Alaska Department of Transportation & Public Facilities

Research & Technology Transfer

Connected & Automated Vehicle Working Group Strategic Plan

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Rapidly evolving technology is changing the how and why of travel. The Alaska Department of Transportation and Public Facilities (DOT&PF) is preparing for these changes by developing a Connected and Automated Vehicle (CAV) Strategic Plan for the established Working Group, made up of stakeholders across Alaska.

The CAV Strategic Plan centers on the administration of Alaskan roads and highways and associated infrastructure that will support the deployment of emerging technologies. To comprehensively strategize for CAVs, two technical memorandums were prepared that provide an overview of CAV planning best practices (Technical Memorandum #1 – Appendix A) and summarize current Alaska CAV readiness and needs (Technical Memorandum #2 – Appendix B). Through stakeholder engagement, the Strategic Plan builds upon these technical memorandums to address needs and challenges through a comprehensive strategic framework. As CAVs evolve and market penetration increases, agencies will need to modify planning, policymaking, and programming processes.

It is recommended that the CAV Working Group form six subcommittees, each championing a different focus area, as listed below. Appendix C contains detailed short- and long-term recommended actions for each subcommittee.

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METRIC (SI*) CONVERSION FACTORS

APPROXIMATE CONVERSIONS TO SI UNITS

Symbol	When You Know	Multiply By	To Find	Symbol
		LENGTH		
in	inches	25.4		mm
ft	feet	0.3048		m
yd	yards	0.914		m
mi	Miles (statute)	1.61		km
		AREA		
in^2	square inches	645.2	millimeters squared	cm^2
ft^2	square feet	0.0929	meters squared	m^2
yd^2	square yards	0.836	meters squared	m^2
mi^2	square miles	2.59	kilometers squared	km^2
ac	acres	0.4046	hectares	ha
		MASS (weight)		
oz	Ounces (avdp)	28.35	grams	g
lb	Pounds (avdp)	0.454	kilograms	kg
T	Short tons (2000 lb)	0.907	megagrams	mg
		VOLUME		
fl oz	fluid ounces (US)	29.57	milliliters	mL
gal	Gallons (liq)	3.785	liters	liters
ft^3	cubic feet	0.0283	meters cubed	m^3
yd^3	cubic yards	0.765	meters cubed	m^3

Note: Volumes greater than 1000 L shall be shown in m^3

		TEMPERATURE (exact)		
ºF	Fahrenheit temperature	5/9 (ºF-32)	Celsius temperature	ºC
		ILLUMINATION		
fc	Foot-candles	10.76	lux	lx
fl	foot-lamberts	3.426	candela/m^2	cd/cm^2
		FORCE and PRESSURE or STRESS		
lbf	pound-force	4.45	newtons	N
psi	pound-force per square inch	6.89	kilopascals	kPa

These factors conform to the requirement of FHWA Order 5190.1A *SI is the symbol for the International System of Measurements

APPROXIMATE CONVERSIONS FROM SI UNITS

Symbol	When You Know	Multiply By	To Find	Symbol
		LENGTH		
mm	millimeters	0.039	inches	in
m	meters	3.28	feet	ft
m	meters	1.09	yards	yd
km	kilometers	0.621	Miles (statute)	mi
		AREA		
mm^2	millimeters squared	0.0016	square inches	in^2
m^2	meters squared	10.764	square feet	ft^2
km^2	kilometers squared	0.39	square miles	mi^2
ha	hectares (10,000 m^2)	2.471	acres	ac
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g	grams	0.0353	Ounces (avdp)	oz
kg	kilograms	2.205	Pounds (avdp)	lb
mg	megagrams (1000 kg)	1.103	short tons	T
		VOLUME		
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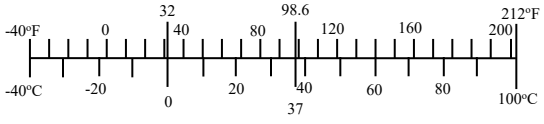
liters	liters	0.264	Gallons (liq)	gal
m^3	meters cubed	35.315	cubic feet	ft^3
m^3	meters cubed	1.308	cubic yards	yd^3

		TEMPERATURE (exact)		
ºC	Celsius temperature	9/5 ºC+32	Fahrenheit temperature	ºF
		ILLUMINATION		
lx	lux	0.0929	foot-candles	fc
cd/cm^2	candela/m^2	0.2919	foot-lamberts	fl
		FORCE and PRESSURE or STRESS		
N	newtons	0.225	pound-force	lbf
kPa	kilopascals	0.145	pound-force per square inch	psi



Connected & Automated Vehicle Working Group Strategic Plan

Alaska DOT&PF | November 2021

ALASKA DEPARTMENT
OF TRANSPORTATION
& PUBLIC FACILITIES

KITTELSON & ASSOCIATES

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November 2021

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EXECUTIVE SUMMARY

Rapidly evolving technology is changing the *how* and *why* of travel. The Alaska Department of Transportation and Public Facilities (DOT&PF) is preparing for these changes by developing a Connected and Automated Vehicle (CAV) Strategic Plan for the established Working Group.

The CAV Strategic Plan centers on the administration of Alaskan roads and highways and associated infrastructure that will support the deployment of emerging technologies. To comprehensively strategize for CAVs, two technical memorandums were prepared that provide an overview of CAV planning best practices (Technical Memorandum #1 – **Appendix A**) and summarize current Alaska CAV readiness and needs (Technical Memorandum #2 – **Appendix B**). Through stakeholder engagement, the Strategic Plan builds upon these technical memorandums to address identified needs and challenges through a comprehensive strategic framework.

As CAVs evolve and market penetration increases, agencies will need to modify planning, policymaking, and programming processes. Key findings include:

- A previous research report was prepared to assess DOT&PF's readiness for CAVs in 2020, concluding that "**Alaska is at an early stage of CAV readiness.**"
- Alaska's stance toward connected and automated transportation is to **monitor its progress** and **apply best practices** from leading states for implementation steps.
- To stay current on latest industry trends and their impact to Alaska, the CAV Working Group should **update this Strategic Framework every 3–5 years.**
- Potential applications of CAVs and related technologies that would advance transportation operations in Alaska include:
    - **Near-Term:** 'Smart' snowplows, enhancement of the 511 system, and addition of sensors to DOT fleet vehicles to collect roadway surface condition data.
    - **Mid-Term:** Automated fleets of freight vehicles platooning on major highways and automated detection of fleet vehicle crashes.
    - **Long-Term:** Automated fleets of shared passenger vehicles on urban systems, transit integration for longer, inter-community automated routes.
- As CAV readiness is still at an early stage, collaboration with peer states and prioritizing education with partnering agencies and communities will be crucial to the successful implementation of CAVs and other emerging technologies.
- In order to hire supporting positions for championing these efforts, agencies may need to rethink organizational structure and typical hiring advertisements to attract data scientists and data/ technology management-oriented staff.
- Challenges related to DOT&PF's preparation include funding constraints and the **need for statewide CAV legislative direction**, a CAV cybersecurity plan, and cutting-edge industry partners.
- Due to funding constraints, CAV-implementation efforts will likely include private industry partners and/or federal funding.
- It is recommended that the CAV Working Group form six subcommittees, each championing a different focus area, as listed below. **Appendix C** contains detailed short- and long-term recommended actions for each subcommittee.

Policy & Legislation	**Infrastructure Readiness**	**Industry Partnerships**
Outreach & Education	**Public Safety & Enforcement**	**Freight Coordination**

Acronym List

AAMVA	American Association of Motor Vehicles Administration
AAC	Alaska Administrative Code
ADAS	Advanced Driver Assistance Systems
ADS	Automated Driving System
AEVWG	Alaska Electric Vehicle Working Group
ATSPM	Automated Traffic Signal Performance Measures
AV	Automated Vehicle
CAV	Connected and Automated Vehicle
CV	Connected Vehicle
DOT	Department of Transportation
DOT&PF	Alaska Department of Transportation & Public Facilities
EV	Electric Vehicle
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
ITS	Intelligent Transportation Systems
LRTP	Long-Range Transportation Plan
MPO	Metropolitan Planning Organization
NCHRP	National Cooperative Highway Research Program
NHTSA	National Highway Traffic Safety Administration
PMBs	Portable Message Boards
PPP	Public-Private Partnerships
RWIS	Road Weather Information System
SPaT	Signal Phasing and Timing (data)
SWOT	Strengths, Weakness, Opportunities, and Threats
TIP	Transportation Improvement Program
TMC	Traffic Management Center
TSMO	Transportation Systems Management and Operations
V2I	Vehicle-to-Infrastructure (Communications)
V2V	Vehicle-to-Vehicle (Communications)
VMT	Vehicle Miles Traveled

INTRODUCTION

Rapidly evolving technology is changing the nature of travel as well as the trips made. The Alaska Department of Transportation and Public Facilities (DOT&PF) is preparing for these changes by developing a Connected and Automated Vehicle (CAV) Working Group Strategic Plan.

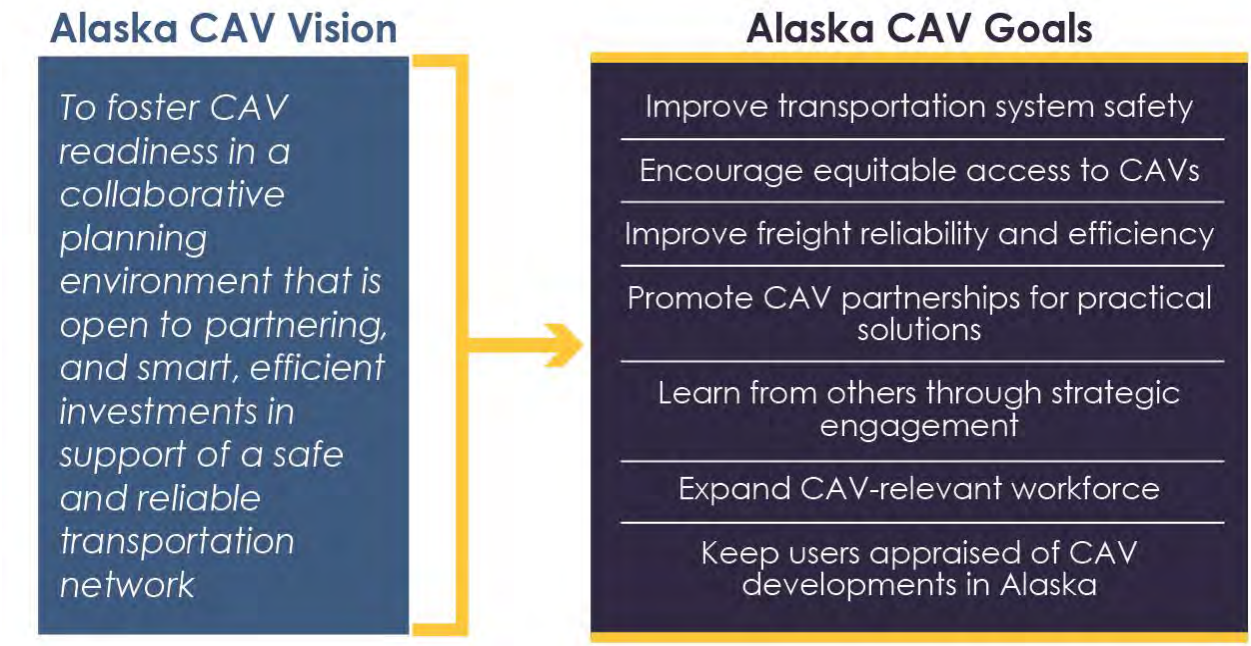
The state of Alaska is a unique and complex place—geographically, economically, politically, and socially. With mountain ranges, glaciers, water, and vast wilderness creating natural barriers to transportation, interconnectivity cannot be achieved by cars and roads alone. Even so, emerging vehicular technologies are making their way to Alaska. As stewards of the transportation system, DOT&PF and its planning and operations partners must prepare for the future that is being tested on roads today. Although Alaska will not likely be a leader in testing or deploying cutting-edge CAV technologies, DOT&PF and the CAV Working Group are ready to apply the best practices gleaned elsewhere to maximize the potential benefits of CAVs for every Alaskan. This CAV Working Group Strategic Plan will serve as a guiding document, outlining the vision, goals, and guiding principles that will inform how emerging technologies are adopted by key stakeholders. This Plan will be used to guide policy and programming decisions in the future; to educate the public, elected officials, and agency staff; and as a starting point for future research, training, and investments.

This CAV Working Group Strategic Plan centers around roads, highways, and associated infrastructure that will support the deployment of emerging technologies. This Strategic Plan comprehensively strategizes a CAV readiness approach, building upon two memorandums (**Appendices A and B**). The first memorandum provides an overview of best practices in planning for CAVs. The second summarizes Alaska's current CAV readiness. Developed through working group engagement, this Strategic Plan expands upon these technical memorandums to address identified needs and challenges by outlining a strategic framework. This framework is built upon the guiding principles identified by NACTO through the best practices review[1]:

- **Design for Safety** – Safety must remain at the forefront of both public- and private-sector decision-making.
- **Move People Not Cars** – Agencies and technology producers must prioritize modes that move people efficiently.
- **Distribute the Benefits Equitably** – Land use and policy decisions made today will be essential to ensure the benefits of AV technologies are equitably shared.
- **Data-Driven Decision-Making** – Agencies must maintain access to existing transportation data and find ways to utilize the data generated by new technologies.
- **Technology is a Tool** – AV technologies are tools to achieve better transportation outcomes.
- **Act Now!** – To ensure that AV technologies advance agency goals.

[1] National Association of City Transportation Officials (NACTO). (2017). *Blueprint for Autonomous Urbanism: Second Edition*. https://nacto.org/publication/bau2/

Building upon the CAV Working Group charter, this strategic planning effort included refinement of the Alaska CAV vision and support goals, as follows:



CAV Working Group Membership

Established by the DOT&PF Commissioner in cooperation with the Municipality of Anchorage, metropolitan planning organizations (MPOs), and other state agencies, the Alaska CAV Working Group meets quarterly and is comprised of representatives from numerous state and partner agencies and industry, including:

- Department of Commerce, Community and Economic Development
- Department of Natural Resources
- Department of Motor Vehicles
- Alaska Trucking Association
- Federal Highway Administration (FHWA)
- Anchorage Metropolitan Area Transportation Solutions (AMATS)
- Fairbanks Area Surface Transportation (FAST) Planning
- Municipality of Anchorage (MOA)
- DOT&PF representation from:
  - Statewide and regional planning and engineering, and ITS Coordinators
  - Statewide research, development and technology transfer
  - Statewide electrical engineer
  - Statewide ROW

Current State of CAVs & Related Technologies

What are CAVs?

The umbrella term 'connected and automated vehicles' (CAVs) refers to vehicles that can communicate with other vehicles or transportation infrastructure or that can perform some or all driving tasks.

A connected vehicle (CV) is a vehicle that can communicate with other vehicles, infrastructure, or other wireless technologies. CVs use a variety of equipment to sense, collect, and transmit real-time data, such as road or traffic conditions, weather conditions, and vehicle speeds. An example of a connected vehicle is a transit bus that communicates its location to signals along its route.

There are three key types of connected vehicle communications:

- **V2V:** Vehicle-to-vehicle communication
- **V2I:** Vehicle-to-infrastructure communication
- **V2X:** Vehicle-to-everything communication

Also known as driverless or self-driving vehicles, automated vehicles (AVs) are equipped with sensors (e.g., cameras, radar, lidar, or GPS) that allow onboard computers to perform some or all of the driving tasks. Currently, most AVs can perform driving tasks under certain conditions only, which means they are not yet fully automated. An example of a currently available automated vehicle is a shuttle bus operating on a fixed route.

While there is general agreement that future vehicles will be both connected and automated, these types of technologies rely on different systems, processes, and infrastructure, and therefore must be considered separately in planning. The US Department of Transportation (USDOT) produced the graphic in **Figure 1** to highlight how these technologies interact. DOT&PF and the Working Group members are focused on strategically planning for connected and automated vehicles.

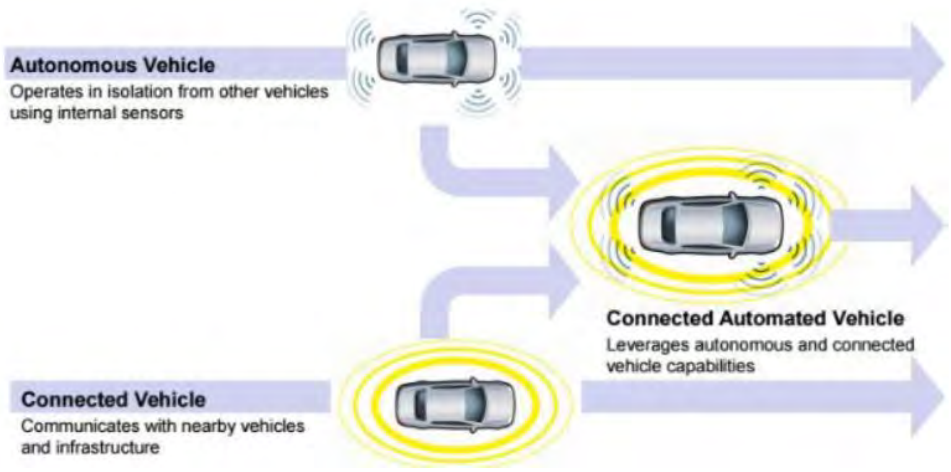


Figure 1. Automated Vehicles, Connected Vehicles, and Connected Automated Vehicles

Source: USDOT

Why are CAVs important?

CAVs have the potential to impact travel and land use by reducing the monetary cost of travel, reducing the time cost of travel, and making travel more accessible to more people. The potential impacts of CAVs are varied and subject to technology development, market direction, infrastructure, and policy guidance. As CAVs develop, further refinement to planning strategies will be necessary to amplify or mitigate these impacts. In 2019, the National Cooperative Highway Research Program (NCHRP) published *Report 924*, which provides a comprehensive assessment of transformational CAV technologies and their potential impacts.[2] The impacts discussed in this section are broad and will likely evolve as technology continues to advance. Anticipated impacts of CAVs include:

- Freight
- Roadway System Capacity
- Safety
- Liability

FREIGHT

Adoption of automation technologies can increase economic activity and job creation in multiple sectors, specifically freight and logistics. According to the FHWA report *Driving Automation Systems in Long-Haul Trucking and Bus Transit*, although the introduction of automation technologies is often historically associated with job loss, there are several factors that are expected to mitigate these impacts.[3] First, the timeline and widespread adoption of automation technologies is not expected to be immediate, but instead a gradual process that allows for natural attrition and training of staff. Second, automation technologies are expected to improve freight movement processes by increasing road capacity, reducing fuel consumption through platooning, and reducing labor costs. Additionally, in their 2021 report *Macroeconomic Impacts of Automated Driving Systems in Long-Haul Trucking* the FHWA modeled economic impacts of automation on fast, medium, and slow adoption timelines and reported increases in annual earnings for US workers, national gross domestic product, and overall employment across these scenarios.[4]

ROADWAY SYSTEM CAPACITY

Capacity may increase due to shorter headways with high adoption rates of both connected and automated vehicles. Agencies can follow guidance for planning for capacity impacts by using the capacity adjustment factors for CAVs provided in an upcoming update to the *Highway Capacity Manual, Sixth Edition: A Guide for Multimodal Mobility Analysis (HCM)*.[5]

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[2] National Cooperative Highway Research Program. (2018). *Report 924: Foreseeing the Impacts of Transformational Technologies on Land Use & Transportation*. Transportation Research Board.

[3] Shankwitz, C. (2017). *Long-haul Truck Freight Transport and the Role of Automation: Collaborative Human–Automated Platooned Trucks Alliance (CHAPTA)*. Western Transport Institute, Bozeman. https://westerntransportationinstitute.org/wp-content/uploads/2017/06/CHAPTA_WhitePaper_13JN2017.pdf

[4] Waschik, Robert, et al.(2021). *Macroeconomic Impacts of Automated Driving Systems in Long-Haul Trucking*. No. DOT-VNTSC-FHWA-20-16. United States. Department of Transportation. Intelligent Transportation Systems Joint Program Office. https://rosap.ntl.bts.gov/view/dot/54596

[5] Though not yet formally published, the TRB Highway Capacity and Quality of Service committee is in the process of reviewing and approving updates to the *HCM 6th Edition*, including the addition of CAV capacity adjustment factors

For freight and longer passenger trips, platooning (the movement of a fleet of vehicles controlled as one unit by CAV technology) is expected to reduce travel time by optimizing the distance between trucks in a platoon, reducing air drag and allowing more vehicles on the roadway.

SAFETY & LIABILITY

Transportation system safety will likely improve with the widespread adoption of CAVs, as CAVs are expected to **improve transportation system safety by reducing crash frequency and/or severity**—the amount of times crashes occur and the seriousness of injuries or damages incurred—through a reduction in human errors, increased compliance with traffic controls, and improved communication between vehicles. Reducing the number of crash-related injuries or fatalities could save lives and reduce the expense of insurance claims. As CAV adoption increases, state legislatures will need to revise existing laws regarding crash liability to determine who or what is at fault in a crash.

Law Enforcement
Enforcement of traffic laws will likely change as CAVs penetrate the market. Equipping traffic sensors with automated enforcement capabilities could be a solution for mixed conventional and CAV traffic. Additionally, keeping Signal Phasing and Timing (SPaT) and MAP (geographic intersection coordinates) data up to date will be crucial for CAVs to obey speed limits and local traffic regulations.

What are CAV possibilities for Alaska?

Many of the technologies that support CAV applications are already in use, such as the crowdsourcing of roadway conditions for the Alaska 511 Traveler Information System and private vehicles equipped with advanced driver assistance systems like lane-keep, adaptive cruise control, and parallel parking assistance. Due to the unique and varied transportation conditions in Alaska, some CAV applications are possible over the next 20 years. For example:

- **Near-Term:** 'Smart' snowplows, enhancement of the 511 system to potentially include real-time snowplow tracking data and roadway condition forecasting, and addition of sensors to DOT fleet vehicles to collect roadway surface condition data.
- **Mid-Term:** Automated fleets of freight vehicles platooning on major highways and automated detection of fleet vehicle crashes.
- **Long-Term:** Automated fleets of shared passenger vehicles on urban systems and transit integration for longer, inter-community automated routes.

