

MINNESOTA GOVERNOR'S COUNCIL ON CONNECTED & AUTOMATED VEHICLES



ANNUAL REPORT

February 2020



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This report was prepared by the Minnesota Department of Transportation Office of Connected and Automated Vehicles, known as CAV-X, with acknowledgment to the Advisory Council on Connected and Automated Vehicles, Interagency CAV Team members and special thanks to the CAV partners and stakeholders.

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A NOTE FROM OUR CHAIRS

The future of the transportation system is quickly evolving. With the emergence of connected and automated vehicles (CAV) and development of intelligent transportation systems (ITS), Minnesotans are experiencing a shift in the way we view transportation equity, safety, innovation and healthy, sustainable communities.

With rapid advancements in technology from the automotive sector and tech start-ups, now more than ever it is critical for government to collaborate with private industry, non-profits and researchers to share information and best practices to plan and prepare for an unknown future. Because we do not know when CAV will be widely available or deployed, statewide leadership is critical to ensure a shared vision and strategy to achieve our goals.

The Governor's Council on Connected and Automated Vehicles drives Minnesota towards one vision: to build a future transportation system that is safe, equitable, accessible, efficient, healthy and sustainable. Through policy recommendations and partnerships, the Council promotes community outreach, education, industry partnerships, research, and innovation to achieve this vision.

The Council is required to submit a written annual report to the Governor, highlighting the Council's activities and actions needed to ensure Minnesota is advancing CAV and emerging technologies. This 2020 report outlines our vision to achieve safety, equity, access, public health and sustainability in our transportation system and introduces the state to the new Governor's Advisory Council priorities.

There are many reasons we must research CAV. Driving is not as safe as it could be. Pedestrian fatalities are increasing across the country. In 2018, 381 Minnesota lives were lost in traffic deaths. Over 94% of these crashes involve human error. Families are impacted with injuries and financial losses. Many communities are left behind when faced with significant transportation barriers. Research shows that active, accessible transportation sustains healthy communities.

We have an opportunity to leverage the leadership of the Council and technological innovations to improve transportation safety, equity and mobility by giving people the freedom to move, get home safely, and save lives.

This report will outline the Council's vision, goals and priorities as of February 2020, noting that with evolving technology and policies these priorities may change. The report highlights CAV work occurring around the state. It is important we reach out to communities to hear from them to understand how to prepare for this evolution to advance a transportation system that brings us together as *One Minnesota*.

Sincerely,

Council Co-Chairs

Margaret Anderson Kelliher *Commissioner*
Minnesota Department of Transportation

Phil Magney, *Founder and President*
VSI Labs

Governor's Advisory Council on Connected and Automated Vehicles Members





1. BACKGROUND – WHAT IS CAV?

Automated vehicle technology is rapidly advancing around the world. These vehicles use software to take over some, or all, aspects of driving. There are varying levels of automation on the roadways today, ranging from adaptive cruise control to systems that allow drivers to remove their hands from the steering wheel. Currently, autonomous vehicles are not commercially available for personal use.

Connected vehicles can communicate with other vehicles, signals, bicycles, pedestrians, transit, rail and others. Connected vehicles use a combination of cameras, radar, and other sensors to avoid collisions and increase driving efficiency. Truck platooning is an example of available connected vehicle technology.

Intelligent transportation systems (ITS) are technologies that advance transportation safety and mobility by integrating advanced communications into our transportation infrastructure. ITS include a broad range of wireless and telecommunications information and electronic technologies. ITS is often known as the predecessor to CAV innovation. ITS allows our transportation to be ready when CAVs are more broadly deployed.

The auto industry has vastly overestimated the timelines when we will see CAVs on our public roads. In 2019 the industry walked back its predictions when these vehicles will be widely available. While the future is still unknown, some experts estimate it could be over 50 years before we see fully driverless vehicles. Now, over 80 pilots across the country are testing autonomous shuttles in limited, controlled environments to research these innovations and work with communities to understand their needs.

