

# Governor's Advisory Council on Connected and Automated Vehicles

September 25, 2018

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# Welcome and Introductions

Charlie Zelle- MnDOT  
Christopher Clark – Xcel Energy

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# National Trends & Minnesota Updates in CAV

Jay Hietpas – MnDOT  
Kristin White - MnDOT

# FHWA National Workshops

Planning & Policy

Digital Infrastructure & Data

Freight (Sep 5 & 6)

Operations (Oct 24 & 25)

Infrastructure (Early Dec)

# Local Motors - Olli



# Public Participation Process Update

- 18 Stakeholder Meetings held / scheduled
- Each group has met at least once
- Public Survey



# State Fair Booth



## Connected + Automated Vehicles

mn DEPARTMENT OF TRANSPORTATION

**Automated Vehicle**  
Use sensors and cameras on vehicles to guide the operation of the vehicle without human intervention.

**Connected Vehicle**  
Communicate with other vehicles and roadside infrastructure using wireless technology.

### Available and Future Automation

Today	Future
<b>Levels of Automation</b> Adaptive Cruise Control, Blind Spot Warning, Automatic Lane Keeping, Park Assist, etc.	<b>Levels of Automation</b> Possible to integrate with infrastructure.

### Types of Connected and Automated Vehicle Applications



### Types of Automated Vehicles

Passenger	Commercial	Transit

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# Public Events – State Fair