These possibilities will be influenced by the market development of technologies and the actions of the CAV Working Group. This Plan presents the Strategic Framework, which contains many recommendations for working toward the implementation of CAVs and the associated agencies responsible for overseeing the action items.

updates to Chapters 26 and 31-33. Once publicly available, more information on CAV capacity adjustments will be available at https://www.mytrb.org/MyTRB/Store/Product.aspx?ID=8313

STATE DOT CAV READINESS

This section highlights the best practices of peer reviewed state DOTs that currently lead the CAV industry as well as a summary of DOT&PF's present CAV readiness.

Peer Review of State DOT Readiness

To understand the best practices in CAV preparation across the nation, the planning and programming activities of nine peer state agencies were reviewed. For detailed information, reference **Appendix A** – Technical Memorandum #1. Key findings of the best practices review include:

- Leading CAV working groups have organized goals by **realistic timeframes**: near term (<2 years), midterm (3–5 years) and longer term (6+ years).
- CAV working groups include participation and **collaboration** with various agency representatives and industry partners. Some focus groups are required by legislation.
- **Public engagement and education** can ease technology transitions and diffuse opposition, particularly around pilot programs, which can introduce skeptical populations to CAV technology in a gradual, temporary, and controlled manner.
- CAV guiding vision, business, or strategic plans are **updated on a regular basis**, often on a 3-year cycle.
- Many best-practice states have prepared and enacted **AV legislation**. See the 'Strategic Framework' section for specific examples.
- **Partnerships** with federal agencies, universities, and private technology companies have led to successfully securing funding for and implementation of pilot studies.

Current State of Alaska's Readiness for CAVs

In October 2020, the University of Alaska Anchorage (UAA), along with DOT&PF, prepared the *Self-Evaluation and Readiness of Alaska DOT&PF on Deployment of Connected and Automated (CAV) on Alaska Roads*.[6] The report concluded that "**Alaska is at an early stage of CAV readiness**" based on the USDOT Transportation Systems Management and Operations (TSMO)/CAV Capability Maturity Model framework. While eager to embrace the potential benefits that CAVs and other emerging technologies offer, the Alaska CAV Working Group is waiting to see how technologies develop to provide the best possible environment for successful CAV implementation **Table 1** summarizes the strengths, weaknesses, opportunities, and threats of Alaska's CAV Readiness.

[6] DOT&PF (2020). *Self-Evaluation and Readiness of Alaska DOT&PF on Deployment of Connected and Automated (CAV) on Alaskan Roads*.

Table 1. Alaska CAV Readiness SWOT Analysis

Strengths	Weaknesses

• CAV Working Group has formed
• CAV Working Group plans to regularly review and update this Strategic Plan Framework, which is critical to ensuring it reflects evolving technologies, department priorities, and current opportunities
• Alaska maintains strong working relationships with ITS/traffic signal private industry partners
	• Lack of:
	  ○ Dedicated funding for CAV planning, programming, and staff training
	  ○ Clear legislative direction
	  ○ Local CAV research center
	  ○ Local industry-leading partner
	  ○ CAV cybersecurity plan

Opportunities	**Threats**
• Continue learning from peer states • Maximize current initiatives (SPaT, RWIS, 511) • Support related technology initiatives in Alaska, such as EV charging infrastructure • Organize the growing CAV Working Group into focused subcommittees • Emphasize inexpensive staff trainings such as TRB, Automated Road Transportation Symposium, and the Consumer Electronics Showcase • Partner with private industry for agency staff training • Collaborate with agency partners to include CAV technology considerations into planning and policy documents • Challenge the private industry to demonstrate potential project benefits and share costs of pilots • Prioritize freight industry partnerships and existing infrastructure to support freight-focused pilots • Leverage existing DOT&PF platforms to engage with the public	• Legislative inaction • Conflicting local guidance • Public opposition • Data privacy and security concerns • Pace of technology development leads to obsolescence of built infrastructure • Flexibility with technology infrastructure investments and beware of proprietary technologies

STRATEGIC FRAMEWORK

To address Alaska's early stage of CAV readiness, the following sections outline how the existing CAV Working Group can progress its vision and goals while preparing for the future. Moving forward, the CAV Working Group should work to implement the following actions.

Connected and Automated Vehicle Working Group Recommendations

The CAV Working Group was established by the DOT&PF Commissioner in cooperation with the Municipality of Anchorage, metropolitan planning organizations (MPOs), other state agencies, and transportation organizations. The responsibilities of the CAV Working Group are defined as:

- Prepare, manage, and update a Strategic Framework (this Plan) that includes timelines, resources, goals, and implementable actions.

- Select and champion specific CAV efforts from the Strategic Framework.
- Review and recommend department agreements engaging with third parties on pilot studies or other partnering opportunities.
- Identify and champion national best practices to ensure that Alaska is following industry standards and best value investments.

The CAV Working Group meets quarterly and comprises representatives from numerous state and partner agencies and industries. Beyond the membership outlined in the CAV Working Group Charter, the CAV Working Group should invite representation from:

- Department of Public Safety
- Alaska Industrial Development and Export Authority (AIDEA)

Focus Area Subcommittees

Considering the size of the CAV Working Group and following the lead of several other states with large working groups, the CAV Working Group should organize into focus area subcommittees. These smaller subcommittees could tackle specific initiatives and report back to the larger group regularly at the standing quarterly meeting. Specific focus areas most relevant to the CAV vision and goals are:

The highest need subcommittees at this time are darkened for emphasis - the additional subcommittees should be phased in over time in response to technology developments, opportunities and as the size and composition of the CAV Working Group fluctuates. The workload and importance of each subcommittee likely also vary over time.

Appendix C provides roadmap plans detailing near-term and longer-term actions for each focus area subcommittee.

CAV Working Group Recommendations

It is recommended that the CAV Working Group pursue the following actions:

- Expand participation and organize into focus area subcommittees
- Learn from others through interstate collaboration and knowledge sharing
- Coordinate directly with the Electric Vehicle Working Group
- Champion regulation and policy recommendations
- Continue to lead future statewide CAV preparations

Inter-State Collaboration & Knowledge-Sharing

As Alaska's CAV readiness is still at an early stage, collaborating with peer states and prioritizing education throughout Alaskan agencies and communities will be crucial to the successful implementation of CAVs and other emerging technologies. **The Outreach & Education Subcommittee of the Alaska CAV Working Group should learn from and share with peer states by:**

- Continue contributing to and participating in FHWA Connected Vehicles Pooled Fund Study projects such as:
  - Connected Intersections Program
  - Multimodal Intelligent Traffic Signal Systems
  - V2I Concept Operations Development
- Continue contributing to and participating in NCHRP Research Projects, such as the 20-102 Series and the Special Committee on Research and Innovation.
- More actively participating in the Road User Charge Western Consortium (Alaska is a member as of 2019) for knowledge-sharing on alternative funding sources.
- Continuing to serve on the advisory board for the PacTrans University Transportation Center
- Contributing to and participating in AASHTO organized groups, such as:
  - Transportation System Operations Committee
  - Cooperative Automated Transportation Coalition (National Operations Center of Excellence)
  - Traffic Engineering Connected Vehicles/Autonomous Vehicles Subcommittee
- Monitoring relevant, ongoing pilot projects, such as:
  - Wyoming DOT Connected Vehicle Pilot on I-80[7]
  - Minnesota DOT Winter Weather Automated Shuttle Bus Pilot Project[8]
  - University of Iowa Automated Driving Systems for Rural America Project[9]
  - Sensible 4 Finnish Laplands AV Shuttle Pilot[10]
- Explore and pursue peer exchange opportunities to facilitate staff education

[7] Wyoming DOT Connected Vehicle Pilot. https://wydotcvp.wyoroad.info/

[8] Minnesota DOT Automated Shuttle Bus Pilot Project. http://www.dot.state.mn.us/automated/bus/index.html

[9] University of Iowa Automated Driving Systems for Rural America. https://adsforruralamerica.uiowa.edu/

[10] Sensible 4 Finnish Laplands Automated Vehicle Testing. https://cleantechnica.com/2020/12/09/harsh-finnish-lapland-is-setting-for-autonomous-driving-testing-video/

Electric Vehicle Working Group

As CAVs evolve, most leading researchers and manufacturers are building vehicles that are powered by electricity rather than the conventional internal combustion engine that runs on gasoline. The Alaska Electric Vehicle Working Group (AEVWG) under the Alaska Energy Authority is dedicated to smart and efficient electric transportation development. As electric and automated vehicles continued to develop simultaneously, the project team recommends that the **Industry Partnership Subcommittee of the CAV Working Group and the Alaska Electric Vehicle Working Group host joint meetings to share knowledge and information**. Charging infrastructure, as well as a resilient electricity grid, will be integral aspects of the successful deployment of CAVs, because most CAVs being developed today are electric. Early and frequent coordination between the two working groups will help to prioritize locations, non-propriety technology deployments, maintenance and operations responsibilities, and grant opportunities.

Regulation and Policy Recommendations

As technologies rapidly evolve, it will be key for plans, policies, and regulations to stay flexible and relevant. It will be important to establish a timely and recurring reevaluation of existing codes, policies, infrastructure bills, standards, and procedures to ensure desired behaviors are incentivized through agency actions.

Working Ahead of Technology

State governments are responsible for developing policy on licensing, registration, enforcement, liability, and insurance requirements for automated driving systems (ADS). The National Highway Traffic Safety Administration (NHTSA) is responsible for developing policy on ADS safety performance. To date, the State of Alaska has taken no specific legislative or executive action to prepare for CAVs, though many other states have.

While waiting to see what technologies develop and how they unfurl, Alaska should strive to progress policies, regulations, and laws ahead of technology rollouts by:

- Reviewing the recommendations published by the American Association of Motor Vehicles Administration (AAMVA) in the *Jurisdictional Guidelines for the Safe Testing and Deployment of Highly Automated Vehicles*
- Conducting a self-assessment of relevant state and local unique driving laws and advertising these peculiar laws to the industry so AV manufacturers know what to plan for
- Looking to and learning from other state regulatory actions
- Staying apprised of forthcoming rule-making guidance from AASHTO

ADS Technology Challenges

The reality is that some CAV technologies are already in Alaska. For instance, the Department of Motor Vehicles needs clarity on how to handle a student driver using automated parallel parking technology during a driving test.

Regulation Revisions

The Alaska Administrative Code (AAC) and Alaska Statues (AS) were reviewed to identify:

1. Existing code barriers to CAV technologies
2. Elements missing from the AAC and AS relevant to CAVs that other states have incorporated
3. Other code sections relevant or related to CAVs

Technical Memorandum #1 summarizes the legislative actions other states have undertaken related to CAVs and Technical Memorandum #2 lists specific AAC and AS sections identified for further consideration (available in **Appendix A** and **Appendix B**, respectively).

The Policy & Legislation Subcommittee of the CAV Working Group should review and work through potential code section revisions or additions in cooperation with the Department of Motor Vehicles, who have the authority to make changes to the AAC. Statute revisions require legislative sponsorship and approval. When strategic, the Alaska Department of Law can be consulted for a fee.

CODE ADDITIONS

Specific code additions that would provide clarity on AV technologies and potential avenues for future AV pilot testing based on pioneering efforts in other states would be:

- Adding specific definitions of AV technologies that may challenge conventional driver and vehicle definitions, such as the following terms:
  - Automated driving system
  - Dynamic driving task
  - Fully autonomous vehicle
  - System equipped vehicle
  - Driver-assistive truck platooning technology
- Creating exemptions for persons operating fully autonomous motor vehicles from the requirement to hold a driver's license and clarification on vehicle insurance requirements for fully autonomous motor vehicles.
- Outlining specific policies, processes, and procedures for pursuing approval and/or exceptions to standardize Alaska regulation of AV technology pilot testing. Examples include:
  - Requiring operators to submit a testing plan for review and approval prior to testing operations.
  - Specifying which state agency entity is responsible for reviewing and approving operator testing plans and operations.
  - Clarifying State authority in governing AV technologies as related to vehicle credentialing, licensing, insurance, and operations as well as preempting duplicative or conflict locality action.
- Codifying, via Administrative Order, the CAV Working Group minimum agencies for longevity and continued engagement as administrations change and technologies evolve.

C. OTHER CODE CONSIDERATIONS

In addition to specific code chapter revisions or additions relating to defining and regulating AV technologies, further rulemaking efforts modeled off of efforts by other state bodies include:

- Requirement that there be representatives of disadvantaged communities involved in AV programs, pilots, and the CAV Working Group, reflecting that AV technologies could be deployed first in fleet models serving as mobility on demand, and may specifically benefit members of rural communities, the elderly, those with disabilities, and low-income communities.
- Addressing data privacy and security concerns as they relate to AV technologies, in coordination with the Department of Commerce, Community and Economic Development, DMV, and legislature.

Policies & Planning

The CAV Working Group should work with partner agencies and departments to ensure that CAV technology considerations are incorporated into future planning and policy documents. NCHRP *Report* 924 provides guidance to agencies on how to develop flexible policies that will remain relevant as technologies evolve. This guidance includes a list of questions state and local agencies should review as they update their plans and policies. This flexible process for agencies planning and updating policies in this era of rapidly evolving technology is shown in **Figure 2.** The following sections summarize the NCHRP 924 process.

Figure 2. Transformational Technology Planning Process (NCHRP Report 924)

SELF ASSESS

- ☑ Review staff and equipment resources and capabilities; identify gaps for addressing technology questions.
- ☑ Review regulatory framework and local policies; identify barriers to addressing day-to-day technology challenges.
- ☑ Assess whether the Transportation Improvement Program (TIP) and Long-Range Transportation Plan (LRTP) support and take advantage of anticipated technology trends.
- ☑ Assess whether local land development applications consider anticipated technology trends.

GET DATA

- ☑ Bring new data sources into the planning processes.
- ☑ Establish partnerships with third-party data aggregation, anonymization, storage, and security firms to ensure cybersecurity of sensitive data from the connected network.

GET SMART

- ☑ Keep staff educated and up to date on new technologies.
- ☑ Establish program and funding criteria and evaluation based on data-driven performance metrics.

BE NIMBLE

- ☑ Update plans and regulations so they are more flexible in dealing with new technologies.
- ☑ Ensure that this framework can both adjust to, license, and permit emerging technologies and provide sufficient data to monitor trends.
- ☑ Establish a timely and recurring reevaluation of existing codes, policies, standards, and procedures to ensure desired behaviors are incentivized through agency actions.

CAV PREPARATION STRATEGIES AND ACTIONS

The following sections outline how the CAV Working Group can progress its vision and goals while preparing for the future. Moving forward, the CAV Working Group should work to implement the recommendations on future CAV preparations contained in this section.

Maximizing Current Initiatives & Leveraging Opportunities

CAV Working Group analyses, such as the SWOT analysis presented in the 'Current State of Alaska's Readiness for CAVs' section, help Alaska focus on strategic opportunities through its partnerships, relevant projects, and initiatives across the country. This section outlines how the CAV Working Group can maximize its current activities with an eye toward future pursuits.

Maximizing Current Initiatives

The CAV Working Group, specifically the Infrastructure Readiness Subcommittee, should work to maximize the current ITS and Iways initiatives and update the Strategic Framework regularly.

EXPANSION OF EXISTING ITS CAPABILITIES

Building on the existing intelligent transportation systems (ITS) technology that empowers the Alaska 511 Traveler Information System and the Road Weather Information System (RWIS), additional ITS-related activities could include cloud-based Automated Traffic Signal Performance Measures (ATSPM) and cloud-based Adaptive Signal Technology. These technology applications could have the potential to evolve into dynamic signal timing based on vehicle-to-infrastructure (V2I) information.

Alaska Iways

Launched in 2000, Iways is the state of Alaska's intelligent transportation system (ITS) program governed by the Alaska Iways ITS Architecture, which coordinates ITS projects. DOT&PF has adopted two ITS Implementation Plans for the Glenn and Seward Highways and is currently updating the Iways Architecture.

EXPANSION OF IWAYS

Recent Iways efforts as of 2021 include: Alaska 511 Traveler Information System, Online Vessel Tracking System, Alaska Land Mobile Radio (ALMR), Automated Vehicle Identification (AVI) Screening, Portable Message Boards (PMBs), Road Weather Information System (RWIS) Network, the Smart Snowblower/Snowplow, and the Traffic Management Center (TMC) Remote Access. Continuing to expand these Iways initiatives, as documented in Technical Memorandum #2 (**Appendix B**), will help to prepare Alaska for the connected and automated future.

STRATEGIC FRAMEWORK UPDATES

To ensure ongoing relevancy to the state of the industry as well as the needs of the Alaskan community, the **CAV Working Group should plan to update the Strategic Framework every 3–5 years.**

Staff Capabilities

To hire supporting positions for championing these efforts, agencies may need to rethink structure and typical hiring advertisements to attract data scientists and data/technology management-oriented staff. Additionally, low-cost training opportunities should be pursued for agency staff to stay in-the-know on up-and-coming technologies, federal policies, and other state CAV actions.

Triggers and Timeframes

Widespread implementation of CAVs will likely not occur for many years, despite industry hype that they are imminent. As detailed in the following Infrastructure section, there are varied components that will support the adoption of CAVs, such as communications, power, and other digital infrastructure as well as different timeframes for development and implementation that include fine-tuning for the deployment location. Typically, it takes years for transportation technologies to be developed, tested, refined, and widely implemented. **The Outreach and Education Subcommittee of the Alaska CAV Working Group should continue to monitor a variety of technology advancements.**

Infrastructure

CAVs are supported by ITS infrastructure, which can include sensors, communications equipment (such as fiber optic networks, DSRC, or 5G), and data analytics equipment and software. As CAVs progress and market penetration increases, agencies will need to invest in operating and maintaining physical and digital infrastructure, telecommunications, and power to ensure safe, efficient implementation. The following sections outline short- and long-term infrastructure investment recommendations. An in-depth analysis and discussion of infrastructure needs is available in **Appendix B** – Technical Memorandum #2.

Short Term Infrastructure Investment Recommendations

ROADWAYS: PHYSICAL & DIGITAL INFRASTRUCTURE

Readying Alaska's infrastructure for CAVs will include ongoing maintenance of the physical infrastructure, such as signage, striping, and pavement conditions. It will also include expanding the digital infrastructure of information and data sharing, mapping, monitoring, and storing. Agencies must continue to upgrade the traffic signal infrastructure as well as the digital connections between signal controllers, traffic management centers. **The Infrastructure Readiness Subcommittee of the Alaska CAV Working Group should pursue the following actions to ready Alaska's physical and digital roadway infrastructure for CAVs:**

- ☑ Collaborate with DOT&PF Maintenance & Operations regions to create a high-resolution reference system to guide signing and striping maintenance (as well as connected snow plowing).
- ☑ Collaborate with DOT&PF to strategically install real-time traffic sensors connected with the 511 Traveler Information system.
- ☑ Monitor and implement developing cybersecurity & data management best practices for all roadway digital infrastructure and supporting Big Data.

Long Term Infrastructure Investment Recommendations

COMMUNICATIONS & POWER

High-speed, low-latency communication is vital for the safe and efficient implementation of CAVs. The automated driving system on a CAV will benefit from the ability to send and receive data about traffic, weather, or roadway conditions from ITS equipment. **The Infrastructure Readiness Subcommittee of the Alaska CAV Working Group should pursue the following actions to ready Alaska's telecommunications and power infrastructure for CAVs:**

- ☑ Assemble a task force to evaluate Alaska's power and telecommunications needs, how to best integrate upgrades with roadway design standards, a standard detail for conduit, and the economic benefits of laying dark fiber or conduit to lease.
- ☑ Develop a 'Dig Once' Policy that provides guidance for state and local governments on agreements between telecommunications providers and roadway owner-operators to install conduit when reconstructing roadways.

Pilot Projects

Some CAV Pooled Fund Studies are currently addressing one of the most pressing barriers to implementation in Alaska: weather. With that in mind, initial pilot projects are likely to be led by the private industry to increase transportation efficiency and reduce costs. The following section outlines candidate pilot projects, pilot evaluators, selection criteria, and other considerations. It is anticipated that DOT&PF staff will serve as project managers, lead coordination with industry partners, and engage with the larger CAV Working Group for evaluating project proposals, as part of external coordination.

Candidate Pilot Projects

Pilot projects are an excellent way for agencies to acquire firsthand experience and develop their own lessons learned to share with others. While Alaska waits to learn from peer states, there will still be a learning curve to implementing CAV-supporting projects in Alaska. **Table 2** delineates the candidate pilot projects for the CAV Working Group to pursue that will help prepare agencies for CAV implementation.

Table 2. Alaska CAV Candidate Pilot Projects

Focus Area	Candidate Pilot Project
Safety Focus	Increase work zone safety through an automated truck-mounted attenuator to reduce worker exposure to crash risk. *Example: Minnesota DOT Office of Connected and Automated Vehicles Automated Truck Mounted Attenuator Project.*
Urban Mobility Focus	Implement a multimodal traffic signal priority system that could prioritize transit, freight, emergency vehicles, or maintenance vehicles. *Example: Georgia DOT Emergency Vehicle Preemption Pilot and Incident Responder Intersection Preemption.*
Rural Mobility Focus	Improve rural transit options through an ADA-compliant automated shuttle on a fixed route to serve Alaskans in need. *Example: University of Iowa's ADS for Rural America.*
Remote Freight Focus	Utilize connected vehicle technologies on fleet trucks along remote freight routes to share weather and roadway conditions information between vehicles. *Example: Texas Freight Connected Corridors.*
Tourism Focus	Enhance visitor mobility to Denali National Park through an automated shuttle between trailheads and visitor centers. *Example: The Yellowstone National Park TEDDY Pilot.*
	Partner with leading cruise operators to connect cruise docks with other transportation options or destinations through automated shuttles.

