1. What policy changes are need to prepare MN infrastructure for CAV?
2. What legislation is recommended to foster AV and CV testing and implementation?
3. What can MN do to foster AV and CV testing and deployment?
4. How can we partner more effectively to prepare our infrastructure for CV, AV and EV?
5. What research should be considered to prepare our infrastructure for CAV?

Attendees

- Transportation Consultants
- Railroads
- State Government
- County Government
- City Government
- Academia
- Technology Industry
- Auto Industry
- Tele Communications
- Coalitions / Alliances
- Freight
- Transit Providers
- Other Private Businesses

Recommendation 1

Infrastructure Standards

Engage in the development of infrastructure standards at the federal level, so national policy accounts for Minnesota needs.

Allow MnDOT to-develop state standards in collaboration with local units of government.

Recommendation 2

Partnerships

- Support partnerships between government, academia, and private institutions to better understand the infrastructure needs for CAV testing and deploying, particular in winter weather conditions and other situations relative to Minnesota.
- Update state procurement processes to allow more flexibility and encourage private investments in rapid developing infrastructure technologies.

Recommendation 3

Infrastructure Investments

Pursue public and private infrastructure investments now in fiber optics, signal system modernization, improved pavement markings, telecommunications (e.g. 5G), and data collection to support emerging CAV technologies

Recommendation 4

Funding

Provide funding to support CAV infrastructure capital needs, operational needs, testing corridors, and public educational/outreach efforts.

Revenue

Identify additional revenue streams to support CAV infrastructure needs beyond current sources, in particular the potential loss in gas tax due to electrification.

Recommendation 6

User Needs

Consider all road user needs (e.g. pedestrians, bicycles, person with disabilities, transit, railroads) when making infrastructure investments for CAV.

Recommendation 7

Data Standards

Develop data standards and centralized systems for sharing infrastructure data (e.g. work zone, traffic signal timing, road conditions) with 3rd parties.

Partnerships (General Deployment)

Identify roles, responsibilities, and liabilities for public and private partners involved with CAV deployment.

Testing & Priorities

Support safe testing of CAV on existing public infrastructure, including truck platooning deployment, based on Minnesota transportation needs and priorities.

Recommendation 10

Electric Vehicles

Support efforts for electric vehicle deployment and associated infrastructure.

Thank you

Co-Liaisons

Jay Hietpas, Department of Transportation

Mark Krebsbach, Dakota County

Executive Order Report & Next Steps

Timeline

Public Survey

Stakeholder and Public Engagement

Tribal Government-to-Government Relations



Draft
Report
Nov. 13

Final
Report
Dec. 1

Final
Meeting
Nov. 27

Thank you

Christopher Clark
Xcel Energy

Commissioner Charlie Zelle
Minnesota DOT