1. Would you be comfortable riding in a fully automated vehicle?



27%

64%

2. Would you feel comfortable sharing the road with a fully automated vehicle while walking or riding a bike?



Yes  
37%

Yes  
64%

3. Do you want more automation in your next vehicle?



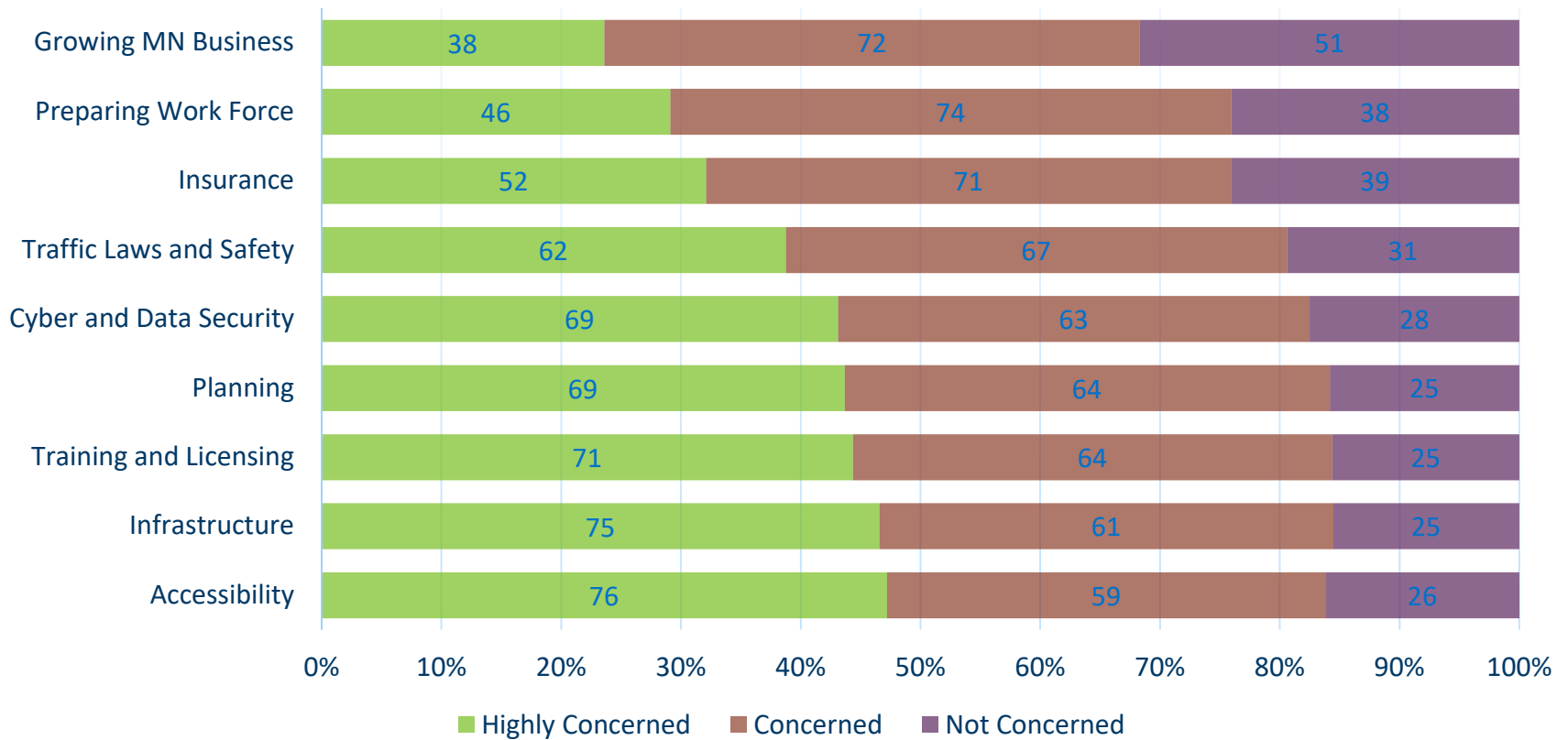
Yes  
55%

Yes  
81%



# State Fair Survey

## WHAT ARE MINNESOTANS' CAV CONCERNS?



# Key Stakeholder Updates

- Freight - Truck Platooning
  - Platooning legislation needed
  - Need designated truck platooning corridors (freeways)
  - Need to assess infrastructure for platooning impacts
  - Maintain infrastructure assets
  - Need national consistency in regulations

# Key Stakeholder Updates

- Freight - Automation
  - Incentives to use this technology
  - Invest in skills to maintain and operate technology
  - Need reciprocity in laws when crossing state lines
  - Driver training in systems
  - Need clear policy on how government will use data
  - Federal government to regulate vehicles

# Car Manufacturers

- No regulation changes for SAE Level 0-2, Level 3 had differing opinions
- Level 4-5, need clear authorization to operate
- Recommended Legislation
  - Alliance of Automobile Manufacturers or Self-Driving Coalition model legislation
  - States: CO, TX, FL, Nebraska, GA, NC, MI, NV, TN
- Heavy regulation will stifle innovation and opportunities
- Infrastructure – maintain system and good pavement markings

# Car Manufacturers

- Be flexible with regulation as technology develops
- Electric vehicles infrastructure, government leadership, & electric rate structure will be important
- Real time access to data (e.g. work zones)
- High insurance requirements will limit start-up opportunities
- Need uniform regulations in the state (state should be the lead)

# MnDOT Updates



## TH 55 Connected Corridor



## Minnesota CAV Challenge

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Executive Order  
Outline & Draft  
General  
Recommendations



# Report Outline

- Executive Summary
- Purpose
- Advisory Council Overview
  - Mission
  - Goals
  - Members
- Stakeholder Process
  - Public Meetings
  - Equity Groups
  - Public Survey

## Recommendations

- General
- Infrastructure
- Cyber & Data Security
- Licensing, Registration and Training
- Insurance & Liability
- Traffic Regulations
- Economic & Workforce Development
- Accessibility and Equity
- Land Use and Planning

# Advisory Council Goals

1. **Brand** Minnesota as a place to test and deploy CAV
2. **Engage the public**
3. **Educate** the general public
4. **Develop actionable recommendations** to facilitate the adoption of CAV in a manner that enhances our quality of life, while providing flexibility to account for evolving technology
5. **Recommend mobility strategies**

# Draft General Recommendations

## Leadership

- Fundamental question



- Statewide leadership
- Advisory Council – next steps
- Continue Stakeholder Groups

# Draft General Recommendations

## Collaboration

1. Provide more opportunities for stakeholders to meet and provide input into future policy decisions.
2. Continue Interagency CAV Team (I-CAV Team)
3. Establish process to continue outreach to accessibility and equity groups and Tribal Governments

# Draft General Recommendations

## Regulatory

- Federal, State and Local Roles
- Shape national and Midwest policy
- Collaborate on interstate travel uniformity

# Draft General Recommendations

## Public Outreach

- Demonstration / Interaction Opportunities
- Surveys and public feedback

# Draft General Recommendations

## Branding

- One stop for CAV information
- Focus not only on technology but human elements





# Subcommittee Report Outs - Process

- During subcommittee report-outs please take note of common themes or items the Advisory Council should prioritize.
- Highlight or underline the themes that are important to you.
- After subcommittee report-outs CAV-X will record Council's thoughts and themes on poster-board.