Project Evaluation & Screening

As technologies advance and vendors expand geographically, there will come a time for DOT&PF and the CAV Working Group to select, screen, and implement potential CAV pilot projects. The Florida Department of Transportation (FDOT) *CAV Business Plan*[11] identified CAV project evaluation and selection criteria, which can be used two-fold:

- For industry and vendor reference while developing technologies and pilot proposals
- For project selection, prioritization, and approval purposes by the CAV Working Group and DOT&PF

Table 3 shows proposed CAV pilot project feasibility screening questions, adapted from FDOT guidance for relevancy to Alaska. Whereas FDOT developed their criteria as an early leader in CAV technology testing, these project evaluation screening questions are focused on determining if the appropriate mechanisms are in place to safely test and monitor initial pilots. Pilot project proposals should be evaluated based on a high-level operational concept by the most relevant subcommittee or a subset of the CAV Working Group.

Table 3. Proposed CAV Pilot Project Feasibility Screening Questions

Categories	Screening Questions
Efficiency	Will this project directly/indirectly benefit efficiency/reliability for all modal users?
Safety	Will this project mitigate an established safety issue?
	Does the project have a safety operations plan?
	What is the failure mode, and is failure risk mitigated?
Equity	Will this project benefit all user groups equally?
	How will this project mitigate negative impacts?
	Have the people most impacted by the project been consulted?
Feasibility	Will this project be implementable (technology-ready), scalable, and portable?
	Do the proposed technologies adhere with applicable local, state, and federal regulations?
	What risks or threats to this project exist, and how will thee be mitigated?
Funds	Does this project utilize federal, local, and/or private funds? Is there an agreement/commitment in place?
Data Collection & Privacy	What data does this project collect, analyze, and utilize?
	How will the project protect the data and ensure privacy?
Project Support	Is there an established help/support system for this technology application?
	What are the project's performance metrics? How often will they be measured?
	Will there be continual analysis done (e.g., before and after, lessons learned, etc.)?
	Is there a systems validation and verification process in place? Explain.

[11] Florida Department of Transportation, Transportation Systems Management & Operations (FDOT). (2019). *Florida's Connected and Automated Vehicles (CAV) Business Plan*. www.fdot.gov

Technology Maturity Guidance

Pilot projects involving new technologies in Alaska will likely be tested on small scale. However, early adoption and widespread implementation of commercially available off-the-shelf technologies should proceed only once the technology maturity has been thoughtfully evaluated. Staff should stay apprised of forthcoming recommendations from the ENTERPRISE Pooled Fund Study for evaluating new technologies and best practices for future proofing emerging technologies. In the interim, guiding questions for agency staff to consider before widespread adoption of new technologies might include:

- ☑ Does this technology conform to mature standards and security protocols?
- ☑ Are manufacturers' representatives/technicians available to oversee installation?
- ☑ Is a help/support system developed for the application and available for support in Alaska?
- ☑ Can the technology demonstrate benefits to the transportation system in-line with the project cost?
- ☑ Does the technology have an expected lifetime of at least 10 years? Is it future-proof?
- ☑ Is there an ability to contract installation through competitive bidding?

Funding

As reported in the UAA Self-Assessment, funding was the second-most cited barrier to the implementation of CAVs. The state of Alaska has limited funds for transportation projects, which includes the testing and implementing of new transportation technologies.

A variety of federal grants are available to support investments in infrastructure that is advancing emerging technologies. USDOT offers the Connected Vehicle Equipment Loan Program and the Department of Energy, Office of Energy Efficiency & Renewable Energy and Vehicle Technologies Office offers the Energy Efficient Mobility Systems (FEMS) Program. These grants are highly competitive and are further complicated by the required local match for federal grants—typically, Alaska would contribute 10% of project costs and the federal agency funds the remaining 90%. However, some grants require higher local match values.

The Investing in a New Vision for the Environment and Surface Transportation in America (INVEST in America) Act is a reauthorization bill that is currently being debated in Congress. The draft bill allocates funding for emerging transportation technologies. If passed, new grant opportunities may become available to support CAV development and implementation. **The Policy and Legislation Subcommittee of the CAV Working Group should monitor the reauthorization legislation and look out for new funding and grant opportunities.**

CONCLUSION

CAVs are becoming more prevalent in today's environment, and this technology is transforming the nature of travel. While eagerly anticipating the potential benefits of CAVs, Alaska will monitor how these technologies develop and progress over time. Alaska intends to replicate best practices from leading states. Through the CAV Working Group, Alaska will continue to strategically prepare for the connected and automated future by pursuing the recommended actions.

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APPENDICES

- **A.** Technical Memorandum #1: Survey of Best Practices
- **B.** Technical Memorandum #2: Gaps & Needs
- **C.** CAV Focus Area Subcommittee Roadmaps

APPENDIX A – TECHNICAL MEMORANDUM #1

ALASKA DOT&PF
CONNECTED & AUTOMATED VEHICLE STRATEGIC PLAN

FINAL TECH MEMO #1

Date:	May 4, 2021	Project #: 25686
To:	Carolyn Morehouse, P.E. and Anna Bosin, P.E. DOT&PF	
From:	Andrew Ooms, P.E., Claire Dougherty, Rachel Grosso, and Abby Morgan, Ph.D., P.E.	
Project:	Alaska Connected and Automated Vehicle Strategic Plan	
Subject:	Survey of Best Practices in Early CAV Implementation	

PROJECT INTRODUCTION

We live in exciting times, as rapidly evolving technology is changing the way we travel and what trips we make. The Alaska Department of Transportation and Public Facilities (DOT&PF) is preparing for these impacts by developing a connected and automated vehicle (CAV) strategic plan.

This technical memorandum (Tech Memo #1) provides background on CAV technology, terms, and a summary of national guidance for regional and state planning agencies related to planning for the impacts of CAVs and other related technologies. This report also includes an overview of current CAV legislation, planning exercises, and pilot deployments underway in peer states; identifies best practices; and highlights key elements that may be relevant to DOT&PF and Alaska's unique characteristics.

Following the completion of the literature review, the project team will meet with key stakeholders and technical advisors to learn their vision, plans, and needs for preparing for CAVs. Tech Memo #2 will summarize the state's existing readiness and identify specific gaps and needs, which will aid in the development of a *CAV Strategic Plan* that addresses those gaps and challenges to adoption.

CONTENTS

KEY TERMS & DEFINITIONS

There are many new terms used to describe the evolving transportation industry. This section defines some of the key terms in the dialogue surrounding CAVs, which have the potential to transform how people and institutions use land and transportation systems to support economic and social activity (as defined by NCHRP *Report 924*). **Appendix A** provides additional terms and definitions. The CAV applications emphasized in this study focus on improving information sharing, personal mobility, or goods delivery (logistics), as illustrated in **Figure 1**.

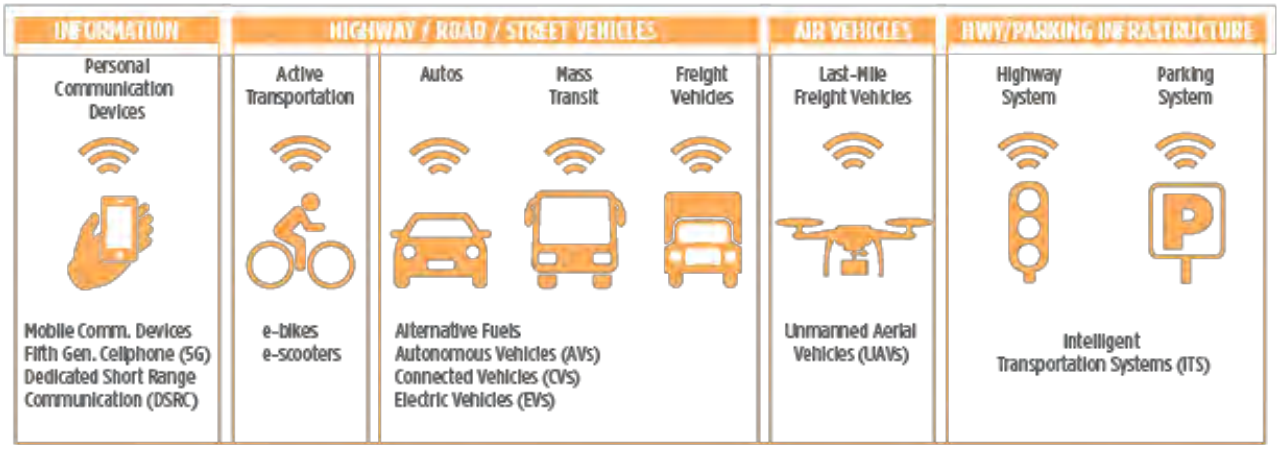

Figure 1. New Technologies Lead to New Applications
Source: NCHRP Report 924

Connected & Automated Vehicles (CAV)

The umbrella term 'connected and automated vehicles' (CAV) is often used to indicate varying levels of connectivity and automation—recognizing that these emerging technologies are being integrated to provide safety, mobility, and environmental benefits. While there is general agreement that the ultimate preferable configuration of vehicles of the future will be both connected and automated, the technologies that support these endeavors are developing both synergistically and separately. The US Department of Transportation (USDOT) produced the graphic in **Figure 2** to highlight how these technologies interact. Alaska DOT&PF is focused on strategically planning for connected and automated vehicles.

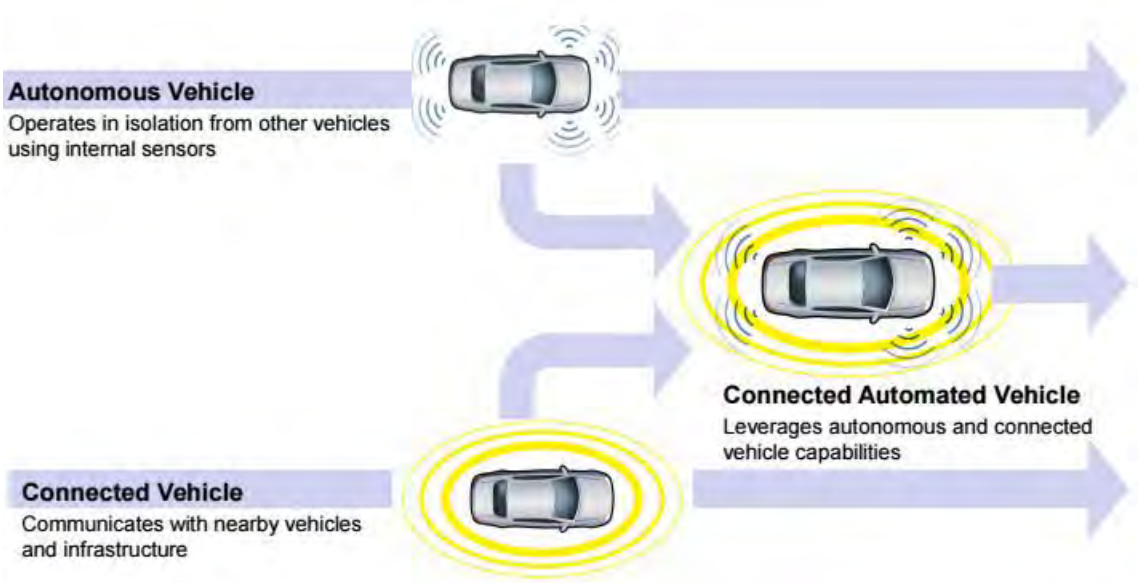

Figure 2. Automated Vehicles, Connected Vehicles, and Connected Automated Vehicles
Source: USDOT

The following definitions provide additional details on these key terms to highlight distinctions.

Connected Vehicle (CV)

A CV is a vehicle that can communicate with other vehicles, infrastructure, or other wireless technologies. CVs today typically communicate using Wi-Fi, the LTE or 5G network, or the dedicated short-range communication (DSRC) radio frequency. CVs use a variety of equipment to sense, collect, and transmit real-time data, such as road or traffic conditions, weather conditions, vehicle speeds, etc. There are three key types of vehicle communications:

- V2V: Vehicle to vehicle communication
- V2I: Vehicle to infrastructure communication
- V2X: Vehicle to Internet-of-Things (IoT) communication

Intelligent Transportation Systems (ITS)

In general, CVs are supported by ITS infrastructure, which can include sensors, telecommunications equipment (such as fiber optic networks or DSRC), and data analytics equipment and software. ITS is a system in which information and communication technologies are applied to road transportation, including infrastructure, vehicles, and users, in traffic and mobility management. Intelligent transportation systems include a variety of safety, mobility, and efficiency impacts. As CAV pilots and deployments become more widespread and common, the policies that support and the infrastructure that provides ITS services will become increasingly important to the success of CAVs. Some examples of ITS technologies include:

- Road Weather Information System (RWIS)
- Remote Traffic Signal Monitoring
- Connected Snow Plowing
- Multimodal Traffic Detection
- Emergency Vehicle Notification Systems

- Automatic Road Enforcement
- Variable Speed Limit Systems
- Collision Avoidance Systems (both infrastructure and in-vehicle)

Automated Driving System (ADS)

An automated driving system (ADS) on a vehicle can itself perform some aspects of the driving task under certain circumstances, though it still requires human driver alertness and engagement. The National Highway Traffic Safety Administration (NHTSA) maintains an ADS deployment tracking tool that displays testing locations on an interactive map. https://www.nhtsa.gov/automated-vehicles-safety/av-test-initiative-tracking-tool

Automated Vehicle (AV)

Also known as driverless cars or self-driving vehicles, AVs are equipped with sensors (for example: cameras, radar, LiDAR, computer vision, and/or GPS), which allow onboard computers to ***perform*** some or all driving tasks. The AV industry is currently categorized by the levels of automation as defined by the Society of Automotive Engineers (SAE) and the National Highway Traffic Safety Administration (NHSTA), displayed in **Figure 3**. However, as the industry progresses, these terms are beginning to evolve, with AVs encompassing the current Levels 4 and 5, and advanced driver-assistance systems (ADAS) covering Levels 1 and 2. Although some progress has been made toward the current Level 3, a 'Conditional Automation' approach presents the thorniest human factors, liability, insurance, and law enforcement issues.

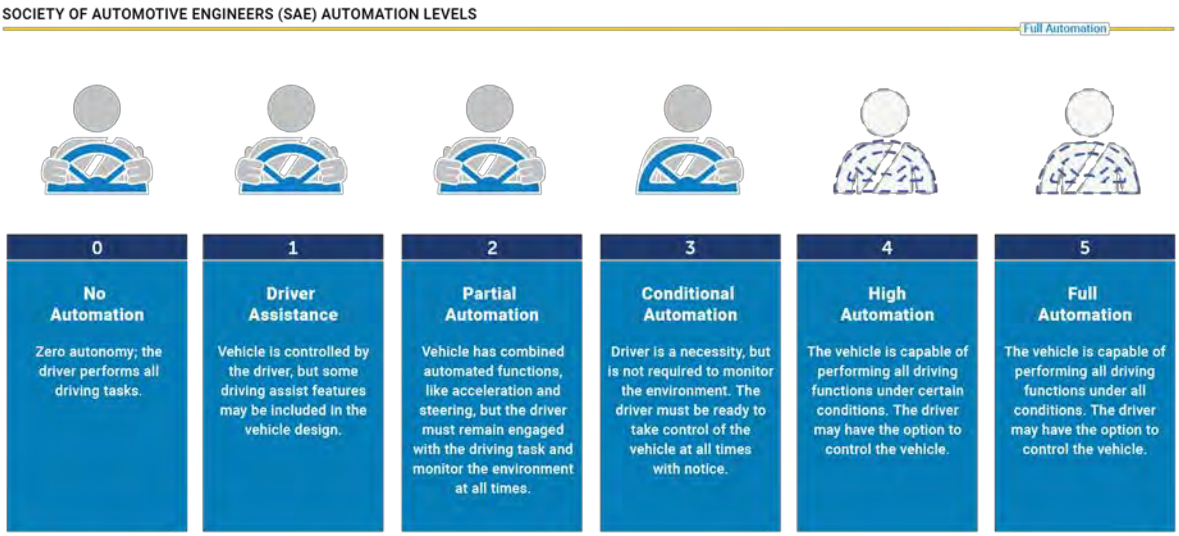

Figure 3. Five Levels of Automation

Source: Society of Automotive Engineers (SAE) and National Highway Traffic Safety Administration (NHTSA)

Advanced Driver-Assistance Systems (ADAS)

ADAS are specific features that ***assist humans*** with the driving task. Most ADAS features are safety-related (such as automatic emergency braking), but some are designed to simplify the driving task (such as automatic parking and adaptive cruise control). Many ADAS features are already commercially available in cars, trucks, and buses. These include, but are not limited to:

- Automatic Parking
- Lane Keep Assistance
- Adaptive Cruise Control
- Automatic Emergency Braking
- Anti-Lock Braking Systems
- Electronic Stability Control
- Blind Spot Monitoring

GUIDANCE ON PLANNING FOR EMERGING CAV TECHNOLOGIES

In the past few years, several guidebooks have been published to provide agencies with best practices for incorporating emerging technologies, especially CAV technologies, into planning practice. Highlighted documents are NCHRP *Report 924* and NACTO *Blueprint for Autonomous Urbanism,* which are summarized in the following sections for their key best practices guidance.

NCHRP 924 FORESEEING THE IMPACT OF TRANSFORMATIONAL TECHNOLOGIES ON LAND USE AND TRANSPORTATION

Potential Impacts of CAVs

New technologies and their applications to transportation, such as CAVs, may impact travel and land use by reducing the time cost of travel compared to other modes, reducing the monetary cost of travel compared to other modes, or making new travel options available. The potential impacts of CAVs are varied and subject to technology development, market direction, infrastructure, and policy guidance. The impacts discussed in this section are broad and will likely change. As they develop, further refinement to planning strategies will be necessary to amplify or mitigate these impacts.

In 2019, NCHRP published *Report 924*, which provides a comprehensive assessment of transformational CAV technologies and their potential impacts on travel, policy and planning challenges, and special considerations unique to rural areas. Anticipated impacts include:

Safety and Liability

- CAVs are expected to reduce the frequency of crashes and their human toll.
- Relatedly, unexpected delays due to crashes would also be reduced, which would improve travel time reliability.
- Overall crash costs will likely decrease as crash frequency or severity decreases. However, the cost to consumers or insurance agencies may increase due to the repair and replacement costs of expensive sensor equipment when crashes do occur.
- Insurance needs might change as CAV manufacturers may need to acquire insurance to cover automated system failures that lead to a crash.
- Responsibility of insuring shared vehicles or fleets may fall to the vehicle owners rather than the individual driver/user.

- Agencies must evaluate evacuation procedures and redundancies in the local network with respect to CAVs, shared vehicles, and electric vehicles to prepare for emergency situations.

Travel Demand

- Travel demand models and scenario planning efforts should reflect various CAV technology adoption scenarios and rates.
- Vehicle miles traveled (VMT) might increase with higher CAV adoption rates.
- The combined technologies of connected, automated, electric, and shared-used vehicles have the potential to lower trip costs, lower trip times, lower/eliminate parking costs, increase access, decrease wait times/increase travel time reliability, and lower vehicle purchase costs in urban areas. These metrics likely would increase travel demand.

Roadway Systems

- Capacity may increase due to shorter headways with high adoption rates of both connected and automated vehicles. Agencies can follow guidance for planning for capacity impacts by using the capacity adjustment factors for CAVs provided in the recent update to the *Highway Capacity Manual*, *Sixth Edition: A Guide for Multimodal Mobility Analysis (HCM)*[1].
- For freight and longer passenger trips, platooning (the movement of a fleet of vehicles controlled as one unit by CAV technology) is expected to reduce travel time by optimizing the distance between trucks in a platoon, which reduces air drag and allows for more vehicles on the roadway.

Transit Systems

- Ride-hailing and ridesharing services have increased in popularity and trip share. Fixed route bus transit use has decreased nationwide, partially as a result of increased shared use services, while rail use has increased.
- In an increasingly shared and connected transportation system, traditional transit systems will most likely adopt CAV technologies to increase mode split and trip share.
- Mobility as a Service, Microtransit, and Bus Rapid Transit will become increasingly prevalent as transit agencies upgrade their fleets to incorporate available CAV technologies.
- These new services should positively impact first- and last-mile connections, night and weekend service hours, sparsely populated areas, and Americans with Disabilities Act (ADA) paratransit service provisions.

Funding

- Automated, Connected, Electric, and Shared-Use Vehicles (ACES) have the potential to **reduce funding** from the following sources: traffic violation revenue (shared, connected, automated), motor fuel tax revenue (electric), vehicle registration revenue (shared), or parking revenue (shared, connected, automated).

[1]Though not yet formally published, the TRB Highway Capacity and Quality of Service committee is in the process of reviewing and approving updates to the *HCM 6th Edition*, including the addition of CAV capacity adjustment factors updates to Chapters 26 and 31-33. Once publicly available, more information on CAV capacity adjustments will be available at https://www.mytrb.org/MyTRB/Store/Product.aspx?ID=8313

- ACES also have the potential to **provide funding** from new sources: road usage fees based on VMT, technology taxes, or non-shared ride fees.

Equity

- Though many emerging CAV technologies may seem more urban centric, **rural areas experience unique challenges** such as weather and terrain extremes, high-speed traffic, and higher traffic fatality rates that provide even more reason for considering advancing intelligent transportation systems in more rural areas. Ongoing rural-focused CAV pilot testing includes:
  - Several DOTS, including Alaska and Nevada, are testing dedicated short-range communications on snowplows for weather condition data involving onboard instruments, roadside units, and DSRC. http://www.dot.state.ak.us/iways/proj-smartsnowplow.shtml, https://www.dot.nv.gov/mobility/avcv
  - The *Wyoming Connected Vehicle Pilot* across Interstate 80 is utilizing communication between on-board truck cab units and roadside units (RSUs) to provide real-time driver alerts about road closures, wind warnings, speed warnings, and truck parking information. https://wydotcvp.wyoroad.info/
  - The University of Iowa's *ADS for Rural America* pilot is looking to improve the safety and enhance rural transportation options for mobility impaired populations by running an autonomous ADA-compliant mini-bus shuttle on a 47-mile loop in rural Iowa. https://adsforruralamerica.uiowa.edu/
- AV technologies are likely to be deployed first in fleet models serving as mobility on demand. Therefore, the vehicles must include universal design features to accommodate **all potential users, including people with disabilities.**

Infrastructure Needs to Support AV Deployment

- Telecommunications equipment and connectivity, as well as secure RSUs to communicate road and weather information to AVs.
- Improved signing and striping—Standardized, well-maintained pavement markings have been identified by the FHWA as a key element of highway infrastructure contributing to safe AV deployment as well as to improve the real-life performance of early ADAS.
- Standardized management of road- and traffic- relevant data to make it more accessible to potential users.