While it will be many years before we see autonomous vehicles on our roads without human drivers, the state believes it is important to prepare for the future of mobility. There are six key reasons the Council is planning for emerging transportation technologies.



Safety – Nearly 94% of traffic fatalities can be attributed to humans, such as distracted driving, speeding, and impairment. Automated vehicles could drastically reduce collisions if the private and public sectors can work together.



Mobility, Accessibility and Equity: CAVs may reduce transportation barriers for people with disabilities, aging communities, low income homes, and could provide better access to jobs and health care.



Economic and Workforce Development: Minnesota is competing in a global market. CAV provides Minnesota an opportunity to maintain a competitive business edge and develop talent.



Efficiency: Connected vehicles may reduce traffic congestion. CAVs may improve traffic flow in work zones, and predict adverse weather and emergencies.



Public Health and Sustainability: CAVs could help rethink the way we plan communities to maximize health and sustainable multimodal transportation. Since many CAVs are electric, they could reduce emissions to advance sustainability goals



State Fair Automated Vehicle Demonstration

2. COUNCIL'S VISION AND GOALS

VISION

Build a future transportation system that is safe, equitable, accessible, efficient, healthy, and sustainable.

Background

To understand how emerging technologies will impact our transportation system and how to use them to advance a safer, more equitable, accessible and sustainable transportation system, Governor Walz signed Executive Order 19-18 in April 2019 establishing the Governor's Advisory Council on Connected and Automated Vehicles (CAV).

The Governor appointed a 13-member council representing various sectors, including freight, transit, mobility, accessibility, research, business, industry, tech start-ups, labor, local government, data and cybersecurity, and insurance. State agencies, tribal governments, counties, and cities are also represented.

The executive order requires the council to:

- Explore partnerships
- Review developments in CAV and emerging technologies
- Develop policy
- Engage communities experiencing transportation barriers
- Advise the Departments of Transportation and Public Safety on the safe testing and deployment of CAV

Mission

Collaborate, partner and engage with government, industry, and communities to deploy CAV to promote a transportation system for all Minnesotans.

Goals



Safely test and deploy CAVs



Work with all levels of government



Engage with communities



Design a clear legal and regulatory environment



Promote access to transportation for all users



Equip Minnesota's workforce to adapt, transition and benefit from CAV



Promote healthy, sustainable communities



Invest in a system that inclusively meets the needs of all users



Minnesota's Shared Values

The Council also discussed creating a set of shared values for the state to achieve a healthier, sustainable transportation system. While not an exhaustive list, these values include:



Equity: Advance policies that promote transportation equity.



Mobility and accessibility: Promote inclusive policies that meet the needs of all users.



Trust: Uphold the public's interest with clarity and transparency. Understand community concerns about CAV technology and incorporate feedback into policy.



Public Health, Safety and Environment: Protect active transportation – like walking and biking – and healthy communities. Advance technology and policy that minimize environmental impacts.



Multi-Modal Efficiency: Support transit, air, freight, rail, ports and other modes. Guard against increased congestion.



Readiness: Prepare our workforce and businesses for the changes that technology will bring. Test and pilot technologies to ensure they meet the needs of all Minnesotans.

Underlying Principles

The Council noted over a dozen priorities that are critical to prepare the state for CAV. The Council recognizes that throughout its work, it must prioritize equity, mobility, accessibility, public health and environment in order to achieve its vision. This means:

- the Council's work will be viewed through an equity lens
- we must understand that multi-modal mobility is crucial to an integrated system
- all transportation options must be accessible and affordable
- active transportation, transit and healthy communities are vital to a thriving Minnesota
- we must together advance sustainability principles to remain resilient in an ever-changing climate.