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# Cyber Security and Data Privacy

## Subcommittee Recommendation

Damien Riehl – Stroz Friedberg

Josh Root – MnDOT

Aaron Call - MnIT

# Considerations

- 1. DEFINITIONS** – The terms currently used in industry, statute, or rule may not align with how people or the law will interpret automated vehicles being driven without human operators.
- 2. CLASSIFICATION** – The Minnesota Data Practices Act's data-classification scheme will impact which CAV data is shared, how it could be shared, and with whom. The state will have to make private data anonymous and understand that this data has significant financial value.
- 3. UNIFORMITY** – Need uniform data storage, collection, and usage amongst industry, states, and world.

# Considerations

4. **SECURITY** – The sooner security protocols are determined, the cheaper they will be.
  - A. Use security industry standards
  - B. Trust and authenticate: Confirm who is providing the data sources and how trustworthy their data is
  - C. Immutability and integrity: Avoiding unwanted challenges
  
5. **PARTNERSHIPS** – Public-private partnerships will be key to leverage industry knowledge to benefit citizens and benefits without minimizing safety

# Considerations

6. **REGULATORY** – In CAV, the government’s role can help foster new development, while protecting the public from risk.
  - A. Address data breaches
  - B. Look to existing standards
  - C. Address how the government would respond in a breach and whether the public has a private right of action
  - D. Public should have to “opt in” to allow the collection, use, or sale of their data
  - E. Consumers must be informed
  - F. Entities must disclose what data is being collected
  
7. **COLLECTION, STORAGE & DISTRIBUTION OF DATA** – Start the process now to determine what data to collect, where it will be retained, and how it will be shared.



## **Recommendation 1:** Definitions

# Recommendation 1A: Definition for 'Driver' & 'Operator'

- **Define Driver & Operator.** Legislature should define “driver” and “operator” to address situations where human is not operating the automated vehicle.
- **Consistent Definitions.** Legislature should ensure that the terms “driver” and “operator” are used consistently among statutes, rules, and policies.



# Recommendation 1B: ‘Personally Identifiable Information’

- **Align with Federal Definition.** The State needs to revise the definition of “personally identifiable information” (PII) to align with federal standards.
- **Need PII Definition.** The State’s definition of PII needs to address *what* private information about a human is being shared — and with *whom* the data is being shared.

# Recommendation 1C: Definition for 'Private Data'

- **Expand 'Private Data' Definition.** Legislature should expand definition of “private data” as it relates to data the government collects about humans who travel in vehicles.
- Understand that the public might not be comfortable with governmental sharing of sensitive data (e.g., pinpoint geolocation, driving habits) that CAVs may collect and communicate.



## **Recommendation 2: Classification**

# Recommendation 2A: Data Anonymity, Summary & Value

- **Anonymization, aggregation & value.** The Minnesota Data Practices Act should be updated to:
  - make private data anonymous;
  - Summarize (or “aggregate”) data so that personal information is not identifiable; and
  - Understand that this data has significant financial value.

# Recommendation 2B: Public-Private Partnerships & Uniformity

- **Partnerships to Collect Data.** The State should investigate public-private partnership (P3) opportunities with industry regarding government-collected CAV data. These P3s should balance potential privacy challenges (or the appearance of privacy challenges).
- **Uniformity & Simplicity.** The Legislature should clarify or set policies around data that would help create both a uniform roadway user experience and simplify data.



## Recommendation 3: Uniformity

# Recommendation 3: Uniformity with Other States

- **Uniformity.** Minnesota should adopt other state, federal, and international best practices, while also considering our state-specific needs, for uniform data storage, collection, and use.





## Recommendation 4: Security

# Recommendation 4A: Security by Design

- **Security Protocols are Critical.** The Legislature must understand that the single most important element of CAV are their security protocols.
- **Security by Design.** The Legislature and developers must emphasize “security by design.” Security is best thought about and integrated early in design, not afterwards.
- **Partnering for Standardization.** The State should avoid choosing a specific technology (e.g., Betamax vs. VHS). Instead, the State should partner with industry around common security standards.

# Recommendation 4B: Security Standards, Trust & Integrity

- **Early Integration Saves Costs.** The State should integrate security in design earlier in order to save costs. The sooner security protocols are determined, the cheaper they will be.
- **Allow for Changing Technology.** The State should invest in security systems that allow for changes in technology.
- **Use industry standards for trust and integrity.** In designing security systems, the State should:
  - Use industry standards for security and electronics
  - Ensure that we can trust the data's creators (e.g., confirm who you are)
  - Ensure that the data is kept safe and is unchanged.