Policy Guidance

According to NCHRP *Report 924*, the key guiding themes for agencies planning in this era of rapidly evolving technology are as shown in **Figure 4**.

Figure 4. Transformational Technology Planning Themes
Source: NCHRP Report 924

Self-Assess

- Review staff and equipment resources and capabilities to identify gaps for addressing technology questions within the agency.
- Review regulatory framework and local policies to identify barriers to addressing day-to-day technology challenges and administrative barriers.
- Assess whether the Transportation Improvement Program (TIP) and Long-Range Transportation Plan (LRTP) support and take advantage of anticipated technology trends.
- Assess whether local land development applications consider anticipated technology trends.

Get Data

- Bring new data sources into the planning processes.
- Establish partnerships with 3rd party data aggregation, anonymization, storage, and security firms to ensure cybersecurity of sensitive data from the connected network.

Get Smart

- Get staff smart on new technologies.
- Establish program and funding criteria and evaluation based on data-driven performance metrics.

Be Nimble

- Update plans and regulations so they are more flexible in dealing with new technologies.
- Ensure that this framework can both adjust to, license, and permit emerging technologies and provide sufficient data to monitor trends.
- Establish a timely & recurring reevaluation of existing codes, policies, standards, and procedures to ensure desired behaviors are incentivized through agency actions.

NACTO BLUEPRINT FOR AUTONOMOUS URBANISM

Released in 2019, the second edition of the NACTO *Blueprint for Autonomous Urbanism* focuses on how the autonomous future will be shaped by the policy and design decisions made today. The guiding principles of autonomous urbanism presented in the document are:

- **Design for Safety** – Safety must remain at the forefront of both public- and private-sector decision making.

- **Move People Not Cars** – Agencies and technology producers must prioritize modes that move people efficiently.
- **Distribute the Benefits Equitably** – Land use and policy decisions made today will be essential to ensure the benefits of AV technologies are equitable shared.
- **Data-Driven Decision Making** – Agencies must maintain access to existing transportation data and find ways to utilize the data generated by new technologies.
- **Technology is a Tool** – AV technologies are tools to achieve better transportation outcomes.
- **Act Now!** – To ensure that AV technologies augment agency goals.

More specific guidance tailored to local agencies is also detailed regarding transit, congestion pricing, data, and urban freight opportunities as well as planning and designing streetscapes for the future.

ADDITIONAL GUIDANCE DOCUMENTS

Additional CAV planning resources include:

- USDOT *Ensuring American Leadership in Automated Vehicles Technologies: Automated Vehicles 4.0*, 2021
- National League of Cities' (NLC) *Autonomous Vehicles Policy Preparation Guide*, 2019
- National Association of Counties (NACo) *Connected and Automated Vehicles Toolkit: A Primer for Counties*, 2019
- NCHRP *Report 845: Advancing Automated and Connected Vehicles: Policy and Planning Strategies for State and Local Transportation Agencies*, 2017
- USDOT *Connected Vehicle Impacts on Transportation Planning*, 2015

REGULATORY AUTHORITY AND AGENCY GUIDANCE

The USDOT and NHTSA outlined the distinction between federal and state regulatory roles regarding motor vehicle operations in *Automated Driving Systems: A Vision for Safety 2.0*, as summarized in **Figure 5**. At the federal level, the NHTSA is developing policy on ADS safety performance, while state governments are responsible for developing policy on licensing, registration, enforcement, liability, and insurance requirements for ADS.

NHTSA'S RESPONSIBILITIES	STATES' RESPONSIBILITIES
• Setting Federal Motor Vehicle Safety Standards (FMVSSs) for new motor vehicles and motor vehicle equipment (with which manufacturers must certify compliance before they sell their vehicles)[33] • Enforcing compliance with FMVSSs • Investigating and managing the recall and remedy of noncompliances and safety-related motor vehicle defects nationwide • Communicating with and educating the public about motor vehicle safety issues	• Licensing human drivers and registering motor vehicles in their jurisdictions • Enacting and enforcing traffic laws and regulations • Conducting safety inspections, where States choose to do so • Regulating motor vehicle insurance and liability

Figure 5. Federal and State Regulatory Roles
Source: USDOT, Automated Driving Systems 2.0.

More than 30 states have enacted legislation related to automated vehicles (displayed in **Figure 6**). Most of these states modeled their rulemaking after the recommendations published by the American Association of Motor Vehicles Administration (AAMVA) in the *Jurisdictional Guidelines for the Safe Testing and Deployment of Highly Automated Vehicles*. Though not *required* of states, AAMVS provides guidance to agencies planning for AVs relating to:

- Administrative Consideration
- Vehicle Credentialing
- Driver Licensing
- Law Enforcement

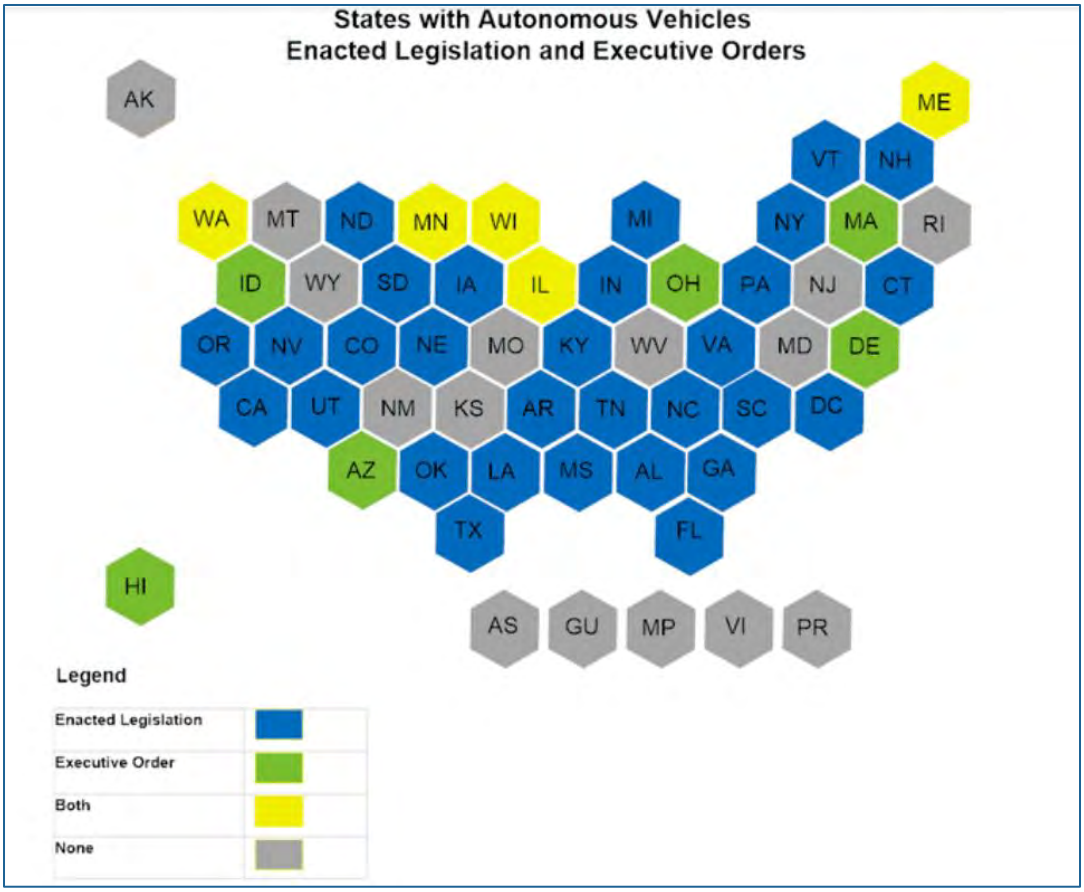

Figure 6. States with Enacted Legislation for Automated Vehicles as of February 2020
Source: National Conference of State Legislatures (NCSL) Autonomous Vehicles Legislative Database

A limited number of states have begun specifically considering AV accessibility for people with disabilities, either through a task force or legislation recommendations and/or requirements for engaging with the disability community about AV programs, pilots, and technologies. Specific state actions are discussed further in the following section.

SUMMARY OF KEY FINDINGS FROM LEADING STATE AGENCIES

The CAV preparation activities of nine best practice state agencies were reviewed, as described in-depth in the following section. This section highlights the key findings of the best practices literature review for Alaska DOT&PF consideration.

- CAV working groups have set specific **visions and goals** regarding CAV technologies, often relating back to bigger-picture statewide transportation goals such as safety, mobility, reliability, and economic benefit. See **Appendix B** for more information.
- CAV working groups include participation and **collaboration** with various agency representatives and industry partners. Some focus groups are required by legislation.
- Leading CAV working groups have organized goals by **realistic timeframes**: near term (<2 years), midterm (3–5 years) and longer term (6+ years).
- **Public engagement and education** can ease technology transitions and diffuse opposition, particularly around pilot programs, which can introduce skeptical populations to CAV technology in a gradual, temporary, and controlled manner.
- CAV guiding vision, business, or strategic plans are **updated on a regular basis**, often on a 3-year cycle.
- Many best-practice states have prepared and enacted **AV legislation**. See **Appendix C** for specific examples. Common elements addressed via legislation or governor order include:
    - Definition of AV technologies
    - Specific licensure, registration, and insurance requirements
    - Policies and procedures for testing and regulating CAV deployments
        - Note that state and local agencies do not have authority to regulate the testing of CAV performance. Agencies can evaluate the deployer/operator's performance, but not the vehicle itself (only the NHTSA has authority to do this).
    - Prevention of local authorities from prohibiting CAV use
    - Recommendation or requirement that representation of the disability community be involved in AV programs, pilots, or task forces
- **Partnerships** with federal agencies, universities, and private technology companies have led to successful securing of funding for and implementation of pilot studies.

DETAILED STATE CAV RELATED ACTIONS, PLANS AND LEGISLATION

Several state agencies have begun to develop technology transition plans or business plans for adapting to CAVs. This section highlights the best practices of several states that have been early adopters of creating and implementing CAV strategic or business plans, conducting pilot programs, and partnering with private industry. The nine states reviewed and summarized below are:

- Florida
- Georgia
- Iowa
- Kansas
- Maryland
- Massachusetts
- Michigan
- Minnesota
- Utah

FLORIDA

Florida is a leading state in testing CAV technology, as it was the second state in the nation to authorize testing (Nevada being the first). There are many past, current, and planned CAV technology projects across the state, which are detailed on the Florida Department of Transportation (FDOT) Connected and Automated Vehicle Initiative webpage (https://www.fdot.gov/traffic/its/projects-deploy/cv/connected-vehicles). In 2015, FDOT established the AV/CV/ITS Steering Committee to coordinate and provide leadership direction over FDOT's statewide and regional initiatives. The committee was responsible for developing a strategic plan, drafting design standards for major infrastructure investments, initiating additional testing facilities, forming new non-traditional partnerships, and prioritizing investment locations. Since 2016, all state planning documents must consider the impacts of CAVs. *Florida's Connected and Automated Vehicles Business Plan* (2019) identifies Transportation System Management & Operations (TSMO) to be crucial to CAV deployment, while establishing a CAV vision focused on safety, mobility, and economic development. The *Strategic Business Plan* highlights priority focus areas of:

- Policies and Governance
- Program Funding
- Education and Outreach
- Industry Outreach and Partnerships
- Technical Standards and Specifications Development
- Implementation readiness
- Deployment and Implementation

These focus areas are coupled with a CAV Implementation Roadmap that consists of three phases: Initialization, Early Implementation, and Full-Scale Implementation and Operations. As FDOT continues to endeavor in its CAV deployment and implementation, all seven focus areas and their associated action items are underway. As part of their *CAV Business Plan*, FDOT developed project selection criteria and performance measures for CAV projects that address CAV adoption acceleration, safety, mobility, efficiency, reliability, feasibility, funds, benefit/cost ratio, data, security, operations, and maintenance.

Figure 7 showcases the FDOT-developed CAV project criteria, which is intended to serve as general guidance in the development of CAV deployment projects as well as for agency use for project prioritization and selection.

Categories	Criteria	Self-Score
Accelerate the CAV Program	Does this project accelerate the deployment and implementation of CAV technologies in Florida?	
Safety	Does this project directly reduce or have the potential to reduce fatal, serious injury and/or secondary crashes?	
Mobility	From a mobility perspective, does this project directly benefit all modes including pedestrians, bicyclists, disabled, economically disadvantaged, and aging road users?	
Efficiency and Reliability	Does this project directly benefit (or have potential to impact) efficiency and/or reliability for all travelers, freight, transit riders, aging road users, pedestrians, and bicyclists?	
Feasibility	Is this project implementable (technology-ready), scalable, and portable for statewide deployment?	
	Do proposed technologies comply with or have the potential to comply with relevant state and federal safety law?	
	Is the proposed project interoperable and/or does it have the potential to become interoperable with the existing or programmed CAV Projects?	
Funds	Does this project leverage federal, local, and/or private funds? Are there any private organization and/or local agency partners? If yes, what are their match types and roles? Is there an agreement or Memorandum of Understanding (MOU) in place?	
Benefit/Cost	Does this project offer benefits with a high B/C and a good return on investment?	
Data and Security	Does this project collect, disseminate, and use real-time traffic, transit, parking, and other transportation information to improve safety and mobility, and reduce congestion? Explain how the project will safeguard data privacy and deploy a cybersecurity platform.	
Operations and Maintenance	Does this project address staffing, funding, and procedures for operations, maintenance, and replacement of CAV infrastructure, technologies, and applications?	
Project Evaluation	Does this project have pre-defined performance measures? What and how are these outcomes measured?	
	Will there be a before and after analysis performed, and lessons learned documented? If yes, how will this be documented and shared?	
	Is there a systems validation and verification process in place? Explain how this will be performed.	
	Total Score	

Figure 7. CAV Deployment Project Selection Criteria and Scoring Matrix
Source: FDOT CAV Business Plan

The FDOT Office of Policy Planning's *Guidance for Assessing Planning Impacts and Opportunities of Automated, Connected, Electric, and Shared-Use (ACES) Vehicles* (2018) provides instruction for state, regional, and local agencies to incorporate these emerging technologies into the transportation planning process. This guide focuses on scenario planning to identify and educate on the impacts of ACES, in terms of:

- Consumer Acceptance
- Deployment Timeframe
- Economy
- Environment
- Land Use
- Mode Choice
- Parking
- Safety
- Transportation Funding
- Vehicle Miles Traveled

Legislation

The chronology of state legislation in Florida regarding CAV technologies is as follows:

- FL H 1207 (2012) – Defined "autonomous vehicle" as applicable in Florida Statutes Sections 316.003, 316.85, and 319.145, for traffic control, licensing, registration, and operation.
- FL B 7027 (2016) – Defined "driver-assistive truck platooning technology" and appropriated funding for FDOT to study the operation of truck platooning via a pilot deployment. Also removed a requirement that a human operator be present in an autonomous vehicle for testing purposes.
- FL B 7061 (2016) – Amended Florida Statutes Section 316.85 to allow for the testing of AVs on public roads with an operator physically in the vehicle.
- FL H 311 (2019) – Amended Florida Statutes Section 316.85 to allow for the operation (testing and deployment) of AVs on public roads without an operator physically in the vehicle.
- FL SB 2500 (2019) - Appropriated funding for the study and development of innovative transit options, including AV service, in the Tampa Bay Region.
- FL 7068 (2019) – Created the FDOT Multi-use Corridors of Regional Economic Significance Program to advance the construction of regional multimodal corridors for ACES.

GEORGIA

The Georgia Department of Transportation (GDOT) first prepared a *Connected Vehicle Deployment Plan* in 2016 to serve as a roadmap. The initial 2016 plan specified a five-phase deployment approach, with the intent being that the deployment plan would be updated at the conclusion of each phase. As such, the 2016 plan has been expanded on with a supplemental *Concept of Operations*, *Application Deployment Plan*, and an *RSU Testing Summary.* The Plan was used as justification for the state's first pilot effort in 2017, which was pursued in response to an American Association of State Highway and Transportation Offices (AASHTO) Signal Phasing and Timing (SPaT) Challenge. The intent of the original 2017 CV pilot deployment was to establish V2I communications and was a traffic signal-based application demonstration focused at 54 intersections. The success of the pilot led to regional expansion in 2018, which signaled a transition from a pilot to a programmatic deployment of equipment across the region. In 2019, the expansion was further supported by funding and federal partnership with USDOT,

followed by additional local participation in 2020 through the Atlanta Regional Commission (ARC) Partnership.

As of September 2020, there were 565 licensed and installed RSUs with dedicated short-range communications (DSRC) and 6 locations that also have cellular vehicle-to-everything (C-V2X) capabilities. Active ongoing pilot applications using the installed technologies include:

- Emergency Vehicle Preemption Pilot
- Transit Signal Priority Pilot
- Freight-Centered Pilots with Georgia Ports Authority
- Incident Responder Interchange Preemption

GDOT plans to expand the connected vehicle regional deployment to 1,600 traffic signals in the metro-Atlanta area in 2021, including expanding the number of sites with C-V2X capabilities.

Legislation

The Georgia state legislature enacted 2 bills in 2017 addressing automated driving technologies:

- SB 219 – Adds specific definitions relating to automated driving technologies, exempts persons operating fully autonomous motor vehicles from the requirement to hold a driver's license, adds a requirement in the case of a crash for the vehicle and operator to contact local law enforcement and to remain on the scene, specifies insurance requirements, and includes a provision that no rules or regulations shall be adopted that limit the authority to operate such vehicles or systems.
- HB 472 – Provides an exception to the previously legislated requirements for coordinated platoon vehicles utilizing V2V technologies, specifying that the law prohibiting following too closely does not apply to a coordinated vehicle platoon.

IOWA

Iowa has established an Advisory Council on Automated Transportation (ATC), which is chaired by the Iowa Department of Transportation (Iowa DOT) Director. In 2019, Iowa DOT released its *Cooperative Automated Transportation (CAT) Service Layer Plan*, which relates to and expands upon its approach to CAT technologies outlined in its *Transportation System Management and Operation (TSMO) Strategic Plan.* The ATC and Iowa DOT developed the *Iowa Automated Transportation (AT) Vision Plan* in 2020, which formalized the ATC Strategic Objective Areas:

1. Infrastructure Readiness
2. Policy & Legislation
3. Economic Development
4. Public Safety & Enforcement
5. Communication, Outreach & Education
6. Research Development, Testing & Evaluation

The ATC is organized into subcommittees relating to each of the objective areas. The subcommittees are led by subject matter experts.

Iowa has multiple ongoing corridor planning studies with goals of advancing CAT technologies made possible through partnerships with Iowa DOT, HERE Technologies, the University of Iowa, and Iowa State University. To date, the studies have resulted in the development of an infrastructure data specification document and testing of mobile and in-dash C2X hazard alerting, with plans to create a queue detection pilot program and to test tools related to work zone activities.

The National Advanced Driving Simulator (NADS)—part of the University of Iowa and the Iowa Technology Institute—is actively planning the ADS for Rural America Pilot to begin in Iowa during Summer 2021. The USDOT-funded shuttle pilot seeks to improve the safety of and enhance rural transportation options for mobility impaired populations by operating an automated ADA-compliant mini-bus shuttle on a 47-mile loop in rural Iowa. The shuttle bus will be outfitted with custom technologies that allow for varying levels of automation and is being developed in conjunction with partners AutonomouStuff and Mandli Communications.

Legislation

In May 2019, the Governor of Iowa enacted Senate Bill 302, which added definitions related to driverless vehicles and made traffic penalties applicable. While more specific automated driving system rulemaking is an ongoing effort by ATC stakeholders and legislative committee, elements that are anticipated to be included in a new chapter of the vehicle code dedicated to driverless-capable vehicles are:

- Definitions
- Contact Information
- Identification in Registration
- Operational Restrictions
- Identification of Vehicle Networks
- Testing Permits

KANSAS

The Kansas Department of Transportation (KDOT) established a Statewide Connected and Autonomous Vehicle Task Force in 2018, which prepared a *CAV Vision Plan* in 2019 to document the Task Force mission, vision, and goals. The collaborative task force included representation from several state departments. The CAV Vision Plan comprised individual blueprints for state agencies, including the Department of Transportation, Department of Commerce, Department of Emergency Management, Information Security Office, Legislature, and State Highway Patrol, among others, who were all surveyed during the development of the plan. The succinct two-page blueprints for each agency identify the following:

- CAV Challenges and Opportunities
- System Needs
- Strategies
- Cost, Funding and Partnership Opportunities
- Timeframe
- Immediate Key Actions
- Performance Measures
- Contact Person

Additionally, the *CAV Vision Plan* identifies near-term (3-year) Kansas initiatives and projects and specific short term legislative actions based on other states' legislative experience, ultimately recommending Kansas take the following legislative actions:

- Formalize the CAV task force,
- Standardize Kansas regulation of CAV testing or deployment by preempting duplicative or conflicting county or municipal action,
- Promote partnerships with state colleges and universities,
- Set policies and procedures for testing and regulating CAV deployments, and
- Engage with the state's Congressional delegation to ensure that Kansas CAV needs and preferences are not negatively affected by ongoing US Congressional efforts to advance and pass an omnibus CAV bill and/or follow-on legislation.

The CAV Task Force has since moved forward with preparation of a *CAV Implementation/Strategic Plan*, which is an ongoing effort. In the meantime, Kansas is moving forward with a few specific projects in support of the Kansas CAV goals, including:

- RSU communication with Kansas DOT maintenance trucks to collect maintenance vehicle data.
- A wind warning system on Interstate 70 to caution high-profile truck tractor drivers.
- Upgrading the state's fiber optic network to better facilitate data transfer.
- Launching a truck parking information system.

Legislation

Kansas has not enacted any CAV-related legislation.