Short-Term & Mid-Term Priorities

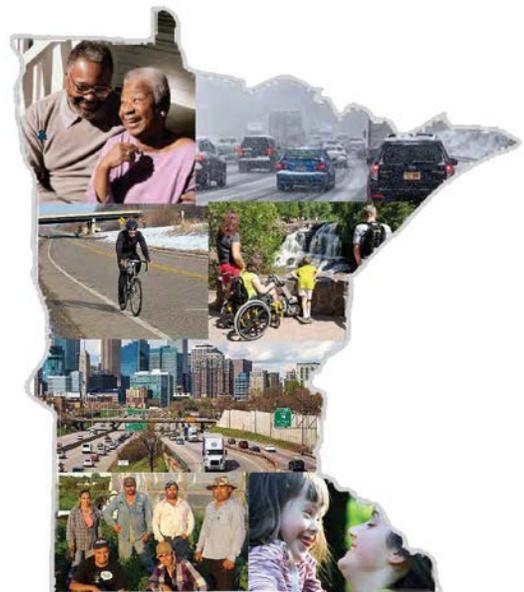
The Council divided its priorities into immediate 1-year priorities and longer-term actions over the course of its first term, which ends in 2023.

1-YEAR COUNCIL PRIORITIES

1. Equity, mobility, accessibility, public health and environment
2. Industry and research partnerships
3. Education, outreach, engagement, demonstrations, and pilots

3-YEAR COUNCIL PRIORITIES

1. Equity, mobility, accessibility, public health and environment
2. Develop industry and research partnerships
3. Invest in infrastructure
4. Law for safe testing and deployment
5. Education, outreach, engagement and demonstrations/pilots to educate communities and decision-makers
6. Economic and workforce development
7. Data privacy and cyber security
8. Insurance and liability
9. Align Minnesota with other states and federal government initiatives and share best practices
10. Human factors research on the impacts of CAV





FIBER OPTIC



TRAFFIC SIGNALS



SMART SIGNS



PAVEMENT MARKINGS

3. HOW DO WE PREPARE FOR CAV?

In 2018 the Governor’s Advisory Council prepared an executive report outlining over 100 recommended changes to state law, rule and policy to prepare for CAV. The report includes short- and long-term priorities. The recommendations focus on 10 different policy areas.



1. Transportation infrastructure
2. Equity
3. Accessibility
4. Data privacy and cyber security
5. Insurance and liability
6. Traffic regulations and safety
7. Land use and planning
8. Funding
9. Economic and workforce development
10. Driver’s licensing and vehicle registration

The Council and state agencies are starting to implement these recommendations, including several highlighted here.

Transportation Infrastructure

- Invest in fiber optic, upgrade traffic signals, improve pavement markings, and test smart signs
- Fund testing on public roads
- Develop platooning laws and plans to assess how CAVs will impact infrastructure

Data Privacy and Cyber Security

- Research how to collect, share and manage CAV data to protect privacy and prevent cyber attacks
- Update state law to address what government collects about humans who travel in CAVs

Equity and Accessibility

- Partner with industry and academia to conduct pilots throughout Minnesota with diverse communities to allow the public to learn about CAV and guide policy decisions

Traffic Regulations & Safety

- Determine what CAV data needs to be collected
- Enact policies that support vulnerable road users such as cyclists, pedestrians, aging populations and transit users



Iowa

Iowa and Minnesota have similar programs in that Iowa’s goal is to support drivers *today* while advancing the automated driving systems of *tomorrow*. Last year the Iowa legislature authorized AVs on public roads, requiring the DOT to develop rules. The University of Iowa has one of the leading CAV simulators in the country, which won a federal grant last year to test CAV applications in rural America.

Iowa has a similar statewide leadership body, the *Advisory Council on Automated Transportation*. The Council’s subcommittees focus on infrastructure, policy, economic development, and public safety and law enforcement. Similarly, Iowa DOT focuses its readiness in four key areas: infrastructure, organizational, statewide and nationally. This allows the DOT to focus on pavement marking upgrades, data governance, supporting the statewide council and being involved in national CAV strategy. Minnesota and Iowa have conducted peer exchanges and host regular meetings to share information and coordinate programs.