## Recommendation 5: Partnerships

# Recommendation 5A: Partnerships to Engage Public & Increase Safety

- **Partnerships to Advance Safety Benefits.** The State should partner with private industry to:
  - increase the availability of CAV benefits to citizens and businesses, which also addresses equity work; and
  - further enforce Minnesota’s obligations to maintain safety standards.
- **Partnership Incentives.** The State’s policies should incentivize public-private partnerships. Understand that while State standards are minimum requirements, industry should be able to do more — as long as they adhere to these minimum requirements. ■

# Recommendation 5B: Public Data & Mapping

- **Construction & Operations.** Understand that the State has a role in reporting what is being done on roads (e.g., construction, detours), which could impact CAV performance.
- **Infrastructure Capacity.** Understand that certain roads may have higher or lower CAV-capability (e.g., gravel roads vs. paved roads with connected signals).
- **Mapping Data.** The State must recognize that mapping data (e.g., streets, lanes, potholes) may have a variety of sources from government, industry, and private individuals.
- **Staffing & Funding.** The State should staff and fund a system that assesses the reliability of map data and its sources.
- **Research.** Additional research and partnering is required to define the State's role.



## Recommendation 6: Regulatory

# Recommendation 6A: Data Breaches & Existing Standards

- **Look to existing standards.** Minnesota should look to existing state and international standards to clarify its data breach-standards — providing more certainty for business sectors.
- **Government breach response.** The Legislature should clarify how the government would respond in a breach situation.
- **Private Right of Action.** The Legislature should further clarify whether, in breach situations, consumers have a public right of action— instead of allowing this issue to be litigated in courts.



# Recommendation 6B: Consumer Protection

- **Consumer information.** The State should update the Minnesota Consumer Protection Act (MCPA) to enhance requirements for consumer notice and protection.
- **Disclosure.** The Legislature should require government and private data collectors to disclose *what* data the CAV is collecting about people, and why the data is being collected (e.g., traffic flow, road conditions, safety, emissions).
- **Opt-in.** The Legislature should require consumers to opt-in if they want their data shared to help consumers choose what data they are willing to share, and with whom. Opt-in should be required for:
  - collection (likely by OEMs),
  - use (likely both OEMs and trusted suppliers), and
  - sale (controlling who may buy data about people).
- **Fairness.** The Legislature should prohibit service from being degraded if consumers choose not to share their data.



## **Recommendation 7:** Storing, Managing & Collecting Data

# Recommendation 7: Storing, Managing & Collecting Data

- **Collection.** The Legislature should first identify:
  1. what data government needs
  2. for how long, and
  3. what triggers destroying records/data.
- **Storage, format, and necessity.** The Legislature should identify
  1. how to store data,
  2. where to store it, and
  3. whether to collect/store it at all.
- **Distribution.** The Legislature should clarify who has access to data.

# Questions & Discussion

Damien Riehl

Josh Root

Aaron Call

Bill Leifheit

Craig Gustafson

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Break / Networking

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# Economic & Workforce Development

## Sub-Committee Recommendation

Edward Reynoso– Teamsters  
Kevin McKinnon– DEED

# Subcommittee Goal

To formulate and recommend to the advisory committee recommended changes to statutes, rules and policies related to *economic development, labor and business interests* and to address opportunities, impacts and challenges of CAV technology.

# General Themes

- Economic Development
- Business Opportunity
- Workforce Impacts



# Themes

- **Words matter.** Use “automated” not “driverless” or autonomous
- **Inclusion.** Including voices of, and input from, impacted industries and workers is vital
- **Support Minnesota businesses.** Involve and collaborate with *existing* companies
- **Support Minnesota talent.** Employ Minnesota workers
- **Support interstate commerce.** Don’t create barriers for interstate travel & movement
- **Uniformity & reciprocity.** Federal and state uniformity and reciprocity

# Themes

- **Collaboration.** Leverage business opportunities, strengths and cross-disciplinary expertise amongst businesses and industries
- **Education.** Inform and educate the public and legislators
- **Understand CAV impacts.** Understand CAV impacted industries and workers
- **Workforce training.** Educate and train the workforce
- **Financial considerations.** Invest in Minnesota.
- **Interstate travel and movement**
- **Equity, fairness, and impartiality** regarding involvement, opportunities and gains