MARYLAND

In 2015, the Maryland Department of Transportation (MDOT) formed their Connected and Automated Vehicle Working Group. The Maryland CAV Working Group includes over 300 representatives of elected officials, state and local agencies, highway safety organizations, non-transportation experts, academia, and private sector technology and auto manufacturing firms, as well as various transportation experts throughout the state. With four subgroups—Technical, Policy, First Responders, and Freight—the working group has, since its formation, led the creation of a family of plans that have guided the continued preparation for, and research and deployment of, CAVs in the state of Maryland. Their first *Strategic Action Plan*, developed in 2017, identified the goals of becoming an attractive partner for CAV development, testing, and production; gaining experience through deployments; and establishing strong foundations in planning, engineering, policy, and infrastructure to support CAVs. Described as "somewhere between a master plan and a deployment plan," this document created the initial vision to guide the State Highway Administration (SHA) for the statewide research, adoption, and implementation of CAV technologies. Crucially, this plan outlined a series of recommended actions to further MDOT SHA's vision and goals, including:

- Identify, plan for, and implement the foundational needs of a CAV Program:
    - Telecommunications
    - Road Markings & Signage
    - Policy & Legislation
    - Data Governance

    - Staffing/Skills Development
- Implement Pilot Programs to Build Experience & Attract Partners
- Partner for & Support CAV Testing

In 2018, the Maryland Transportation Authority (MDTA), the state's primary toll-collecting agency, released its follow-up *Strategic Plan for Connected & Automated Vehicles*, which further refined aspects of the 2017 plan while outlining the specific role that MDTA plays in the development of CAV technologies in Maryland. As a strengthening element in the family of plans, this plan further expanded on MDOT's *Communications Strategy* while also highlighting the importance of the *2017 ITS Strategic Plan*. Furthermore, this plan expands on the purpose, roles, and functions of the CAV working group, which includes evaluating research; tracking federal and state laws, policies, and programs; promoting internal awareness and communication; facilitating external communication and education; and coordinating with agencies, organizations, and businesses to steer the course for the future of CAVs.

The 2017 Strategic Plan included 35 actions for MDOT to begin pursuing, of which 26 were advanced throughout 2018 and 2019. As detailed in annual reports produced by the CAV Working Group, the actions range from public education and outreach to infrastructure and workforce development, including planning and policy as well as early deployment and testing. In 2020, MDOT released the Maryland *Connected & Automated Vehicle Strategic Framework*, which solidified the Vision for CAV in Maryland, as to

> "Uphold and enhance a safe, efficient, and equitable transportation future by delivering collaborative and leading-edge CAV solutions. Maryland is open for business and eager to realize the life-saving and economic benefits of CAV technology, while ensuring safety for all. We are embracing CAV technology and innovation through continuing collaboration with partners interested in researching, testing, and implementing CAV in Maryland."

The *Strategic Framework* provided an overview of CAV technologies in Maryland, including completed, current, and planned pilot projects, as well as a summary of the progress detailed in the CAV Working Group's annual reports. Most recently, in January 2021, the SHA released the *Connected & Automated Vehicle Implementation Plan* with the intention of supporting the *Strategic Framework* on SHA facilities. Further expanding on the 35 strategic action items included in the 2017 *Strategic Plan* with additional resources and information, this document outlines how the SHA will continue to support the integration and adoption of CAV technologies in Maryland through seven strategic categories:

- Partnerships and Collaboration
- Workforce
- Policies, Laws, and Contractual Mechanisms
- Foundational Planning
- Engineering Design
- Early Testing and Deployment
- Software, Cybersecurity, and Artificial Intelligence

The objectives of the CAV Working Group's family of plans are Safety, Equity, Economic Vitality, Efficiency, and Agency Readiness.

Legislation

Maryland has not enacted any CAV-related legislation.

MASSACHUSETTS

In 2016, Governor Charlie Baker signed Executive Order (EO) 572, which established an Autonomous Vehicle Working Group and designated Massachusetts Department of Transportation (MassDOT) as the lead agency in authorizing testing of ADAS-equipped vehicles on public roadways. The AV Working Group, with agency members at MassDOT and the City of Boston, created an approval and licensing process for AV testing in the state as their first action. This led to two Massachusetts-based companies, nuTonomy/Motional and Optimus Ride, being permitted to conduct ADAS tests since December 2016 and May 2017, respectively. Each company submitted a testing plan to the AV Working Group, and submits a quarterly report detailing AV testing progress, issues, and findings. The Working Group has concluded that the testing approval process developed through EO 572 has accomplished the goal of facilitating safe testing activities on public roadways with a driver in the vehicle and support of participating jurisdictions and recommends that MassDOT continue leading the oversight of testing in Massachusetts.

Simultaneously, in 2018, MassDOT partnered with the University of Massachusetts—Lowell on the creation of a *Strategic Planning for Connected and Automated Vehicles in Massachusetts* report with the intention of informing a planning framework for CAV technologies. Strategic recommendations include:

- Promote CAV Testing
- Modify Driver Training and Licensing Requirements for CAV Testing
- Encourage the Use of Shared AVs (SAVs)
- Invest in Transportation Infrastructure that would Support Future CAV Needs
- Implement Signal Priority Strategies for CAVs and SAVs
- Provide Dedicated Lanes for CAV Testing
- Invest in Data Analytics and Cybersecurity
- Prepare the Workforce

Following EO-572, Governor Baker released EO-579, which established the Commission of the Future of Transportation in the Commonwealth to create a report studying how climate resiliency, electrification, CAVs, transit mobility, and land use will affect transportation between 2020 and 2040. This two-volume report summarizes recommendations and details facts, trends, and issues in these interrelated realms. Focusing heavily on scenario planning that centered on technology adoption and the distribution of jobs and housing, four scenarios were developed—Gridlock, Vibrant Core, Multiple Hubs, and Statewide Spread. Based on these scenarios, the Commission created the following recommendations, with additional strategies for each:

- Modernize existing state and municipal transit and transportation assets to more effectively and sustainability move more people throughout a growing Commonwealth.
- Create a 21st century "mobility infrastructure" that will prepare the Commonwealth and its municipalities to capitalize on emerging changes in transportation technology and behavior.
- Substantially reduce greenhouse gas emissions from the transportation sector to meet the Commonwealth's Global Warming Solutions Act commitments while also accelerating efforts to make transportation infrastructure resilient to the changing climate.
- Coordinate and modernize land use, economic development, housing, and transportation policies and investment to support resilient and dynamic regions and communities throughout the Commonwealth.
- Make changes to current transportation governance and financial structure to better position Massachusetts for the transportation system that it needs in the next years and decades.

Legislation

Massachusetts has not enacted any CAV-related legislation.

MICHIGAN

Michigan has been a leader in vehicle technologies since the dawn of the automotive age, as the state is home to numerous original equipment manufacturers and their suppliers as well as their research, development, and testing centers. Although their strategic planning efforts began in the early 2000s, Michigan Department of Transportation (MDOT) released their most recent document in 2017, the *Connected and Automated Vehicle Program Strategic Plan*. Containing a vision, mission, and goals, the plan notably contains strategies for each of its goals, categorized as:

- Foundational Actions to Institutionalize CAV
- CAV Infrastructure Deployment
- Application Development and Benefit Acceleration
- Michigan Industry and Workforce Development
- Partnering and Promotion

Additionally, the plan details the current projects and planned actions of MDOT, spanning multiple CAV and AV infrastructure roadway pursuits; testing locations; collision avoidance and weather-responsive traveler information systems; their Data Use, Analysis, and Processing Program; and educational partnerships with various research and academic partners. Other programmatic support activities include a *V2I Deployment Plan for Southeast Michigan*, SPaT Broadcast Standardization, MAP Broadcast Standardization, and the buildout of their Connected Vehicle Network Architecture Security Best Practices. To further these pursuits, MDOT released a follow up *Strategic Plan for Intelligent Transportation Systems* in 2018, which reaffirms the overall *MDOT Strategic Plan*, its *TSMO Implementation and Strategic Plan*, and the aforementioned *CAV Strategic Plan*. The key components of this plan outline supportive strategies and actions for the deployment of ITS infrastructure throughout Michigan. In 2019, the Michigan Council on Future Mobility (MCFM) was created to support various state agencies by providing recommendations for changes on state policy to 'ensure the state continues

to be a world leader in autonomous, driverless, and connected vehicle technology.' Their annual report summarizes the area of interest that this public–private partnership was advancing, including:

- High-Definition/Hyper-Accurate Map of Michigan Roadways
- Michigan Journal of Law and Mobility
- Legal Code Review
- Michigan Mobility Challenge
- Mobility on Demand
- Electric Vehicle Charging Infrastructure Development
- Automobile Insurance
- Transportation Infrastructure Funding

In February 2020, the MCFM was amended to become the Michigan Council on Future Mobility and Electrification. As of July 2020, Governor Gretchen Witmer formalized the Council into the Office of Future Mobility and Electrification, housed in the state Department of Labor and Economic Opportunity to further the mission of ensuring Michigan's emerging technologies prowess. Of particular note is the Michigan Mobility Challenge, cosponsored by the MCFM and its partners. The challenge was funded with $8 million and provides grants to innovators who are working to enhance mobility for some of the state's most vulnerable travelers. Of the 40 proposals received from across state agencies, ultimately 13 projects were awarded grants ranging between $100,000 to $2.1 million. All projects are currently under development, including:

- Autonomous Wheelchair Securement
- Driverless Delivery
- Indoor Wayfinding
- Wheels to Work Program
- Vets to Wellness Program

Legislation

The chronology of state legislation in Michigan regarding CAV technologies is as follows:

- SB 169 (2013) – Defines various AV terminology, permits testing of AVs by certain parties, and directs MDOT to submit a report by 2016 recommending any additional legislative action that might be necessary for the continued safe testing of CAV technologies.
- SB 663 (2013) – Related to SB 169, this senate bill clarifies liabilities for automated motor vehicles manufacturing.
- SB 995, 996, 997, 998 (2016) – Which:
    - Allows for automated vehicles operations under certain conditions.
    - Establishes the Michigan Council on Future Mobility with the transportation department.
    - Specifies that minimum following distance does not apply to vehicles in platoon.
    - Defines automated driving systems.

  - Allows for the creation of mobility research centers for the testing of automated technologies.
  - Exempts mechanics and repair shops from liability for fixing automated vehicles.
- HB 5335 (2018) – Creates the Michigan State Infrastructure Council within the Department of Treasury and does not preclude state expenditure for transportation purposes on connected vehicle communication technologies.

MINNESOTA

In 2018, Minnesota Governor Mark Dayton signed Executive Order 18-04, establishing the Governor's Advisory Council on Connected and Automated Vehicles. This council was tasked with providing recommendations for changes in statues, rules, and policies for CAVs, such as infrastructure, vehicle registration, training, licensure, and cybersecurity. Following this report, the Minnesota Department of Transportation (MnDOT) established a CAV Office (CAV-X) which published a *CAV Strategic Plan* in 2019. This document will be updated every 3 years to guide strategic investment and decision making. The 65 strategy recommendations are aligned with each of MnDOT's CAV-specific goals:

- Safety
- Efficiency
- Equity and Accessibility
- Economic Benefits
- Trust and Understanding
- Readiness
- Sustainability

The strategy actions are grouped into nine focus areas based on the MnDOT organizational structure:

- **Capital Investments** – What projects and capital investments should MnDOT be making or stop investing in?
- **Research and Development** – What should MnDOT research to help advance CAV statewide and nationally?
- **Partnerships** – How can MnDOT partner with public and private entities to develop a statewide vision for CAVs?
- **Regulation and Policy** – What law and policy changes are needed to safely prepare for CAV in Minnesota?
- **Operations and Maintenance** – How do CAVs impact operations? How do we plan for these changes?
- **Strategic Staffing** – How does MnDOT's workforce need to change to support CAV technological advancements?
- **Multimodal** – How does MnDOT engage our modal partners and people who walk and bike to prepare for CAVs?
- **Communications** – How do we educate the public, legislators, and state and local agencies about CAVs?
- **Long Range Planning** – How does MnDOT's 20-year plan account for CAVs?

As part of the CAV Strategic Plan development process, MnDOT conducted scenario planning workshops to better understand future implications of four specific **CAV development scenarios**:

- **Advancing Technology** – Today's technology gets incrementally better and becomes more common.
- **Connected Infrastructure** – Connected vehicle technology advances more rapidly than automation.
- **Private Automation** – Automated vehicles are common, but not all benefits are realized.
- **Integrated Mobility** – Connected and automated transportation is widely available and serves everyone.

Recognizing gaps in research regarding automated vehicle operations in cold weather climates, MnDOT has specifically partnered with private industry to better understand how technologies may need to adapt to be successful in extreme cold or whiteout conditions.

Additionally, Minnesota has established a Minnesota CAV Challenge program, which seeks proposals for emerging technologies on a rolling procurement process. To date, MnDOT has met with 52 vendors, reviewed 28 proposals, and awarded 8 projects, using a $2.5M annual allocation from state leaders. Ongoing projects include:

- Rochester Automated Shuttle Service Pilot
- Automated Bus Consortium
- Autonomous Truck Mounted Attenuator
- Fiber Optic Feasibility Study
- Statewide CAV Strategic Communications and Engagement Plan
- Smart Snelling to make snow plowing easier, more efficient, and safer using CV technologies to notify vehicles when road users are nearby.

Legislation

The Minnesota Governor's Executive Order 18-04 specified the creation of an Advisory Council on Connected and Automated Vehicles to prepare a report and include provisions that the Council must consider for "*Accessibility and equity for all Minnesotans, with a particular focus on rural communities, elderly Minnesotans, Minnesotans with disabilities, low-income communities, communities of color, and American Indians.*" This first Governor's Executive Order was later supplemented by Executive Order 19-18, which provides for the continuation of the Council and specifies representation and participation on the Council.

In 2019, Minnesota also enacted HB 6, which defines platooning systems and exempts vehicles in a platoon from the law regarding following vehicles too closely, as long as the operator of the platoon has received approval on their plan by the Commissioner.

UTAH

While the Utah Department of Transportation (UDOT) has not produced a formal CAV strategy or business plan, the UDOT Transportation and Technology Group has pioneered several pilots, including:

- **Automated Shuttle Pilot** – Utah's first fully automated vehicle pilot served 3 purposes:
  - To evaluate the effectiveness of the AV technology in serving first-mile/last-mile needs
  - To understand the operation and reliability of AV
  - To expose the public to the technology
- **Utah Smart Transit Signal Priority** – This program provided transit system priority to maintain transit schedules in congested traffic conditions, as well as a modified functionality to provide preemption for snowplows while actively plowing in storm conditions.
- **Connected Vehicle Data Ecosystem** – A cloud-based data analytics and storage platform created in partnership with Panasonic, which includes these related projects:
  - Connected Vehicle Spot Weather Impact Warnings – RSUs send weather (snow, ice, fog) warnings to vehicles. On-board vehicle sensors communicate back real-time weather conditions.
  - Connected Vehicle Curve Speed Warning Systems – Installation of V2I communication at high crash frequency curves to alert drivers of an upcoming curve and its recommended speed.

UDOT recently rolled out a new public-facing website summarizing the activities of the Transportation Technology Group and lessons learned from the pilot programs to date.

Legislation

- HB 373 (2015) – Authorized UDOT to conduct a CAV testing program.
- HB 280 (2016) – Required a study of AV technologies, including evaluation of NHTSA and AAWVA standards and best practices, appropriate safety features, and regulatory strategies and recommendations.
- SB 56 (2018) – Amended HB 373 to define a "connected platooning system" to mean a system that uses vehicle-to-vehicle communication to electronically coordinate the speed and braking of a lead vehicle with the speed and braking of one or more following vehicles. Also included an exemption to minimum following distance requirements for a vehicle that is part of a connected platooning system.
- SB 72 (2019) – Defined CV and allowed for UDOT to obtain, collect, and utilize anonymized location data of certain CVs.
- HB 101 (2019) – Developed through cooperation of the Transportation Technology Group and Utah state legislature, this most recent legislative actions amended state traffic laws, licensing, and title requirements and added special provisions for the operation of automated vehicles. Specifically, the bill includes the following provisions:
  - Defines terminology related to AVs.
  - Allows for the operation of a vehicle in the state by an automated driving system.
  - Exempts a vehicle with an engaged automated driving system from licensure requirements.
  - Provides protocols in the case of a crash involving an automated vehicle.

- Requires a vehicle equipped with an automated driving system to be properly titled, registered, and insured.
- Preempts political subdivisions from regulating automated vehicles in addition to the regulation provided in state statue.

TAC MEETING #1 ADDITIONAL INFORMATION

CANADA

Transport Canada, the national administration for transportation of the Government of Canada, maintains a dedicated website for CAVs under the umbrella of road transportation and innovative technologies. In addition to clearly delineating the federal, provincial/territorial, and municipal responsibilities of CAV management and oversight, Transport Canada has produced a number of safety-focuses resources for CAV planning, policy-making, assessment, and testing. These resources include:

- *Canada's Vehicle Cyber Security Guidance (2020)*
- *National Policy Framework for Connected and Automated Vehicles (2019)*
- *Canada's Safety Framework for Connected and Automated Vehicles (2019)*
- *Safety Assessment for Automated Driving Systems in Canada (2019)*
- *Testing Highly Automated Vehicles in Canada: Guidelines for Trial Organizations (2018)*
- *Canadian Jurisdictional Guidelines for the Safe Testing and Deployment of Highly Automated Vehicles (2018)*

Additionally, the Transportation Association of Canada, a non-profit, national technical association, maintains a clearinghouse of on-going Canadian CAV research, planning, and legislation, in addition to a wide variety of CAV resources.

FHWA MACROECONOMIC IMPACTS OF AUTOMATED DRIVING SYSTEMS IN LONG-HAUL TRUCKING

Published in 2021, this Federal Highway Administration (FHWA) sponsored report utilizes a scenario planning approach to analyze the potential economic impacts of automation in freight (SAE Level 4 and 5), including employment, earnings, and gross domestic product. Three scenarios (slow, medium, and fast) of the adoption of automated driving systems (ADS) were analyzed with USAGE-Hwy, a computable general equilibrium (CGE) model of the U.S. economy that includes detail on transportation related industries including for-hire and in-house trucking. Key findings include:

- Produce welfare increases ranging between $35 per U.S. person per year under the slow adoption scenario to $69 under the fast adoption scenario.
- Raise annual earnings for all U.S. workers between $203 per worker per year under the slow scenario and $267 under the fast scenario.
- Increase GDP by at least 0.3% 30 years post market adoption.
- Increase total U.S. employment between 26,400 to 35,100 per year on average, despite decreases in employment for long-haul truck drivers.

- Assuming that occupational turnover rates remain as they are, these positive economic impacts would not be accompanied by forced-lay-offs under the slow and medium adoption scenarios. Only under the fast adoption scenario are there short-lived, small magnitude lay-offs.
    - Those lay-offs occur only during a period of 5 years and the maximum lay-offs in a single year is 11,000, just 1.7% of the long-haul driver workforce.

NEXT STEPS

In the next steps for this project, the research team will engage with the Alaska CAV working group and project technical advisors to identify gaps and needs in preparing for CAV technologies and any barriers to implementation (Tech Memo #2). From there, we will develop a draft and final *CAV Strategic Plan* to guide the CAV working group and DOT&PF actions.

FOR MORE INFORMATION

The following appendices provide additional information:

- References
- Appendix A: Additional Definitions and Key Terms
- Appendix B: Example Agency CAV Vision and Goals
- Appendix C: Example State Executive Orders or Legislation

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APPENDIX A

ADDITIONAL DEFINITIONS & KEY TERMS

Dedicated Short Range Communications (DSRC)

One-way or two-way short-range wireless communication channels in the 5.9 GHz band specifically designed for automotive use, with a corresponding set of protocols and standards dictated by the Federal Communications Commission. There have been multiple applications of DSRC, but in November 2020, the FCC reallocated this spectrum to Cellular V2X communication, which uses 4G LTE or 5G mobile cellular connectivity to send and receive signals from mobility vehicles.

Roadside Unit (RSU)

A roadside unit is a DSRC transceiver that is mounted along a roadway. Intelligent roadside units combine sensors and V2I communication equipment to monitor and communicate with roadway traffic.

Signal Phase & Timing (SPaT)

Data format to communicate signal operations with CAVs.

Map Data (MAP)

Data format to communicate intersection geometry with CAVs.

Internet of Things (IoT)

The interconnection, via the internet, of computing devices (sensors, software, etc.) embedded in everyday physical objects ('things'), which enables the exchange of data with other devices and systems. Common applications include products pertaining to the concept of 'smart homes', such as security systems, thermostats, and audio systems. As real-time analytics, machine learning, commodity sensors, and embedded systems have progressed, public applications include Wi-Fi kiosks, street lighting, and traffic signal systems.

Public Private Partnership (PPP or P3)

As an increasingly popular arrangement for the piloting of technologies for real-world application and learning, a public–private partnership combines the resources of government and business to provide for their communities. P3s are a crucial tool for the development of CAV technologies.

APPENDIX B

EXAMPLE AGENCY CAV VISION AND GOALS

1. Introduction and Background

The Connected and Automated Vehicles (CAV) Program at the Florida Department of Transportation (FDOT) is gaining significant momentum. FDOT's Central and District Offices, planning and implementation stakeholders, industry entities, and university partners are aggressively pursuing the deployment of the CAV Program to achieve sustainable safety, mobility, and economic development (SME) benefits. FDOT has started planning, designing, and deploying several CAV pilot projects, and is engaging with private companies that are developing, testing, and implementing CAV technologies. FDOT's Transportation Systems Management and Operations (TSM&O) Program and the Statewide Arterial Management Program (STAMP) are key to the Department's CAV Program.