Michigan

Michigan leads the nation in many ways due to the local presence of the auto industry in Detroit. Michigan law allows platoons and CAVs on all public roads. Due to strong industry partnerships, there are over 50 CAV pilots throughout the state. All of the state’s CAV activities are coordinated under its *Planet M* economic development organization, similar to the *DestinationCAV* brand the Minnesota DOT created for its state efforts.

Michigan has a similar statewide council, the *Michigan Council on Future Mobility*. Its mission is to partner with industry to deploy CAV. It focuses on 10 goals, including national leadership, educating policymakers, and branding the state as the epicenter of mobility policy. Michigan also has a *CAV Working Group*, which includes researchers, the state, auto industry, consultants.

Recent CAV planning efforts include upgrading digital infrastructure with digital maps, upgraded CV traffic signals, and testing smart work zones.



Michigan is investing in physical infrastructure like pavement markings and smart signs. They’re working towards a Strategic Plan, funding a *Michigan Mobility Challenge* (similar to Minnesota’s *CAV Challenge*) to foster innovative ideas, continuing MCity research and established the *American Center for Mobility*, a partnership between universities and industry to advance CAV. Wayne State created one of the first U.S. mobility programs to train students on CAV.

Texas

With the largest highway system in the country, Texas has several leadership bodies overseeing innovation and future transportation. The Texas Technology Task Force, led by the University of Texas, develops research with industry on emerging transportation technologies. The State Transportation Innovation Council aligns national research with local programs. The Texas CAV Task Force coordinates CAV testing, which is legal on highways without human drivers. They meet monthly to learn about CAV data, education, workforce, and liability issues.



The Texas Innovation Alliance gathers all statewide stakeholders to align efforts on equity, mobility, sustainability, data, and freight to ensure innovation reaches all parts of the state. Over 30 organizations are represented and partner with private industry to test CAV and emerging technologies. The Alliance convenes an annual summit to share findings and convenes bi-weekly teleconferences to focus their priorities. Minnesota is looking at bringing this model to the Bold North to align the state’s efforts to understand how CAV innovations can improve quality of life in our state.

Texas has over 21 active CAV pilots, demos and deployments focusing on connected vehicle applications, autonomous shuttle pilots, platooning, automated freight, ridesharing, and shared mobility. With more tech companies moving to Austin, the greater region is quickly becoming one of the nation’s leaders in CAV.



Truck Platoon Demonstration in Europe

5. STATE, REGIONAL AND FEDERAL POLICY

Minnesota Legislature Passed Platooning Law

Recognizing how other states are preparing for CAV, the 2018 Advisory Council developed two bills to authorize automated vehicle testing and to authorize truck platooning. Platooning is a connected vehicle technology that allows vehicles to convoy closely together.

The trucking and freight industry testified at the legislature to discuss the safety, fuel efficiency, and driver health benefits of platooning. With strong bipartisan support, the 2019 legislature passed a platooning law, requiring commercial vehicles to submit a plan to the Departments of Public Safety and Transportation. Platooning is only allowed on specific state highways.

The state and industry are coordinating to ensure platoons do not impact the safety of the traveling public. The law requires a human operator in each vehicle. Platooning plans are reviewed by law enforcement and engineers to ensure safety risks are mitigated and that platooning does not negatively impact the road system.

Automated Vehicle Testing Outreach

The legislature expressed concern about authorizing automated vehicle testing, noting that the state needs to do more education, engagement and outreach to work with stakeholders and

communities before it passes a law to authorize testing on public roads.

Federal Policy

Congress is debating the AV START Act - a law which would ensure CAV safety and allow testing on public roads.