## Recommendation 1: Economic Development

# Recommendation 1 – Economic Development

- **New CAV industry.** The State should support new industries that use the strengths of Minnesota businesses and technology expertise, especially IT, AI, hardware/software and science.
  - Cross disciplinary/industry knowledge sharing and access
- **Gap analysis.** The State should conduct a gap analysis on which CAV industries are not in Minnesota. It should also identify and capitalize on unique strengths and environment.
- **Public private partnerships.** The State should foster public-private collaborations with institutions including MnSCU and University of Minnesota, organizations, and small business and avoid slowing development of CAV and the related workforce development needs.

# Recommendation 1 – Economic Development

- **State funding.** The Legislature should fund initiatives to support the CAV industry and creating an ecosystem to foster developing products and services for the industry.
  - Physical working environment (access and interaction)
  - Programs, incentives
- **Taxpayer impacts.** The State should consider the cost of CAV development to the tax payer
- **Equity and fairness.** Consider equity, fairness, and impartiality regarding involvement, opportunities and gains – include Greater MN in policy and development decisions.



## Recommendation 2: Business Opportunity

# Recommendation 2 – Business Opportunity

- **CAV testing and deployment.** The Governor & Legislature should establish a framework to encourage collaborative development of the CAV industry, including research, testing and infrastructure.
- **Clear policy.** Make sure industry knows that Minnesota is open for business, understands where testing can be done, and who is responsible for monitoring testing.
- **CAV testing policy.** The State should make it clear whether industry can test CAVs in Minnesota. Don't want state to discourage investment. Need a policy framework to know how/where industry can test and create a standard to balance the need to test with public safety and public engagement;
- **Testing and demos.** The State should partner with industry to conduct safe public testing and demonstrations. Government, citizens, and consumers need to understand CAV is a safety solution.

# Recommendation 2: Business Opportunity

- **Industry partnerships.** State agencies could convene and facilitate conversations for business opportunities and needs, including:
  - Auto/Transit industry OEM's in Minnesota working in the CAV industry;
  - Existing supply chain providers;
  - Related/Adjacent industry supporting automation;
  - Existing infrastructure providers





## Recommendation 3: Workforce Impacts

# Recommendation 3: Workforce Impacts

- **No tradeoffs.** The State should carefully balance economic development with the impacts on the current and future workforce.
- **Foster local talent.** The State should foster Minnesota's workforce, talent, and expertise.
- **Human operators.** The Legislature must require drivers (or operators) in all vehicles until the technology is proven to be safe for the general public. Need driver, operator back-up systems.
- **Driver training and licensing.** The State should develop standards around training, driver requirements, and licensing.

# Recommendation 3: Workforce Impacts

- **Minnesota-based training.** The State should partner to create industry-recognized accreditation programs around CAV technologies in Minnesota to promote innovation and opportunity.
- **Workforce training.** The State should train and rebrand the workforce, and develop apprenticeship opportunities.
- **Develop STEM talent.** The State should develop engineering and technology talent in Minnesota for IT, AI and other science and technology industries. Develop talent early (high schools) and broadly (vocational schools).

# Recommendation 3: Workforce Impacts

- **Federal-state coordination.** Collaborate with federal and state educational and tribal institutions for funding and training programs (e.g. high schools, universities, MnSCU, vocational schools).
- **State training fund.** The State needs to appropriate funding for training. There are some existing programs but need to evaluate how to adapt current programs or create new.
  - Training should include drivers and mechanics.
  - Need to include both public and private educational institutions, e.g. if Teamsters and others in trucking industry create educational programs, they should be able to take advantage of state training programs.

# Thank you

## Co-Liaisons

**Edward Reynoso, Teamsters**

**Kevin McKinnon, DEED**

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Break / Networking

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# Traffic Regulations and Safety

## Sub-Committee Recommendation

Colonel Matthew Langer– MN State Patrol

# Subcommittee Goal

To develop recommendations for changes to statutes, rules and policies in the areas of ***traffic regulation, law enforcement and safety*** for the Governor's Advisory Council on Connected and Automated Vehicles, and assist other Advisory Council subcommittees as needed.