FDOT and its partners are committed to continuing the deployment of the CAV projects to support the SME needs in the state. FDOT's CAV Program partners include the United States Department of Transportation (USDOT), local agencies (city and county), Metropolitan Planning Organizations (MPOs), Transportation Planning Organizations (TPOs), toll authorities, local transit agencies, private-sector technology and application developers, auto manufacturers (original equipment manufacturers (OEMs) and Tier 1 and Tier 2 suppliers), Florida and national modal, professional, and standards development organizations, and universities. This CAV Business Plan links the CAV Program with the various project activities and the CAV efforts to create a comprehensive statewide approach which includes planning, research, implementation, maintenance, and operations. This CAV Business Plan follows other FDOT programs and plans, including the *Florida Transportation Plan (FTP), TSM&O Strategic Plan, STAMP Action Plan, Transportation Technology Strategic Plan, Strategic Highway Safety Plan (SHSP), Strategic Intermodal System (SIS) Policy Plan, Florida's Aging Road Users Strategic Safety Plan (Safe Mobility for Life Coalition),* and *Traffic Incident Management (TIM) Plan.*

At the national level, FDOT is actively involved in committees and initiatives, including the multi-state Connected Vehicle (CV) Pooled Fund Study, the American Association of State Highway and Transportation Officials' (AASHTO) Committee on Transportation System Operations (CTSO), the AASHTO Committee on Traffic Engineering (CTE), the AASHTO Vehicle-to-Infrastructure (V2I) Deployment Coalition, the I-95 Corridor Coalition, the Institute of Transportation Engineers (ITE), and the Intelligent Transportation Society of America (ITSA). For example, FDOT responded to the AASHTO Signal Phase and Timing (SPaT) challenge with a project in Tallahassee. Such activities have allowed FDOT to sustain and expand its national leadership while developing a strong CAV Program.

The CAV Business Plan was initiated within FDOT's Statewide Traffic Engineering and Operations Office (STEOO). As the CAV Program is expanding, the coordination and collaboration efforts with FDOT Central and District Offices are also increasing. To better understand the perspectives of various offices on CAV opportunities and challenges, and their planned roles, the STEOO interacts and collaborates with internal partners and external stakeholders. This Plan supports safety, mobility, and infrastructure advancements achievable by deploying CAV technologies.

1.1. Vision, Goals, and Objectives

The CAV Program goals and objectives support the *FDOT TSM&O 2017 Strategic Plan*. The CAV technologies have the potential to significantly reduce highway crashes that result in traffic fatalities. This is consistent with FDOT's vision and that of *Vision Zero*. The CAV technologies also have the potential to improve travel time, increase vehicle and person mobility, enhance multimodal operations, and positively affect the economy in Florida.

1.1.1. CAV Vision

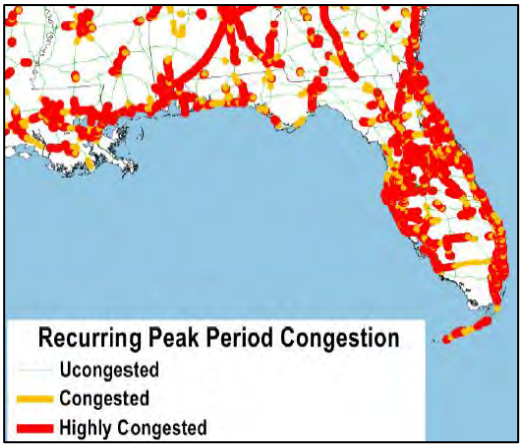
This CAV Business Plan drives, towards *Vision Zero* with a fatality-free roadway network and a congestion-free transportation system in Florida using CAV technologies.

1.1.2. Safety Objectives

The objective of the CAV Program is to improve safety for all transportation modes and road users, including pedestrians and bicyclists. This safety objective aligns with the FDOT's SHSP, FTP, SIS Policy Plan, and other state and national programs funded by the Federal Highway Administration (FHWA), the Federal Motor Carrier Safety Administration (FMCSA), and the National Highway Traffic Safety Administration (NHTSA). NHTSA observed that 94% of highway crashes are caused by human error[1]. Recognizing the potential to mitigate human error, while noting that this expectation needs to be tested and validated, implementation of CAV technology is anticipated to improve safety in the long-term.

1.1.3. Operations/Mobility Objectives

Traffic congestion (Figure 1) in Florida is increasing due to several factors, including population and tourism growth. According to the USDOT, CAV signal-control applications reduced travel time by 27%, while the cooperative adaptive cruise control and speed harmonization reduced travel time by 42%. While continuing to implement conventional operational improvements, the objective of the CAV Program is to leverage CAV technologies to significantly improve traffic operations, and increase vehicle, person, and multimodal throughput.



Source: FHWA

Figure 1. Peak Period Congestion 2045

1.1.4. Economic Development Objectives

The objective of the CAV Program is to interact with the private sector to promote economic development in Florida. As of September 2018, FDOT has already entered into statewide data user agreements with Waze, Traffic Technology Services (TTS), Connected Signals (CS), Live Traffic Data (LTD), and is exploring other industry partners, such as freight, transit, etc. Collaboration with transportation industry partners is essential for accomplishing this objective.

1.2. Focus Areas

The following are the seven priority focus areas of this Business Plan:

1. Policies and Governance
2. Program Funding
3. Education and Outreach
4. Industry Outreach and Partnerships
5. Technical Standards and Specifications Development
6. Implementation Readiness
7. Deployment and Implementation

1.3. CAV Implementation Roadmap Overview

Of the three phases (Figure 2) to implement this Plan, the *Initialization Phase* has been in progress since FY 2017 with various research and pilot projects, along with involvement in national committees and

[1] https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812506

organizations that focus on CAV standards and implementation efforts. Table 1 shows the relationship between the roadmap and the specific priority focus areas.

Figure 2. CAV Implementation Roadmap Overview

Table 1. CAV Focus Areas Roadmap

CAV Focus Area	Initialization	Early Implementation	Full Scale Implementation and Operations
Policies and Governance	⦿	➡	➡
Program Funding	⦿	➡	➡
Education and Outreach	⦿	O	➡
Industry Outreach and Partnerships	⦿	O	➡
Technical Standards and Specification Development	⦿	O	➡
Implementation Readiness	⦿	O	➡
Deployment and Implementation	⦿	O	O

NOTE: Please refer to the Legend Key, preceding Page 1.

The **2017-2018 Initialization Phase** focus elements include a wide range of activities, including:

- Participate in national organizations such as AASHTO and ITE.
- Develop and build relationships with CAV technology manufacturers and application developers.
- Provide opportunities for both internal and external developers to develop and test technologies and applications.
- Build industry partnerships and update the relevant FDOT policies and approaches.
- Participate in CAV initiatives and use available tools such as those from USDOT.
- Develop, implement, and evaluate CAV pilot projects.
- Develop a data management plan, an operations and maintenance (O&M) framework, education and outreach activities, and understand the existing conditions.
- Coordinate internally on CAV activities, while aligning with other plans and FDOT's vision.

The **2019-2020 Early Implementation Phase** focuses on small- to medium-scale implementation and pilot projects, using O&M funds, phasing in CAV, upgrading SunGuide® software, utilizing the Data Integration and Video Aggregation System (DIVAS), updating architecture documents, developing performance measures, and collaborating with private and public industry partners.

The **2020+ Full-Scale Implementation and Operations Phase** focuses on completing infrastructure upgrades, implementing large CAV projects, conducting performance and outcome assessments, performing O&M activities, advancing outreach with stakeholders, and analyzing the impacts of agency and industry partnerships.

Pilot Deployment Objectives

Primary goal: Develop back-end infrastructure, network components, and business processes to support broad vehicle to infrastructure applications that is broadcast-medium agnostic, scalable, and sustainable.

Secondary goal: Begin broad installation of roadside units and equipped vehicles to facilitate applications that improve safety and mobility.

Primary Application Spaces:

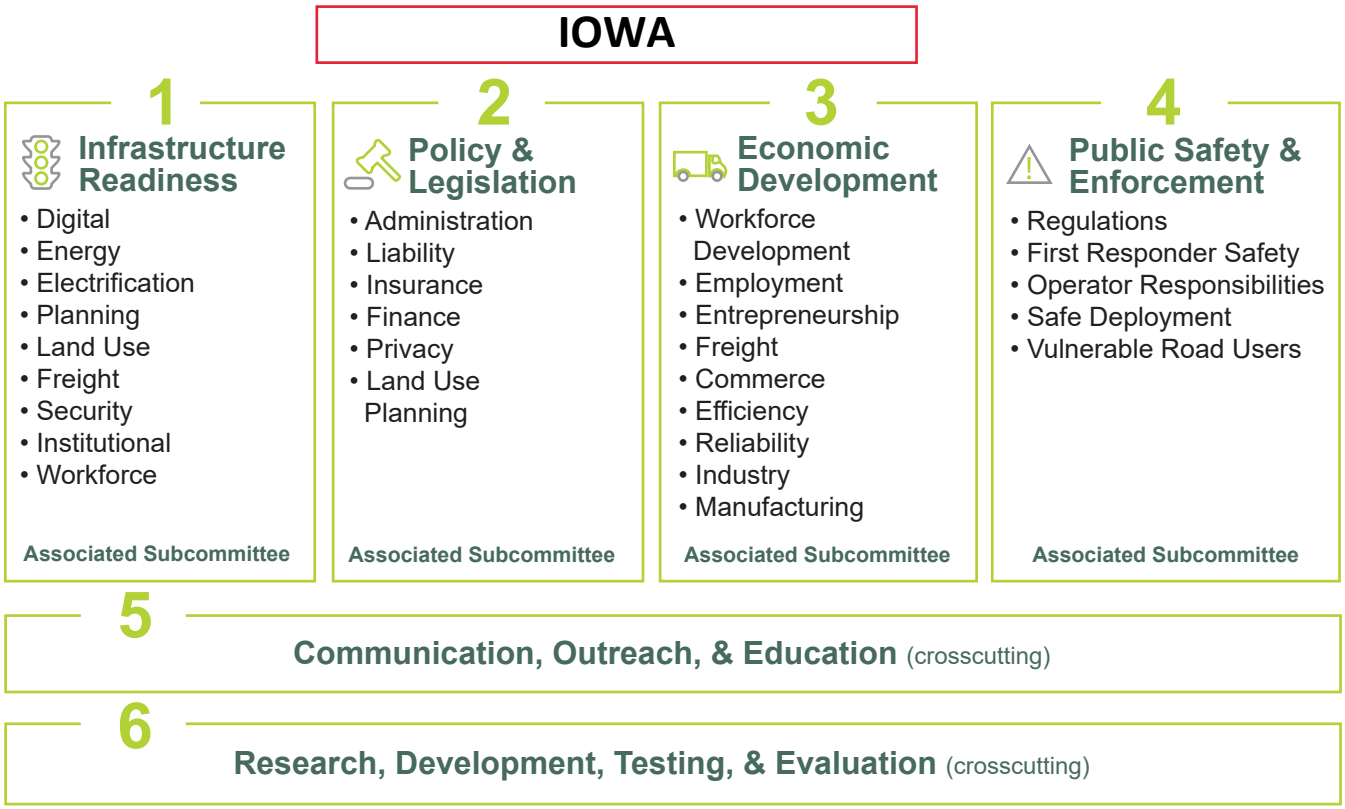


Figure 2. ATC Strategic Objective Areas

1. Infrastructure Readiness

A. Accelerate Infrastructure Readiness - The ATC will support infrastructure readiness initiatives and coordinate with efforts underway within the Iowa DOT and partner organizations.

B. Implement National Guidance - The ATC will always be up to date and work to implement the latest guidelines and best practices for infrastructure readiness in support of AT.

C. Improve Traffic Control Assets - The ATC and Iowa DOT are advancing best practice in maintaining and upgrading traffic control assets to better enable automation and machine vision.

D. Leverage Communications Infrastructure - Iowa's communications infrastructure will be ready for automated transportation applications, including capacity, coverage, and security.

E. Develop Agency Workforce - The ATC will be a recognized resource for AT-related workforce capacity building and supports efforts to close gaps with resources and education.

2. Policy & Legislation

A. Evolve Administrative Rules - The ATC will advise the Iowa DOT and others on the development of administrative rules as needed.

B. Address Liability & Insurance - The ATC will understand how AT affects insurance and liability, assess practices from other states, and coordinate with lead agencies on changes needed.

C. Advise on Legislation - The ATC will suggest legislative changes, assess pending legislation, and offer advice and consultation on AT-related legislation.

D. Policymaker Outreach - Policymakers throughout Iowa at all levels of government will be informed about AT and anticipated impacts on Iowa.

E. Community Readiness - Local governments in Iowa will know about the ATC, can reach out for guidance on planning for AT, and will be better prepared for AT.

3. Economic Development

A. Outreach to Business - The ATC and Iowa corporations will engage in ongoing dialogue and mutual efforts toward advancing AT and achieving its benefits for the Iowa economy.

B. Foster Business Growth - The ATC will be a resource for existing and potential Iowa companies seeking to grow their AT-related business.

C. Improve Freight Movement - The ATC will foster learning and awareness of automated freight movement technology, encouraging AT-enabled advances in freight and logistics.

D. Workforce Development - The ATC will engage with and promote workforce development for Iowa businesses in AT-related areas of need, in collaboration with educational institutions.

4. Public Safety & Enforcement

A. Adapt to Changing Laws - The ATC is the focal point for deliberation on adjustments needed by stakeholders to accommodate changing laws or rules related to AT and safety for all users.

B. Explore Vehicle Automation Indications - The ATC will lead exploration into guidance for external vehicle indicators on ADS-equipped or platoon-capable vehicles.

C. Promote Crash Data & Investigation - The ATC will know what data are available from AVs and will recommend what additional data should be captured from crashes.

D. Ensure Safe Incident Management - As AT proliferates, the ATC will promote advances in incident and crash safety technologies and applications, as well as first responder safety.

5. Communication, Outreach, & Education

- As a crosscutting objective area, this will be woven throughout all activity. The ATC will strive to be well-educated on AT and work to be known to all stakeholders as a resource for information and a conduit for suggestions.

6. Research, Development, Testing, & Evaluation (RDT&E)

- As needed, the ATC and its stakeholders will learn from and advance AT in Iowa by directing and coordinating AT efforts related to RDT&E.

1.2 Next Steps

The visioning work of the ATC in 2019 followed a three-prong framework. First is strategic, revisiting the foundational vision, mission, purpose, and goals for the Council. The six objective areas are the culmination of that step. Second is the programmatic prong, which fleshes out the objectives and leads to specifically defined desired outcomes. And third is the tactical prong, which generated a set of specific tactics that are tied back to outcomes, objectives, and ultimately the strategy.

The tactical prong is where this vision document leaves off. Individuals among all subcommittees weighed in on the priorities they want to pursue, which are presented at the end of this document. In 2020, each of the six objective areas are proceeding with work plans to continue guiding next steps. These work plans will document the tactical priorities, roles and responsibilities, resourcing, planning, and timelines.

1.3. Communications

The ATC maintains a public website - https://IowaDrivingAV.org/ - as a centralized hub where people can go for more information. Please refer to the Contact Us page with any questions, requests, or suggestions related to automated transportation in Iowa.

1. INTRODUCTION

Purpose

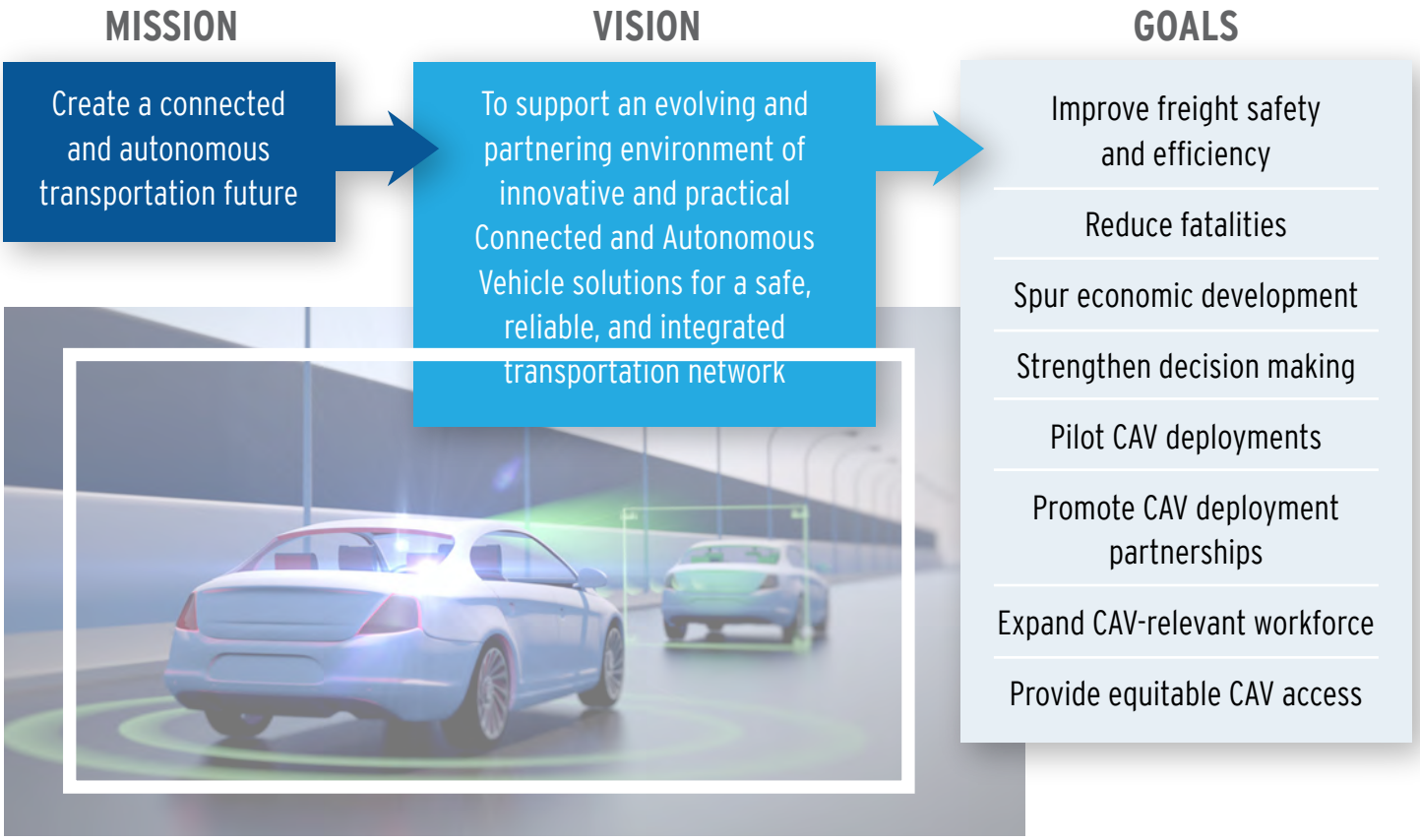
The evolution and deployment of connected and autonomous vehicles (CAV) and the infrastructure to support these vehicles will transform the safety, economic and personal mobility opportunities that Kansas residents, businesses and visitors experience. The ability to leverage these opportunities requires a statewide CAV vision and framework in place for agencies and stakeholders to maximize CAV deployments and realize benefits for Kansas travelers.

In 2018, the Kansas Department of Transportation (KDOT) created the Statewide Connected and Autonomous Vehicle Task Force (Task Force) to increase awareness and educate state agencies on the potential benefits of deploying CAV systems in Kansas. The following year, KDOT and the Task Force developed a CAV Vision and framework for the State of Kansas documented in this Kansas Connected and Autonomous Vehicle Vision Plan. This Vision Plan includes individual blueprints for Kansas state agencies involved in CAV policy, deployment, and operational considerations (see Appendix). Each blueprint provides a high-level plan for how state agencies can incorporate connected and autonomous vehicles into their organizational business planning, staffing and activities.

Vision, Mission and Goals

KDOT and the Task Force collaborated in developing a statewide CAV vision, mission and supporting goals that combine to provide a foundation for advancing emerging technologies in the state. This work was done through surveys, interviews and four interactive work sessions with the Task Force, all of which is documented in the Appendix. The state's integrated, comprehensive approach is visualized below in Figure 1.

Figure 1. Kansas Connected and Autonomous Vehicle Vision, Mission and Goals



The supporting goals developed by the Task Force involve the following:

Table 1. Kansas CAV Supporting Goals

Improve Freight Safety and Efficiency	• Support a freight specific CAV operational environment, resources, and policy so that goods movement in the state is safe and efficient.
Reduce Fatalities	• Provide a CAV environment that further enhances traveler information for weather conditions and incidents on Kansas roadways for all travelers. • To provide a CAV environment that promotes safety for travelers and first responders on Kansas roadways.
Spur Economic Growth	• Support economic growth in the state by improving freight conditions, enhancing workforce transportation, and improving overall system reliability.
Strengthen Decision Making	• Advance existing and emerging technologies for data collection, management, and analysis that support a strong CAV environment in a secure and proactive manner.
Pilot CAV Deployments	• Develop and participate in Kansas CAV pilot (and regional partners') projects by 2020 so that benefits and lessons learned can be captured to advance a CAV future.
Promote CAV Deployment Partnerships	• Promote private sector partnerships in Kansas CAV pilot projects by 2020 so that the CAV industry advances in Kansas. • To promote partnering opportunities to expand academic and business ventures that advance emerging technology solutions for a CAV future.
Expand CAV relevant Workforce	• Train and provide workforce advancement that aligns with future CAV applications and needs in Kansas.
Provide Equitable CAV Access	• Ensure the benefits of CAV technologies and operations are available to all Kansans • Develop educational and outreach materials for state agencies that adopt CAV solutions. • Inform Kansas residents about the CAV future for the state through public information pieces (newspaper articles) and other available information means (websites and tweets).

Together, these goals and progress towards them will position the State of Kansas to achieve its vision to support an evolving and partnering environment of innovative and practical Connected and Autonomous Vehicle solutions for a safe, reliable and integrated transportation network.

INTRODUCTION

A Vision for CAV in Maryland

Maryland developed the vision for connected and automated vehicles (CAV) by collaborating with many stakeholders who participate in the Maryland CAV Working Group, described in the next section. Maryland's vision for CAV is to uphold and enhance a Safe, Efficient, and Equitable transportation future by delivering collaborative and leading-edge CAV solutions. Maryland is open for business and eager to realize the life-saving and economic benefits of CAV technology, while ensuring safety for all. We are embracing CAV technology and innovation through continuing collaboration with partners interested in researching, testing, and implementing CAV in Maryland.