The U.S. Federal Communications Commission proposed a rule to re-allocate part of the “safety spectrum” currently used for connected vehicles to cellular communications. This significantly impacts highway safety because cell signal can face delays or dropped service. Minnesota is coordinating with other states, researchers and safety advocates, including the Intelligent Transportation Society of America to proactively coordinate on the propose policy.

Regional and National Strategies

Minnesota is working with other states to develop a Midwest CAV strategy and a *National Strategy on Automation Mobility* to promote uniform policies, research and partnerships. Minnesota leads national committees on CAV to establish best practices and share lessons learned with other states, regions and countries. Minnesota is hosting its first *CAV Summit* with 10 other states in 2020 to develop these policies and to coordinate on filling research gaps.

6. HOW MINNESOTA IS PREPARING FOR CAV

Minnesota Department of Transportation

The MnDOT Connected and Automated Vehicles Office (CAV-X) had dedicated staff working on leadership, policy, planning and programming to help the state understand how to prepare for CAV. Activities include:

- Crafting one of the country's first CAV Strategic Plans to help DOTs more strategically and innovatively plan for the changes CAVs will bring. Other states like Michigan and Texas are modeling their efforts after Minnesota
- Inventing *The Minnesota CAV Challenge*, an award-winning innovative procurement where industry can propose unique ideas to solve Minnesota's transportation challenges with CAV. Over 53 unique ideas have been proposed with 12 active projects being planned
- Piloting a highly automated shuttle in Rochester, Minnesota near Mayo Clinic
- Testing smartphone applications that warn drivers of nearby pedestrians and cyclists to help avoid collisions
- Assessing the feasibility of installing broadband using publicly-owned rights-of-way to advance connectivity for rural communities and CAVs
- Holding demonstrations to educate communities on the risks and benefits of CAV to seek feedback on how we should prepare

- Joining the [Automated Bus Consortium](#) to deploy automated transit across the U.S.
- Researching autonomous trucking in winter weather at MnDOT's private test track
- Testing autonomous maintenance vehicles to eliminate risks for drivers in hazardous sites
- Representing Minnesota on regional and national committees to advance CAV research and policy
- Attending conferences, workshops and events to discuss CAV, share lessons learned, and foster discussion
- Launching the nation's first cyber-secured Connected Corridor, which uses connected technologies to send basic safety messages between CAVs and traffic signals
- Attending peer exchanges across the country – including Iowa, Texas, and Wisconsin - to improve Minnesota research and testing
- Developing testing corridors and partnerships to advance CAV research

Counties

The Minnesota County Engineers Association created a CAV committee, which meets regularly to coordinate on CAV topics. They also helped to develop [Preparing Local Agencies for the Future of CAV](#), a report on how local agencies can leverage current activities and resources to prepare for CAVs.

Autonomous Shuttle Winter Weather Testing at MnDOT MnROAD Facility





Autonomous Shuttle Demonstration at November 2019 Advisory Council Meeting

Interagency CAV Team (I-CAV)

I-CAV represents all state agencies, the University of Minnesota, Met Council, the U.S. DOT's Federal Highway Administration and others. Its mission is to collaborate and develop cross-agency policies and programs to strategically prepare Minnesota for CAV, and support the Advisory Council. I-CAV is developing a new mission to focus on outreach, partnerships, education, and technical research on data and insurance.

Cities

The City of Minneapolis's draft [Transportation Action Plan](#) will guide future multi-modal planning and design to address CAV and other technologies. The plan will be available for public comment. Minneapolis also coordinates with the National Association of City Transportation Officials (NACTO) which published the [Blueprint for Autonomous Urbanism](#).

The [Twin Cities Shared Mobility Collaborative](#) is a group of transportation leaders, public agencies, private companies, city officials and nonprofits formed to implement the [Twin Cities Shared Mobility Action Plan](#), which strives to increase transportation options for the Minneapolis-St. Paul metropolitan area.

The League of Minnesota Cities is seeking opportunities for city officials to learn more about CAV and what it will take to prepare for more widespread use of CAV technologies.