# General Themes

- Safety
- Crash reporting
- Education
- Insurance
- Data
- Testing
- Public education and demonstrations
- Mobility
- Vulnerable road users/situations
- Licensing/driver training
- Platooning
- Continue work groups & conversations

# Considerations

- **Distinguish between Levels 3-5.** Regulations will depend on level of vehicle. Need to distinguish between Level 3, 4, and 5.
- **Technology advancements.** These recommendations will change with advancement of automation.
- **Generational differences.** Need future conversations on how differently generations understand ownership and how they may – or may not – adopt CAV.
- **Training.** Who is responsible for training on technology?
- **Balance regulation with innovation.** The State should regulate and embrace CAV without impeding industry interest in serving our citizens.
- **Uniformity.** Support uniformity and enforceability across various jurisdictions.
- **Reciprocity.** Recognize other state's existing or proposed rules, licenses.
- **Ownership** questions. Who “owns” a CAV? Will this vary by urban or rural differences?

# Recommendation 1

- **Data.** Minnesota needs to determine what, if any, data should be collected specific to CAV.

## Recommendation 2

- **Training and education.** Minnesota should study, review, and revise whether any training for CAV is required

## Recommendation 3

- Minnesota needs public education to build public trust on CAV

## Recommendation 4

CAV technology is going to be helpful for all drivers, and especially vulnerable road users.

# Recommendation 5

- Establish a workgroup to research all laws and regulations related to these issues to determine what, if anything, needs to change.

# Thank you

**Colonel Matt Langer**  
**Minnesota State Patrol**



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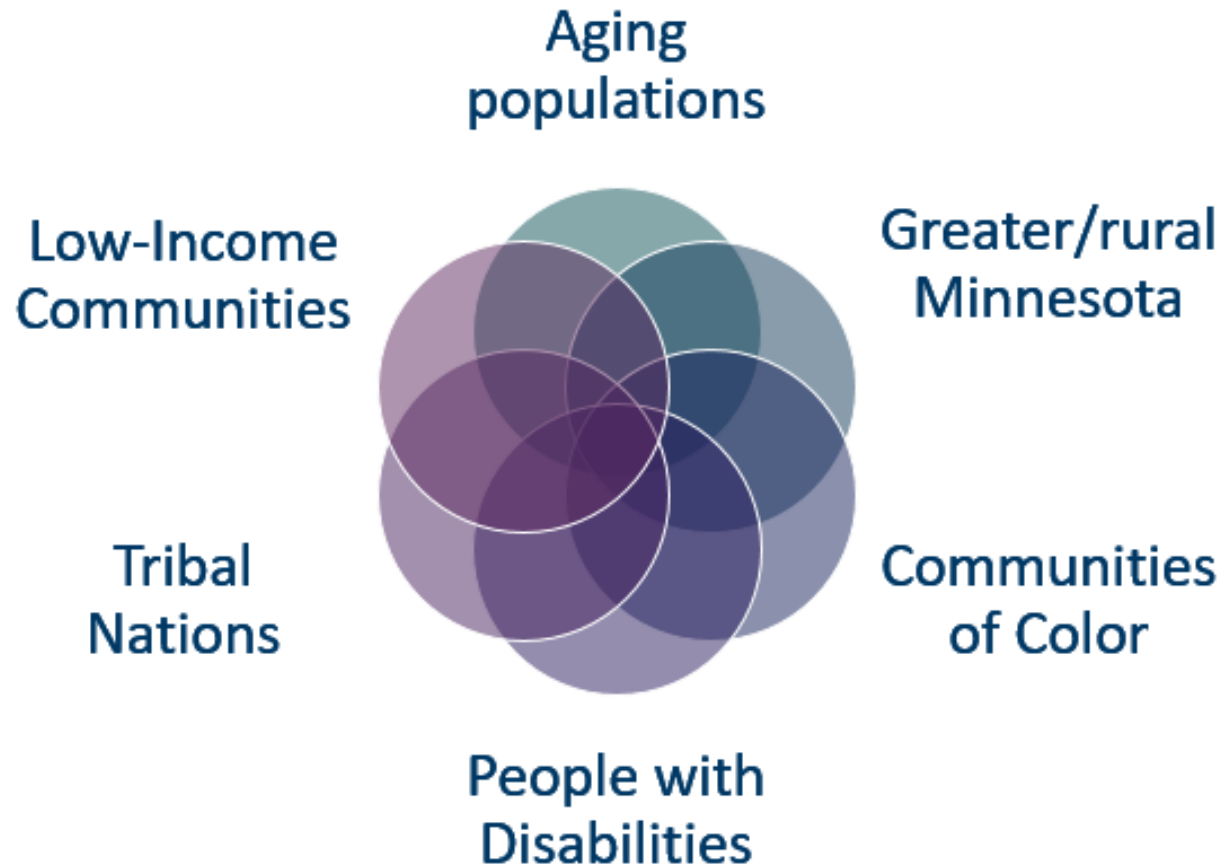
# Tribal, Equity, and Accessibility Updates