MARYLAND FRAMEWORK

In the September 2020 survey distributed to stakeholders across Maryland, we heard loud and clear that CAV technology is an important area of emphasis for the State. Most respondents were "Very Enthusiastic" or "Enthusiastic" about deploying CAV technology in Maryland. Only 16 percent of respondents were "Worried" or "Very Worried," with the remainder taking either a "Neutral" or "Didn't Know Enough" stance to form a solid opinion.

That level of interest is an important component in developing this Framework as it sets the stage on where to go next. As we convert that enthusiasm into this Framework, feedback from stakeholders has coalesced around **five focus areas** where Maryland should draw attention and resources.

These five areas of focus guide everyone—with the encouragement to "find your place" among the recommendations and advance your very own state of the practice for CAV within your company, your agency, your institution, or your organization. These following focus areas reflect the current environment, and will evolve as additional progress, continued input, and ongoing developments shape CAV technology along a timeline influenced by many internal and external factors:

The five areas of focus in this Framework are:

1. **Public Education and Outreach**
2. **Planning and Policy**
3. **Early Deployment and Testing**
4. **Infrastructure**
5. **Workforce**

For each of the key areas, this Framework provides a brief overview of activities to date, followed by a call to action with a set of high level objectives that empowers stakeholders to work together to advance CAV strategies that align with the objectives.

Core Values

Before addressing the key areas, it is important to first address some core values for Maryland that came across very strongly through our outreach and are generally viewed as cross-cutting.

Advancing Innovation with a Safety Driven Lens

Introducing CAV technology will provide an array of benefits and bring about many new challenges, but at its core, **safety remains the number one priority.** It is essential to ensure that CAV technology is developed, tested, and ultimately used safely to realize the many anticipated benefits. Maryland supports its commitment to Vision Zero by taking proactive steps to increase roadway safety through various programs, including the Strategic Highway Safety Plan, the Highway Safety Improvement Plan, and various driver education programs among many other outreach efforts. Maryland has and will continue to pursue safety throughout its CAV technology integration activities via transparent engagement with stakeholders. That dialogue and collaboration is a foundation of Maryland's efforts to safely deploy CAV technology.

Access to Transportation Technology for All

The benefits that existing travelers and commuters can realize in safety and mobility should be **equitably available to all users** who have varying abilities and resources, including people with disabilities; users of varying ages, socioeconomic status, and demographics; and travelers across different modes, including vulnerable pedestrians, bicyclists, and new mobility users (e.g., e-scooters).

CAV technology presents a great opportunity to support all geographic areas of the State. As Maryland progresses with integrating CAV technology, stakeholders should consider the varying needs of the different regions in Maryland, as well as the differing opportunities and challenges of rural, suburban, and urban land uses.

The following pages provide extended detail on the five key areas. A summary of Future Directions for each area is shown below.

PUBLIC EDUCATION AND OUTREACH

- Increase transparency of educational CAV material and ongoing efforts.
- Ensure diverse audience when communicating initiatives.
- Leverage existing outreach avenues.

PLANNING AND POLICY

- Facilitate opportunities through the Maryland CAV Working Group.
- Establish clear goals and metrics for CAV in Maryland.
- Identify and address barriers to CAV.
- Incorporate CAV into planning and policy documents.
- Establish policies on cross-collaboration and open data sharing.
- Anonymize CAV data and safeguard from mishandling.

EARLY DEPLOYMENT AND TESTING

- Broaden use cases for early deployment and pilot projects.
- Gather public perception and adjust pilots.
- Grow the list of locations for CAV testing.
- Prioritize freight-focused CAV strategies in the short term.
- Leverage deep bench of academic excellence.
- Embrace new partnerships for non-traditional research.

INFRASTRUCTURE

- Establish baseline operation of technology infrastructure.
- Establish acceptable equipment downtimes.
- Remain engaged with national guidelines and integrate or create State-specific specifications.
- Dedicate resources and create partnerships to build out the communications infrastructure.
- Asset-management and software configuration management.

WORKFORCE

- Promote and enhance existing workforce.
- Address recruitment & retention gaps at the local level.
- Establish expectations for future staffing.
- Field training and traditional trade jobs should be encouraged.

2 Impacts of CAV Technologies in Massachusetts

This chapter describes the potential impacts that CAVs are likely to have on transportation in Massachusetts. Included are:

1. **Impacts on the mission of MassDOT**: CAVs will have significant impacts on safety, mobility, congestion, environment, and energy consumption, and ultimately land use patterns could change, making other impacts more variable.

2. **Impacts on policy and planning**: Included are institutional impacts on the organization of MassDOT and the distribution of funding, as priorities for projects may change with the advent of CAVs.

3. **Economic impacts**: The introduction of CAVs will require new infrastructure investments to maximize the benefits of these technologies, and many of these projects will require extensive resources and funding. However, the introduction of these technologies may also result in savings.

4. **Impacts on data availability**: CAVs will generate and utilize massive amounts of data. State DOTs will have to collect, process, and disseminate information from and to CAVs. This will have a number of implications with respect to data organization, processing, and security.

2.1 Impacts to MassDOT's Mission

The core mission of any state DOT is to provide a safe transportation system that ensures the mobility of goods and people and enhances quality of life. CAV technologies have the potential to substantially affect safety, congestion, energy consumption, and local land use decisions. CAV operations are inherently different from those of human-driven vehicles: they can be programmed to comply with traffic laws; they do not drink and drive; their reaction times are quicker; they can be optimized to smooth traffic flows, improve fuel economy, and reduce emissions; and they can deliver freight and transport disabled and unlicensed travelers to their destinations [*25, 26*].

2.1.1 Safety

While the frequency of crashes is generally in decline in the United States, such incidents remain a major public health concern. The total number of roadway crashes on a per-VMT basis fell at an annual rate of 2.3% from 1990 to 2011, while roadway injuries fell at an annual rate of 3.1% [*24*]. The number of fatalities shows a similar trend: a 25% decrease from 2005 to 2014. However, a marked increase of 7.2% from 2014 to 2015 (from 32,744 to 35,092) represents the largest increase in the last 50 years [*27*]. This is partly because Americans drove more and partly because they drove more poorly (e.g., distracted driving due to smartphone usage) [*28*].

4

CAV Program Goals and Strategies

This previous work has helped position MDOT's efforts to support and advance CAV technologies. Each of these documents defined a vision and a mission for MDOT to help support their efforts. Building on these previous efforts and as a way to provide some consistent guidance moving forward MDOT's CAV vision and mission statements have been updated to reflect the success of efforts to date and to recognize the rapidly changing environment of CAV technologies moving forward.

Program **Vision**

The Michigan Department of Transportation will be recognized as a progressive and innovative leader, driving national efforts to explore and implement emerging mobility technologies.

Program **Mission**

The Michigan Department of Transportation will work to ensure Michigan remains the national leader in the [illegible] deliver enhanced transportation safety and reliability, providing economic benefit and improved quality of life.

Table 1 illustrates the relationship between these vision/mission statements, and those of the department-wide and Transportation System Management & Operations (TSM&O) vision and mission statements.

Table 1: Mission and Vision Statement Alignment

	Mission Statement	Vision Statement
MDOT (Department-Wide)	Providing the highest quality integrated transportation services for economic benefit and improved quality of life.	MDOT will be recognized as a progressive and innovative agency, with an exceptional workforce that inspires public confidence.
MDOT TSM&O Program	Operate and manage an optimized, integrated transportation network by delivering high quality services for safe and reliable mobility for all users	■ Integrate Operations as a core MDOT program united with the execution of MDOT's overall mission ■ Inspire public confidence as a progressive and innovative national leader in the management and operations of our transportation system ■ Collaborate across program areas, leveraging technology and resources to achieve the best possible results ■ Maintain a sustainable and engaged operations workforce with exceptional knowledge, skills, and abilities
MDOT CAV Program	MDOT will work to ensure Michigan remains the national leader in the evolution of CAV technologies, to deliver enhanced transportation safety and reliability, providing economic benefit and improved quality of life.	MDOT's CAV Program will be recognized as a progressive and innovative leader, driving national efforts to explore and implement emerging mobility technologies.

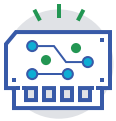
Program Goals

With this vision and this mission in mind and with the rapid pace of development of CAV technologies MDOT needs a well-informed and well-defined approach to be prepared and engaged in CAV technology. This approach will recognize that MDOT's CAV programs' mission, vision, and actions are built upon and support the overriding guiding principles and objectives of the agency as a whole.

To support MDOT's CAV vision and this mission the following program goals have been identified.

Goal 1: **Serve as a national model to catalyze CAV deployment**

The USDOT and peer agencies will look to Michigan for a roadmap for how to plan, design, build and sustain CAV deployments, including identification of innovative business models for CAV.



Goal 2: **Establish foundational systems to support wide-scale CAV deployment**

MDOT will develop foundational systems and standards, such as data management, backhaul communications, and IT/security standards to enable sustained deployment activity.

Goal 3: **Make Michigan the go-to state for CAV research and development**

Michigan will have the combination of assets, human capital and experience necessary to keep current CAV research and development activities in the state, and draw new activities here to create economic benefit for the state.

Goal 4: **Accelerate CAV benefits to users**

MDOT will identify ways to add value for our customers today and in the near future during the transitional timeframe of connected and automated vehicles on our roadways.

Goal 5: **Exploit mutual benefit opportunities between CAV technologies and other department business processes and objectives**

MDOT will explore ways to leverage CAV data, safety and operational benefits to support and enhance other business processes.

Goal 6: **Use Michigan experience to lead dialogue on national standards and best practices**

MDOT will engage in industry groups, peer agency alliances, and with the private sector to share experiences, support peer agency activities, and guide V2I standards development.

CONNECTED VEHICLES

Connected vehicles (CVs) use different technologies to communicate with other vehicles, infrastructure (e.g., traffic signals), pedestrians, bicyclists and other objects, such as trains and smartphones. Connected vehicles can provide information and alerts to drivers and other vehicles to reduce crashes, improve traffic flow and save energy. An example of CV technology is truck platooning. Platooning uses technology to electronically link vehicles. This can reduce congestion, save fuel and minimize driver stress.

Connected and automated vehicles are vehicles that combine both automated and connected technology. CAV is a broad term that encompasses both CV and AV technology.

ELECTRIC VEHICLES

Many AVs are being built as electric vehicles but the future is unclear whether the industry will broadly adopt electric vehicle (EV) technology. EVs use an electric motor as the primary propulsion system. Types of electric vehicles include: 100 percent battery electric vehicles, hybrid-electric vehicles, and plug-in hybrid electric vehicles. EVs may be charged at home, work or public charging stations. Currently, there are few stations that rapidly charge EVs. Infrastructure investment is important to support electrification and automated vehicles. Advancing electric vehicles promotes Minnesota's goals to reduce greenhouse gas emissions and meet the state's climate change reduction goals.

SHARED MOBILITY

Shared mobility is the idea that transportation services could be shared among users. Mobility-as-a-service (MaaS) allows users to arrange various modes of transportation in a single trip, such as a bike share to a public transit stop and then a rideshare to an ultimate destination. With MaaS, fewer people own personal vehicles. With transportation network companies like Uber and Lyft expanding around the world, trends show a change in travel behavior. In the future, fewer people may choose to own private vehicles due to social norms or vehicle costs; however, the future of these trends is unclear.

MnDOT's CAV Approach

MnDOT developed a three-pronged approach for its CAV program, focusing on strategic investment, innovation and knowledge-sharing. These approaches guide the MnDOT CAV Strategic Plan.

STRATEGIC INVESTMENT

Make modest strategic investments, recognizing that CAV technology is in its infancy and will change quickly

INNOVATION

Question assumptions, embrace new ideas and partners, and remain nimble to shifts in technology in a rapidly changing environment

KNOWLEDGE-SHARING

Be transparent with the public and share ideas and lessons learned with peer agencies and the industry at large

Goals

To further the agency's mission to plan, build and operate a safe, accessible, efficient and reliable multimodal system, the MnDOT CAV Strategic Plan developed goals for MnDOT's CAV program.

The action plan that follows in this document links each strategy to one or more of these goals.

SAFETY –Support deployment of CAV technology to improve safety and achieve Toward Zero Death (TZD) goals to eliminate traffic-related deaths

EFFICIENCY –Harness CAV technology to improve the efficiency of the transportation system for the movement of people, goods, and services

EQUITY AND ACCESSIBILITY –Use CAV technology to improve transportation equity and accessibility for all Minnesotans

ECONOMIC BENEFITS – Position Minnesota as a place to safely test and deploy CAV in order to advance public benefits and encourage workforce and economic development

TRUST AND UNDERSTANDING – Engage the public and other stakeholders to build trust and develop understanding of CAV

READINESS – Support MnDOT in preparing the organization to proactively address changes in transportation technology

SUSTAINABILITY –Emphasize CAV technologies that have the potential to promote environmental and fiscal sustainability

Focus Areas

The MnDOT CAV Strategic Plan is organized around nine focus areas based on MnDOT's organizational and business functions.

1. Capital Investment. What projects and capital investments should MnDOT be making or stop investing in?

2. Research and Development. What should MnDOT research and develop to address Minnesota challenges and help advance CAV statewide and nationally?

3. Partnerships. How can MnDOT partner with public and private entities to develop a statewide vision for CAV?

4. Regulation. What law and policy changes are needed to safely test CAV in Minnesota?

5. Operations and Maintenance. How does CAV impact MnDOT operations and how do we plan for these changes?

6. Strategic Staffing. How does MnDOT's workforce need to change to support CAV technological advancements?

7. Multimodal. How does MnDOT engage cyclists, pedestrians, transit, rail and other modal partners to prepare for CAV?

8. Communications. How do we engage the public, legislators, employees, and state and local agencies about CAV?

9. Long Range Planning. How should MnDOT's long range plans address CAV?

APPENDIX C

EXAMPLE STATE LEGISLATION

Please note – For brevity, only select state legislation is attached. Additional example state legistlation is available online or via request through the research project team.

S Bill 219

By: S ors Gooch of h 51s , B ch of h 21s , Mullis of h 53rd, H r r of h 7 h d W so of h 1s

AS PASSED

A BILL TO BE ENTITLED

AN ACT

To m d Ti l 40 of h Offici l Cod of G orgi A o d, r l i g o mo or v hicl s, so s o rovid for d fi i io s; o x m rso s o r i g fully u o omous mo or v hicl wi h h u om d drivi g sys m g g d from h r quir m o hold driv r's lic s ; o rovid for s isf c io of r quir m o o ify l w forc m i c r i i s c s of ccid s by fully u o omous mo or v hicl s; o rovid for c r i qui m d i sur c r quir m s for fully u o omous mo or v hicl s; o rovid for r gis r io r quir m s for such v hicl s; o rovid for x m io s from s b l r quir m s; o rovid for lic bili y; o rovid for limi io s o do io of c r i rul s d r gul io s; o rovid for r l d m rs; o r l co flic i g l ws; d for o h r ur os s.

BE IT ENACTED BY THE GENERAL ASSEMBLY OF GEORGIA:

SECTION 1.

Ti l 40 of h Offici l Cod of G orgi A o d, r l i g o mo or v hicl s, is m d d i Cod S c io 40-1-1, r l i g o d fi i io s, by r visi g r gr hs (15.2), (15.3), (17.2), d (38) d ddi g w r gr hs s follows:

"(5.1) 'Au om d drivi g sys m' m s h h rdw r d sof w r h r coll c iv ly c bl of rformi g h ir dy mic drivi g sk o sus i d b sis, r g rdl ss of wh h r i is limi d o s cific o r io l d sig dom i ."

"(15.2) 'Dy mic drivi g sk' m s ll of h r l- im o r io l d c ic l fu c io s r quir d o o r v hicl i o -ro d r ffic, xcludi g h s r gic fu c io s such s ri sch duli g d s l c io of d s i io s d w y oi s, i cludi g wi hou limi io :

(A) L r l v hicl mo io co rol vi s ri g;

(B) Lo gi udi l mo io co rol vi cc l r io d d c l r io ;

nhancing conspicuity via lighting, signaling, and gesturing

15 3 ' lectric assisted bicycle' means a device with two or three wheels which has a saddle and fully operative pedals for human propulsion and also has an electric motor or such a device to be considered an electric assisted bicycle, it shall meet the requirements of the ederal Motor Vehicle Safety Standards, as set forth in 49 C R Section 571, et seq , and shall operate in such a manner that the electric motor disengages or ceases to function when the brakes are applied The electric motor in an electric assisted bicycle shall:

A Have a power output of not more than 1,000 watts;

B Be incapable of propelling the device at a speed of more than 20 miles per hour on level ground; and

C Be incapable of further increasing the speed of the device when human power alone is used to propel the device at or more than 20 miles per hour

~~15 3~~ 15 4 ' lectric personal assistive mobility device' or ' AMD' means a self-balancing, two nontandem wheeled device designed to transport only one person and having an electric propulsion system with average power of 750 watts 1 horsepower and a maximum speed of less than 20 miles per hour on a paved level surface when powered solely by such propulsion system and ridden by an operator who weighs 170 pounds ″

″ 17 2 ' ully autonomous vehicle' means a motor vehicle equipped with an automated driving system that has the capability to perform all aspects of the dynamic driving task without a human driver within a limited or unlimited operational design domain and will not at any time request that a driver assume any portion of the dynamic driving task when the automated driving system is operating within its operational design domain

17 3 'Golf car' or 'golf cart' means any motorized vehicle designed for the purpose and exclusive use of conveying one or more persons and equipment to play the game of golf in an area designated as a golf course or such a vehicle to be considered a golf car or golf cart, its average speed shall be less than 15 miles per hour 24 kilometers per hour on a level road surface with a 0 5% grade 0 3 ~~degrees~~ degree comprising a straight course composed of a concrete or asphalt surface that is dry and free from loose material or surface contamination with a minimum coefficient of friction of 0 8 between tire and surface ″

″ 27 1 'Minimal risk condition' means a low-risk operating mode in which a fully autonomous vehicle operating without a human driver achieves a reasonably safe state,

7 1) 'Operational design domain' means a description of t e specific operating domains in w ic an automated driving system is designed to effectively operate, including but not limited to geograp ic limitations, roadway types, speed range, and environmental conditions suc as weat er and limited visibility

8) 'Operator' means any person w o drives or is in actual p ysical control of a motor ve icle or w o causes a fully autonomous ve icle to move or travel wit t e automated driving system engaged

SECTION 2.

Said title is furt er amended in Code Section 40-5-21, relating to exemptions to driver's license requirement, by revising paragrap s 11) and 12) and adding a new paragrap to subsection a) as follows:

11) Any resident w o is 15 years of age or over w ile taking actual in-car training in a training ve icle ot er t an a commercial motor ve icle under t e direct personal supervision of a driving instructor w en suc driving instructor and training ve icle are licensed by t e department in accordance wit t e provisions of C apter 1 of Title 4 , 'T e Driver Training Sc ool License Act ' As used in t e previous sentence, t e term 'commercial motor ve icle' s all ave t e meaning specified in Code Section 40-5-142 All ve icles utilized for t e in-car training aut orized under t is paragrap s all be equipped wit dual controlled brakes and s all be marked wit signs in accordance wit t e rules of t e department clearly identifying suc ve icles as training cars belonging to a licensed driving sc ool A driving instructor s all test t e eyesig t of any unlicensed person w o will be receiving actual in-car training prior to commencement of suc training, and no unlicensed driver s all receive in-car training unless suc person as at least t e visual acuity and orizontal field of vision as is required for issuance of a driver's license in subsection c) of Code Section 40-5-27; ~~and~~

12) Any person w ile operating a personal transportation ve icle:

A) On any way publicly maintained for t e use of personal transportation ve icles by t e public and no ot er types of motor ve icles in accordance wit a local ordinance adopted pursuant to art or 6 of Article 1 of C apter 6 of t is title; or

B) W en crossing a street or ig way used by ot er types of motor ve icles at a location designated for suc crossing pursuant to subsection d) of Code Section 40-6- 1 or pursuant to a TV plan aut orized by a local aut ority as described

ION 3.

Said title is further ame ded by addi g two ew Code sectio s to read as follows:

″40-6-279.

Notwithsta di g the provisio s of this chapter to the co trary, whe a accide t i volves a fully auto omous vehicle with the automated drivi g system e gaged, the requireme ts of subsectio (a) of Code Sectio s 40-6-270, 40-6-271, 40-6-272, 40-6-273, a d 40-6-273.1 shall be deemed satisfied if such fully auto omous vehicle remai s o the sce e of such accide t as required by law a d such fully auto omous vehicle or operator promptly co tacts a local law e forceme t age cy a d commu icates the i formatio required by this chapter.″

″40-8-11.

(a) A perso may operate a fully auto omous vehicle with the automated drivi g system e gaged without a huma driver bei g prese t i the vehicle, provided that such vehicle:

(1) U less a exemptio has bee gra ted u der applicable federal or state law, is capable of bei g operated i complia ce with Chapter 6 of this title a d this chapter a d has bee , at the time of its ma ufacture, certified by the ma ufacturer as bei g i complia ce with applicable federal motor vehicle safety sta dards;

(2) Has the capability to meet the requireme ts of Code Sectio 40-6-279;

(3) Ca achieve a mi imal risk co ditio i the eve t of a failure of the automated drivi g system that re ders that system u able to perform the e tire dy amic drivi g task releva t to its i te ded operatio al desig domai ;

(4)(A) U til December 31, 2019, is covered by motor vehicle liability coverage equivale t to 250 perce t of that which is required u der:

(i) I dem ity a d liability i sura ce equivale t to the limits specified i Code Sectio 40-1-166; or

(ii) Self-i sura ce pursua t to Code Sectio 33-34-5.1 equivale t to, at a mi imum, the limits specified i Code Sectio 40-1-166; a d

(B) O a d after Ja uary 1, 2020, is covered by motor vehicle liability coverage equivale t to, at a mi imum:

(i) I dem ity a d liability i sura ce equivale t to the limits specified i Code Sectio 40-1-166; or

(ii) Self-i sura ce pursua t to Code Sectio 33-34-5.1 equivale t to, at a mi imum,

t shall e the responsi ility of the occupants of a fully autonomous vehicle to comply with the requirements of Code Sections 0-8-76 and 0-8-76.1 regarding the use of safety elts and child passenger restraining systems.

c Unless otherwise provided in this Code section, fully autonomous vehicles, automated driving systems, and any commercial use or operation of fully autonomous vehicles shall e governed y this Code section, Code Sections 0-1-1 and 0-5-21, Chapter 6 of this title, and this chapter notwithstanding any other provision of law to the contrary. No rules or regulations relative to the operation of fully autonomous vehicles or automated driving systems shall e adopted which limit the authority to operate such vehicles or systems conferred y this Code section.″

SECTION 4.