Universities and Colleges

University of Minnesota faculty and staff are actively researching policy, planning, engineering, and other solutions to fill in research gaps in CAV. One interdisciplinary research team and the [Center for Transportation Studies](#) is advancing research on shared, automated vehicles through a National Science Foundation grant.

The [Minnesota State Transportation Center of Excellence](#) includes 33 campuses across the state to develop a high-tech CAV workforce.

Private industry

Many Minnesota companies are advancing CAV innovation. Local tech start-up VSI Labs, founded by Council co-chair Phil Magney, completed its first automated cross-country road trip to both coasts to learn about how the technology adapts.

Council members Polaris Industries and 3M Corporation are working on connected vehicle innovations, with 3M promoting advanced transportation infrastructure, including markings and signs to help human operators and CAVs safely operate in all conditions.

The *Guidestar Board of Directors* and *ITS Minnesota* are groups that include public and private sector engineers, academics and practitioners that work on CAV and ITS programs. These groups hold regular meetings to discuss technological developments and share best information.

7. BUILDING AN ALLIANCE

Building a Statewide Coalition

The 2018 Executive Report recommends developing building a statewide coalition, or an alliance, to coordinate activities throughout the state. An alliance could serve as a forum for regular updates on trends in CAV, education, and develop best practices. The goal is to create a network of local, regional, and state organizations who share a commitment to leveraging CAV and emerging technologies to advance a safe, equitable, accessible, efficient, healthy, and sustainable transportation system for all.



A statewide alliance is intended to be a broad partnership that includes representatives from universities and technical colleges, private industry, nonprofits, and government. The alliance can coordinate CAV activities throughout the state. The Council is committed to building an alliance and will work in the coming years to invite partner organizations, including, but not limited to:

- Associated General Contractors
- Governor’s Advisory Council on CAV
- Greater MSP
- Guidestar Board of Directors
- Institute of Traffic Engineers (ITE) Minnesota
- Intelligent Transportation Society (ITS) Minnesota
- Interagency CAV Team
- League of Minnesota Cities
- Medical industry
- Met Council/Metropolitan Planning Organizations
- Chamber of Commerce
- County Engineers Association
- Freight Advisory Council
- High Tech Association
- State Colleges and Universities
- Transportation Alliance
- Private industry (automotive, technology, medical, insurance, etc.)
- Twin Cities Shared Mobility Collaborative
- University of Minnesota

Committees

The previous Advisory Council had 10 committees focusing on many different priorities. This Council recognizes the need to focus Minnesota’s efforts, and will be discussing whether new committees need to be formed or whether there are alternative ways to share information and prioritize work. The Council noted opportunities for smaller working groups to collaborate on initiatives potentially including the below topics.

Safety & Law Enforcement	Connectivity & Data	Infrastructure Investment	Labor & Workforce Development	Outreach and Education
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8. 2020 SNEAK PREVIEW

IN 2020 THE COUNCIL AND ITS PARTNERS WILL BE WORKING ON KEY PRIORITIES.



Public engagement, outreach and demonstrations: CAV Demonstrations will occur in St. Cloud, the Capitol and Rochester beginning in April. CAV workshops will occur at the *Transportation Conference* in March, *Safety Conference* in May, State Fair in August, and the *Toward Zero Death Conference* in October. Demonstrations will occur throughout the state for the public to see the technology and provide feedback. A summer CAV conference and fall technology showcase are also being planned.



Industry partnerships: Minnesota will continue collaborative public-private partnerships to understand how the state should prepare for CAV. This winter autonomous trucking company Plus.Ai is testing at the state's MnROAD facility. MnDOT is pursuing opportunities to research at its testing corridors, winter-weather research, and learning how technology must be more accessible and safe for all communities.



Collaboration: The Council is discussing the creation of an innovation alliance to ensure collaboration across the state. Subcommittees are also being created to prioritize immediate needs of the Council and its partners.