Kristin White - MnDOT

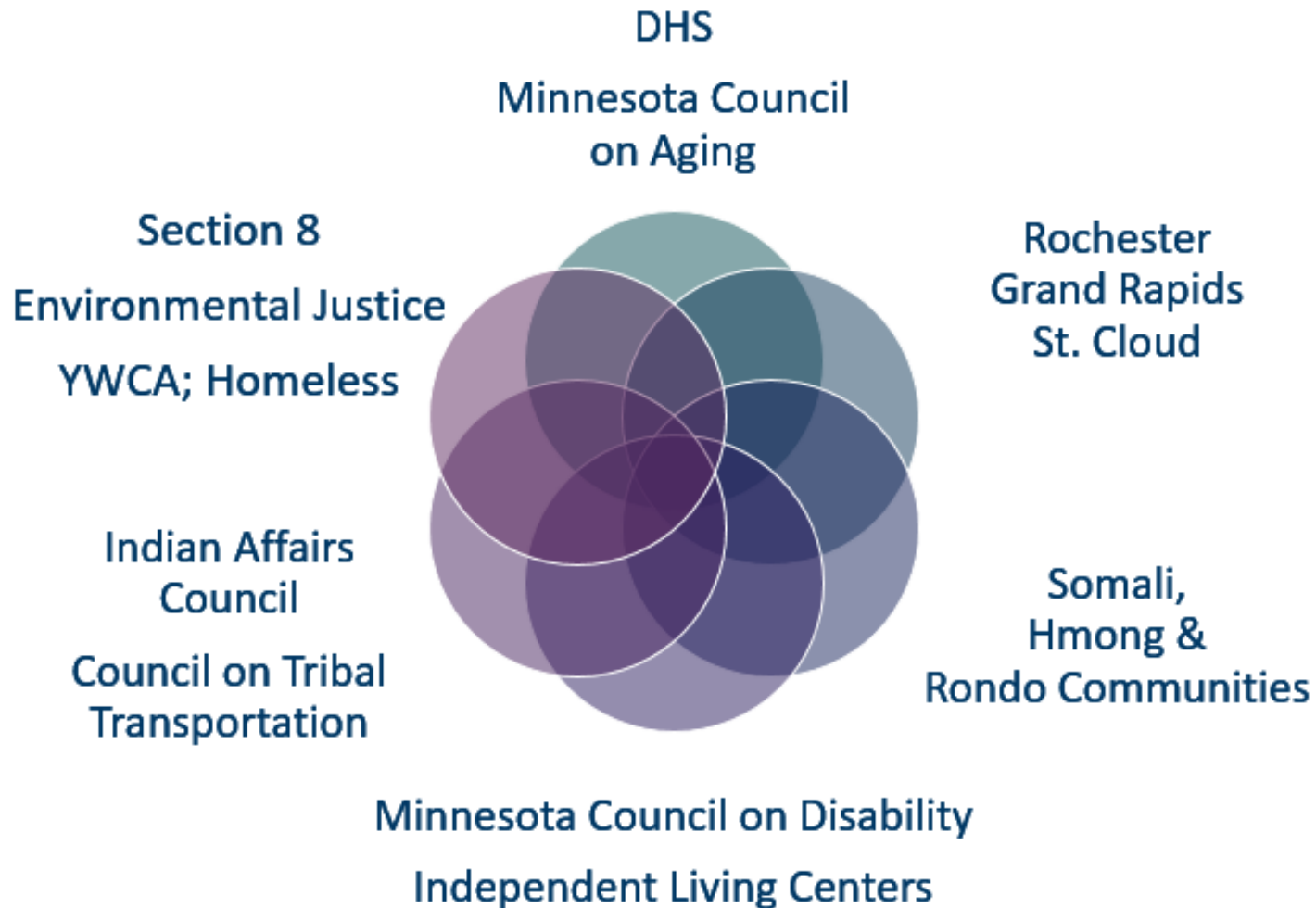
# Governor's Advisory Council on CAV



# *“Communities experiencing transportation barriers”*



# *“Accessibility and equity for all Minnesotans”*



# Public Engagement Opportunities



# 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

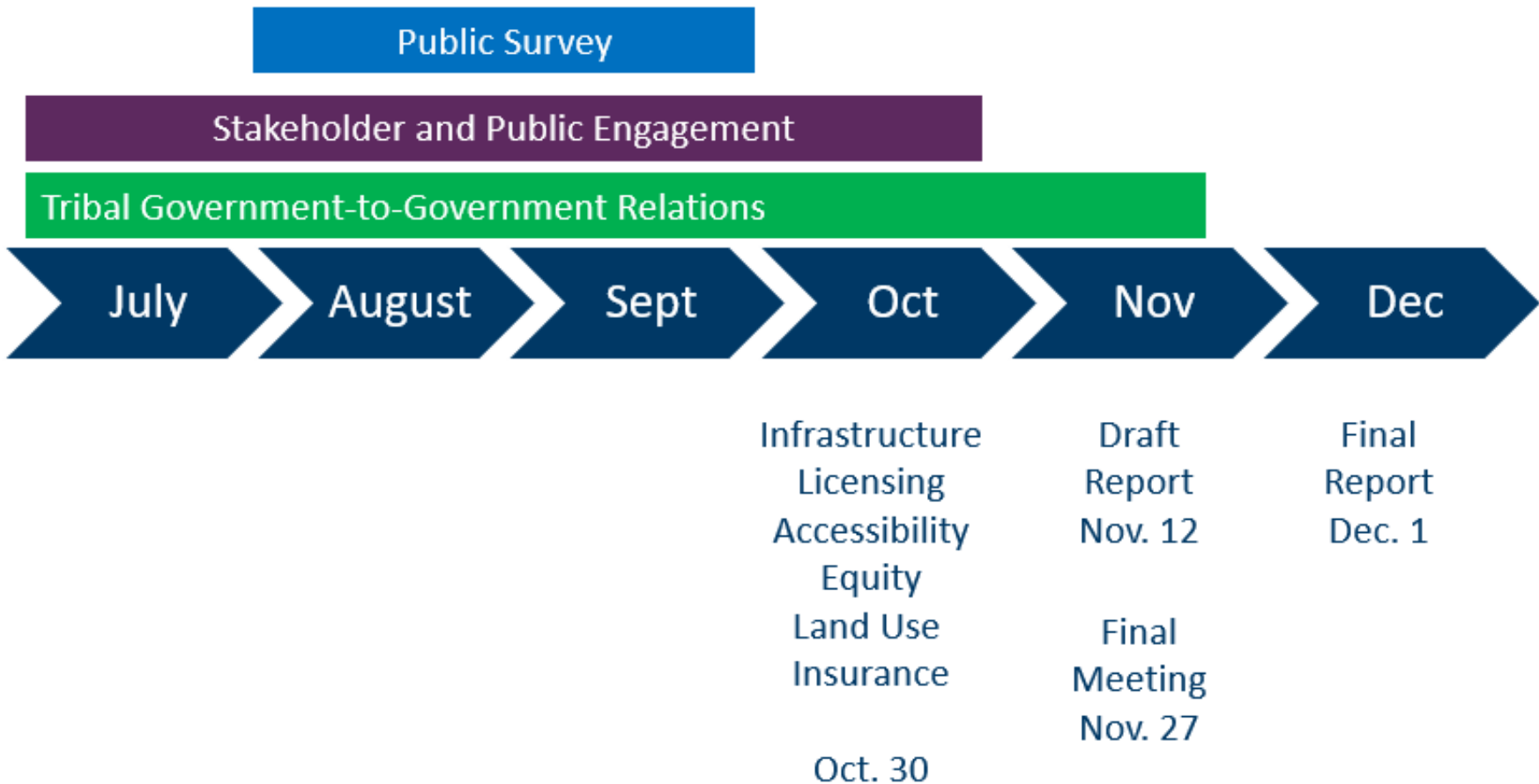
- Education and public engagement
- Connectivity
- Urban/rural divide
- Access to technology/shared mobility
- Accessibility by design and coordination with auto industry
- Continued conversations with older adults & caregivers



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Wrap - Up

# Timeline



# Thank you

**Christopher Clark**  
**Xcel Energy**

**Commissioner Charlie Zelle**  
**Minnesota DOT**