Data privacy and cybersecurity: With each CAV transmitting 1,000 gigabytes of data each day, agencies need to prepare for how to collect data, store it, share it, and protect it. Even more important is working with industry to ensure vehicles are secure from cyber-attacks. Minnesota is coordinating with technical experts to advance this research to develop state policies.



Insurance and liability: Laws do not currently address who is responsible when a CAV is involved in a collision. Minnesota plans to coordinate with the insurance industry and others to understand how to apportion liability appropriately and equitably. Additionally, insurance companies need data from these vehicles to understand how to create insurance products that protect consumers.



Mobility, access and equity: Many CAVs are not accessible to people with disabilities. Current CAV pilots across the country are only located in urban areas. Minnesota demos require equal access and shared mobility to ensure Minnesotans across the state – regardless of their rural location, socio-economic status and physical ability - can live, work, and play where they choose.



APPENDIX

CAV ADVISORY COUNCIL MEMBERSHIP AND LEADERSHIP

ADVISORY COUNCIL MEMBERS	ORGANIZATION
COMMISSIONER MARGARET ANDERSON KELLIHER, CO-CHAIR	Minnesota Department of Transportation
AMBER BACKHAUS	Automobile Dealers Association
DAN CHEN	3M
RYAN DANIEL	St. Cloud Metropolitan Transit
JACOB FREY (REPRESENTED BY ROBIN HUTCHINSON)	City of Minneapolis
MICHAEL GORMAN	Split Rock Partners
JOHN HAUSLAUDEN	Minnesota Trucking Association
PHIL MAGNEY, CO-CHAIR	VSI Labs
LAURIE MCGINNIS	University of Minnesota Center for Transportation Studies
MYRNA PETERSON	Mobility Mania
EDWARD REYNOSO	Teamsters Joint Council
DAMIEN RIEHL	Fastcase Legal Research Platform
VICKY RIZZOLO	American Family Insurance
PATRICK WELDON	Polaris

EX-OFFICIO MEMBERS	ORGANIZATION
MAYOR JASON GADD	League of Minnesota Cities
MAYOR TINA FOLCH	Mayor of Hasting, League of Minnesota Cities Representative
COMMISSIONER ALICE ROBERTS-DAVIS	Department of Administration
COMMISSIONER THOM PETERSON	Department of Agriculture
COMMISSIONER STEVE KELLEY (REPRESENTED BY ANNE O'CONNOR)	Department of Commerce
COMMISSIONER STEVE GROVE	Department of Employment and Economic Development
COMMISSIONER JAN MALCOLM (REPRESENTED BY EMILY SMOAK)	Department of Health
COMMISSIONER ANTHONY LOUREY	Department of Human Services
COMMISSIONER MARK PHILLIPS	Iron Range Resources and Rehabilitation Department
COMMISSIONER JOHN HARRINGTON	Department of Public Safety
COMMISSIONER CYNTHIA BAUERLY	Department of Revenue
COMMISSIONER TAREK TOMES	Minnesota IT Services
COMMISSIONER LAURA BISHOP (REPRESENTED BY TODD BIEWEN)	Minnesota Pollution Control Agency
WAYNE SANDBERG	County Representative, Association of Minnesota Counties
LAURIE BEYER-KROPUENSKA	Interim Executive Director, Minnesota Council on Disability
REP. CONNIE BERNARDY	Majority Party Representative, Minnesota House of Representatives
SEN. SCOTT NEWMAN	Majority Party Representative, Minnesota Senate
SEN. SCOTT DIBBLE	Minority Party Representative for Minnesota Senate
CHAIRWOMAN CATHY CHAVERS	Boise Fort Tribe, Minnesota Indian Affairs Council
CHARLIE ZELLE	Chair, Met Council



/Communication
/Battery
/Navigation
/Mirrorless
/Ecology

Self-Driving