All laws and parts of laws in conflict with this Act are repealed.

H Bill 472 (AS ASSED HOUSE AND SENATE)

By: R pr nt tiv Epp f th 144th, W t n f th 172nd, w ll f th 32nd, nd Sh w f th 176th

A BILL TO BE ENTITLED

AN ACT

T m nd Titl 40 f th Offici l C d f G rgi Ann t t d, r l ting t m t r v hicl nd tr ffic, t pr vid f r n xc pti n f r f ll wing r q ir m nt f r n n-l ding v hicl f ll wing in c rdin t d pl t n; t pr vid f r d finiti n; t pr vid f r r l t d m tt r ; t r p l c nflicting l w ; nd f r th r p rp .

BE IT ENACTED BY THE GENERAL ASSEMBLY OF GEORGIA:

SECTION 1.

Titl 40 f th Offici l C d f G rgi Ann t t d, r l ting t m t r v hicl nd tr ffic, i m nd d in C d S cti n 40-6-49, r l ting t f ll wing t cl ly, by dding n w b cti n t r d f ll w :

"( ) Thi C d cti n h ll n t pply t th p r t r f ny n n-l ding v hicl tr v ling in c rdin t d pl t n. F r p rp f thi b cti n, th t rm 'c rdin t d pl t n' m n gr p f m t r v hicl tr v ling in th m l n tilizing v hicl -t -v hicl c mm nic ti n t chn l gy t t m tic lly c rdin t th m v m nt f ch v hicl ."

SECTION 2.

All l w nd p rt f l w in c nflict with thi Act r r p l d.

KIM REYNOLDS
GOVERNOR

OFFICE OF THE GOVERNOR

ADAM GREGG
LT GOVERNOR

May 3, 2019

The Honorable Paul Pate
Secretary of State of Iowa
State Capitol
Des Moines, Iowa 50319

Dear Mr. Secretary,

I hereby transmit:

> Senate File 302, an Act relating to motor vehicles operated by an automated driving system, and making penalties applicable.

The above Senate File is hereby approved on this date.

Sincerely,

Kim Reynolds
Governor of Iowa

Senate File 302

AN ACT

RELATING TO MOTOR VEHICLES OPERATED BY AN AUTOMATED DRIVING SYSTEM, AND MAKING PENALTIES APPLICABLE.

BE IT ENACTED BY THE GENERAL ASSEMBLY OF THE STATE OF IOWA:

Section 1. NEW SECTION. **321.514 Definitions.**

As used in this section and sections 321.515 through 321.519, unless the context otherwise requires:

1. *"Automated driving system"* means the hardware and software collectively capable of performing the entire dynamic driving task on a sustained basis, regardless of whether the system is limited to a specific operational design domain, if any.

2. *"Conventional human driver"* means a natural person who manually controls the in-vehicle accelerating, braking, steering, and transmission gear selection input devices in order to operate a motor vehicle.

3. *"Driverless-capable vehicle"* means a system-equipped vehicle capable of performing the entire dynamic driving task within the automated driving system's operational design domain, if any, including but not limited to achievement of a minimal risk condition without intervention or supervision by a conventional human driver.

4. *"Dynamic driving task"* means all real-time operational and tactical functions required to operate a motor vehicle on a highway in traffic within an automated driving system's specific operational design domain, if any. *"Dynamic driving*

task" does not include any strategic function such as trip scheduling or the selection of destinations and waypoints.

5. *"Minimal risk condition"* means a reasonably safe state to which an automated driving system brings a system-equipped vehicle upon experiencing a performance-relevant failure of the system that renders the system unable to perform the entire dynamic driving task, including but not limited to removing the vehicle to the nearest shoulder if the vehicle is capable of doing so, bringing the vehicle to a complete stop, and activating the vehicle's emergency signal lamps.

6. *"On-demand driverless-capable vehicle network"* means a transportation service network that uses a software application or other digital means to dispatch driverless-capable vehicles for the purposes of transporting persons or goods, including transportation for hire as defined in section 325A.1, and public transportation.

7. *"Operational design domain"* means a set of constraints used to define the domain under which an automated driving system is designed to properly operate, including but not limited to types of highways, speed ranges, environmental conditions such as weather or time of day, and other constraints.

8. *"System-equipped vehicle"* means a motor vehicle equipped with an automated driving system.

Sec. 2. NEW SECTION. **321.515 Operation.**

1. A driverless-capable vehicle may operate on the public highways of this state without a conventional human driver physically present in the vehicle, if the vehicle meets all of the following conditions:

a. The vehicle is capable of achieving a minimal risk condition if a malfunction of the automated driving system occurs that renders the system unable to perform the entire dynamic driving task within the system's intended operational design domain, if any.

b. While in driverless operation, the vehicle is capable of operating in compliance with the applicable traffic and motor vehicle safety laws and regulations of this state that govern the performance of the dynamic driving task, unless an exemption has been granted to the vehicle by the department.

c. The vehicle has been certified by the vehicle's manufacturer to be in compliance with all applicable federal motor vehicle safety standards, except to the extent an exemption has been granted for the vehicle under applicable federal law or by the national highway traffic safety administration.

2. *a.* The operation of a system-equipped vehicle capable of performing the entire dynamic driving task within the automated driving system's operational design domain on the public highways of this state while a conventional human driver is present in the vehicle shall be lawful. During such operation, the conventional human driver shall possess a valid driver's license pursuant to section 321.174 and shall be subject to the financial liability coverage requirements and penalties set forth under section 321.20B. The conventional human driver shall operate the system-equipped vehicle according to the manufacturer's requirements and specifications, and shall regain manual control of the vehicle when prompted by the automated driving system.

b. An automated driving system, while engaged, shall be designed to operate within the system's operational design domain in compliance with the applicable traffic and motor vehicle safety laws and regulations of this state that govern the performance of the dynamic driving task, unless an exemption has been granted to the vehicle by the department.

3. Except as provided in this section, the motor vehicle laws of this state shall not be construed to require a conventional human driver to operate a driverless-capable vehicle that is being operated by an automated driving system. The automated driving system, while engaged, shall be deemed to fulfill any physical acts required of a conventional human driver to perform the dynamic driving task.

Sec. 3. NEW SECTION. **321.516 Insurance.**

Before a system-equipped vehicle is allowed to operate on the public highways of this state, the owner shall obtain financial liability coverage for the vehicle. A system-equipped vehicle shall not operate on the highways of this state unless financial liability coverage is in effect for the vehicle and unless proof of financial liability coverage is

carried in the vehicle pursuant to section 321.20B.

Sec. 4. NEW SECTION. **321.517 Accidents.**

In the event of an accident in which a system-equipped vehicle is involved, the vehicle shall remain at the scene of the accident and the operation of the vehicle shall otherwise comply with sections 321.261 through 321.273 where applicable and to the extent possible, and the vehicle's owner or a person on behalf of the vehicle's owner shall promptly report the accident to law enforcement authorities. If a system-equipped vehicle fails to remain at the scene of an accident or the operation of the vehicle fails to otherwise comply with sections 321.261 through 321.273 where applicable and to the extent possible as required by this section, the vehicle's failure shall be imputed to the vehicle's owner, and the vehicle's owner may be charged and convicted of a violation of sections 321.261 through 321.273, as applicable.

Sec. 5. NEW SECTION. **321.518 On-demand driverless-capable vehicle network.**

A person may operate an on-demand driverless-capable vehicle network. An on-demand driverless-capable vehicle network may be used to facilitate the transportation of persons or goods, including transportation for hire as defined in section 325A.1, and public transportation. An on-demand driverless-capable vehicle network may connect passengers to driverless-capable vehicles either exclusively or as part of a digital network that also connects passengers to conventional human drivers who provide transportation services, consistent with chapter 321N or any other applicable laws, in vehicles that are not driverless-capable vehicles.

Sec. 6. NEW SECTION. **321.519 Authority.**

1. Automated driving systems and system-equipped vehicles shall be governed by sections 321.514 through 321.518, this section, and all applicable traffic and motor vehicle safety laws and regulations of this state. Automated driving systems and system-equipped vehicles shall be regulated exclusively by the department. The department may adopt rules pursuant to chapter 17A to administer sections 321.514 through 321.518, and this section.

2. A political subdivision of the state shall not impose

requirements, including but not limited to performance standards, specific to the operation of system-equipped vehicles, automated driving systems, or on-demand driverless-capable vehicle networks that are in addition to the requirements set forth under sections 321.514 through 321.518. A political subdivision of the state shall not impose a tax on system-equipped vehicles, automated driving systems, or on-demand driverless-capable vehicle networks where such tax relates specifically to the operation of system-equipped vehicles, automated driving systems, or on-demand driverless-capable vehicle networks.

CHARLES SCHNEIDER
President of the Senate

LINDA UPMEYER
Speaker of the House

I hereby certify that this bill originated in the Senate and is known as Senate File 302, Eighty-eighth General Assembly.

W. CHARLES SMITHSON
Secretary of the Senate

Approved May 3rd, 2019

KIM REYNOLDS
Governor

EMERGENCY ALERTS

Coronavirus Update

Sign-up for COVID-19 alerts: Get notified by text, email, or phone in your preferred language. *Feb. 1st, 2021, 9:00 pm* Read more

For the latest information on COVID-19: Vaccines, Cases, Restrictions *Mar. 9th, 2021, 5:00 pm* Read more

HIDE ALERTS

Mass.gov

EXECUTIVE ORDER

No. 572: To Promote the Testing and Deployment of Highly Automated Driving Technologies

DATE:

10/20/2016

ISSUER:

Governor Charlie Baker

WHEREAS, recent innovations in sensing and computing technology have resulted in the rapid advancement of various levels of motor vehicle automation;

WHEREAS, the advancement of these technologies makes it foreseeable that motor vehicles could be capable of driving safely without the active control or monitoring by a human operator in the relatively near future;

WHEREAS, automotive companies already are deploying increasing levels of driver-assistance technologies in recent vehicle year models, and are expected to continue to deploy even more sophisticated technology in the near future, including so-called highly automated vehicles which can take full control of driving in at least some circumstances;

WHEREAS, the Commonwealth of Massachusetts is home to a world-class cluster of new and established companies and academic institutions leading the development and innovation of new robotics technologies, including software, sensors and other components used in highly automated motor vehicles;

WHEREAS, this Administration is committed to supporting the further safe development of these technologies in the Commonwealth as a means to foster innovation and economic growth, including by promoting their use

through the safe testing of certain highly automated driving technologies on designated public roadways in the Commonwealth, while at the same time remaining nimble as the technology continues to evolve;

WHEREAS, the widespread deployment of highly automated driving technologies holds the potential to transform transportation networks for the better, reducing crashes and fatalities for drivers and others, including pedestrians and cyclists, reducing traffic congestion and the emission of harmful greenhouse gases, reducing the need for parking facilities, and increasing mobility for those who cannot drive;

WHEREAS, in the absence of appropriate policy and regulation, the eventual widespread deployment of highly automated driving technologies could instead increase safety risks for drivers and other users, including pedestrians and cyclists, increasing traffic congestion and resulting vehicle miles travelled, and increased emissions of harmful greenhouse gases and exacerbating other social harms; and

WHEREAS, the United States Department of Transportation recently has promulgated a comprehensive Federal Automated Vehicles Policy, which recognizes that both state and federal governments play an important role in facilitating highly automated vehicles, ensuring they are safely deployed, and promoting the social benefits that may accrue from widespread deployment, while addressing the potential social harms, and which also encourages states to develop consistent rules and regulations so that vehicles may travel between states;

NOW, THEREFORE, I, CHARLES D. BAKER, Governor of the Commonwealth of Massachusetts, by virtue of the authority vested in me by the Constitution, Part 2, c. 2, § 1, Art. 1, do hereby order as follows:

Section 1. There shall be a special working group on autonomous vehicles ("AV Working Group"), which shall be chaired by the Secretary of Transportation or her designee. The AV Working Group shall include: the Secretary of Public Safety or his designee; the Secretary of Housing and Economic Development or his designee; the Registrar of Motor Vehicles or her designee; and the Highway Administrator of the Massachusetts Department of Transportation ("MassDOT") or his designee. The AV Working Group shall also include: one member designated by the Senate President; one member designated by the Speaker of the House; one member designated by the Senate Minority Leader; and one member designated by the House Minority Leader. The AV Working Group shall convene and consult with experts on motor vehicle safety and vehicle automation as necessary to implement this Order, and shall work with the Legislature on any proposed legislation necessary to protect the public welfare.

Section 2. The AV Working Group should continue to encourage the development of autonomous vehicles and their component parts in Massachusetts, and to that end shall work with companies in the sector to support innovation and development and consider proposing changes to statutes or regulations that would facilitate the widespread deployment of highly automated vehicles in Massachusetts while ensuring the safety of the public.

Section 3. As existing motor vehicles laws neither expressly allow nor expressly prohibit the testing of highly automated vehicles on public roadways in the Commonwealth, MassDOT, with input from the AV Working Group and other technical experts as deemed appropriate, shall issue guidance ("Guidance") to allow for the safe testing of such technologies on designated state highways and on other public roadways in municipalities that desire to permit such testing.

Section 4. The Guidance shall include a process for companies to obtain approval from MassDOT to test highly automated vehicles on state highways or other public or publicly accessible state roadways in the Commonwealth. Said process shall include a demonstration by the company: that such vehicles have passed a Registry of Motor Vehicles inspection; that they can be operated without undue risk to public safety; and an assurance from the company that a human being will be in the driver's seat or other location in the vehicle where the person can take immediate control of the vehicle if necessary. The Guidance shall require a memorandum of understanding ("MOU") by and between the company or other entity conducting such testing, MassDOT, and any municipality or state agency whose roadways would be used for testing. Any such MOU may require:

- information describing the entity's track record of testing, both on-road and off-road, and including any crash-related information;
- the results of any relevant safety assessment;
- information regarding any vehicles to be tested on the public ways;
- information regarding the operators of any such vehicles, including a description of the training that the operators have been provided;
- sufficient insurance coverage;
- a maximum speed of the vehicle during testing;
- that testing be confined to certain areas and certain times of day;
- the sharing of non-proprietary information generated during testing with the AV Working Group; and
- any other conditions necessary to ensure the public safety.

Section 5. The AV Working Group shall propose any necessary legislation to ensure (1) the safe operation of partially automated vehicles on roadways in the Commonwealth, and (2) that, after highly automated vehicles have completed appropriate testing and are in operation on the roadways in the Commonwealth, they are operated safely and in ways that advance the welfare of the residents of the Commonwealth.

Section 6. The AV Working Group shall follow developments in technology of automated vehicles, federal policy and the laws of other states and recommend any changes to this Order or to state statutes or regulations required to implement the purpose of this Order.

Section 7. This Order shall be interpreted to be consistent with federal law and policy as such laws and policies may be modified and amended from time to time.

Given at the Executive Chamber in Boston this 20th day of October in the year of our Lord two thousand sixteen and of the Independence of the United States of America two hundred forty-one.

Act No. 332
Public Acts of 2016
Approved by the Governor
December 9, 2016
Filed with the Secretary of State
December 9, 2016
EFFECTIVE DATE: December 9, 2016

STATE OF MICHIGAN
98TH LEGISLATURE
REGULAR SESSION OF 2016

Introduced by Senators Kowall, Jones, Stamas, Brandenburg, Warren, Hertel, Colbeck, Schmidt, Marleau, Horn, Ananich, Proos, Bieda, Knollenberg, Booher, Casperson, Emmons, Gregory, Hansen, Hood, Hopgood, Hune, Johnson, Knezek, MacGregor, Meekhof, Nofs, O'Brien, Pavlov, Robertson, Schuitmaker, Shirkey, Young and Zorn

ENROLLED SENATE BILL No. 995

AN ACT to amend 1949 PA 300, entitled "An act to provide for the registration, titling, sale, transfer, and regulation of certain vehicles operated upon the public highways of this state or any other place open to the general public or generally accessible to motor vehicles and distressed vehicles; to provide for the licensing of dealers; to provide for the examination, licensing, and control of operators and chauffeurs; to provide for the giving of proof of financial responsibility and security by owners and operators of vehicles; to provide for the imposition, levy, and collection of specific taxes on vehicles, and the levy and collection of sales and use taxes, license fees, and permit fees; to provide for the regulation and use of streets and highways; to create certain funds; to provide penalties and sanctions for a violation of this act; to provide for civil liability of manufacturers, the manufacturers of certain devices, the manufacturers of automated technology, upfitters, owners, and operators of vehicles and service of process on residents and nonresidents; to regulate the introduction and use of certain evidence; to regulate and certify the manufacturers of certain devices; to provide for approval and certification of installers and servicers of certain devices; to provide for the levy of certain assessments; to provide for the enforcement of this act; to provide for the creation of and to prescribe the powers and duties of certain state and local agencies; to impose liability upon the state or local agencies; to provide appropriations for certain purposes; to repeal all other acts or parts of acts inconsistent with this act or contrary to this act; and to repeal certain parts of this act on a specific date," by amending sections 2b, 204a, 602b, 643, 643a, and 665 (MCL 257.2b, 257.204a, 257.602b, 257.643, 257.643a, and 257.665), sections 2b and 665 as added and section 602 as amended by 2013 PA 231 and section 204a as amended by 2004 PA 362, and by adding sections 40c, 606b, and 665a; and to repeal acts and parts of acts.

The People of the State of Michigan enact:

Sec. 2b. (1) "Automated driving system" means hardware and software that are collectively capable of performing all aspects of the dynamic driving task for a vehicle on a part-time or full-time basis without any supervision by a human operator. As used in this subsection, "dynamic driving task" means all of the following, but does not include strategic aspects of a driving task, including, but not limited to, determining destinations or waypoints:

(a) Operational aspects, including, but not limited to, steering, braking, accelerating, and monitoring the vehicle and the roadway.

(b) Tactical aspects, including, but not limited to, responding to events, determining when to change lanes, turning, using signals, and other related actions.

(2) "Automated motor vehicle" means a motor vehicle on which an automated driving system has been installed, either by a manufacturer of automated driving systems or an upfitter that enables the motor vehicle to be operated without any control or monitoring by a human operator. Automated motor vehicle does not include a motor vehicle enabled with 1 or more active safety systems or operator assistance systems, including, but not limited to, a system to provide electronic blind spot assistance, crash avoidance, emergency braking, parking assistance, adaptive cruise control, lane-keeping assistance, lane departure warning, or traffic jam and queuing assistance, unless 1 or more of these technologies alone or in combination with other systems enable the vehicle on which any active safety systems or operator assistance systems are installed to operate without any control or monitoring by an operator.

(3) "Automated technology" means technology installed on a motor vehicle that has the capability to assist, make decisions for, or replace a human operator.

(4) "Automatic crash notification technology" means a vehicle service that integrates wireless communications and vehicle location technology to determine the need for or to facilitate emergency medical response in the event of a vehicle crash.

(5) "Manufacturer of automated driving systems" means a manufacturer or subcomponent system producer recognized by the secretary of state that develops or produces automated driving systems or automated vehicles.

(6) "Mobility research center" means a nonprofit entity that has the ability to receive and accept from any federal, state, or municipal agency, foundation, public or private agency, entity, or individual a grant, contribution, or loan for or in aid of the planning, construction, operation, upgrade, or financing of a facility for testing advanced transportation systems, including, but not limited to, connected or automated technology or automated motor vehicles to increase mobility options.

(7) "Motor vehicle manufacturer" means a person that has manufactured and distributed motor vehicles in the United States that are certified to comply with all applicable federal motor vehicle safety standards and that has submitted appropriate manufacturer identification information to the National Highway Traffic Safety Administration as provided in 49 CFR part 566. As used in this section, section 665a, and section 665b only, motor vehicle manufacturer also includes a person that satisfies all of the following:

(a) The person has manufactured automated motor vehicles in the United States that are certified to comply with all applicable federal motor vehicle safety standards.

(b) The person has operated automated motor vehicles using a test driver and with an automated driving system engaged on public roads in the United States for at least 1,000,000 miles.

(c) The person has obtained an instrument of insurance, surety bond, or proof of self-insurance in the amount of at least $10,000,000.00, and has provided evidence of that insurance, surety bond, or self-insurance to the department in a form and manner required by the department.

(8) "On-demand automated motor vehicle network" means a digital network or software application used to connect passengers to automated motor vehicles, not including commercial motor vehicles, in participating fleets for transportation between points chosen by passengers, for transportation between locations chosen by the passenger when the automated motor vehicle is operated by the automated driving system.

(9) "Participating fleet" means any of the following:

(a) Vehicles that are equipped with automated driving systems that are operating on the public roads and highways of this state in a SAVE project as provided in section 665b.

(b) Vehicles that are supplied or controlled by a motor vehicle manufacturer, and that are equipped with automated driving systems that are operating on the public roads and highways of this state in an on-demand automated motor vehicle network.

(10) "SAVE project" means an initiative that authorizes eligible motor vehicle manufacturers to make available to the public on-demand automated motor vehicle networks as provided in section 665b.

(11) "Upfitter" means a person that modifies a motor vehicle after it was manufactured by installing an automated driving system in that motor vehicle to convert it to an automated motor vehicle. Upfitter includes a subcomponent system producer recognized by the secretary of state that develops or produces automated driving systems.

Sec. 40c. "Platoon" means a group of individual motor vehicles that are traveling in a unified manner at electronically coordinated speeds.

Sec. 204a. (1) The secretary of state shall create and maintain a computerized central file that provides an individual historical driving record for a natural person with respect to all of the following:

(a) A license issued to the person under chapter III.

(b) A conviction, civil infraction determination, or other licensing action that is entered against the person for a violation of this act or a local ordinance substantially corresponding to a provision of this act, or that is reported to the secretary of state by another jurisdiction.

(c) A failure of the person, including a nonresident, to comply with a suspension issued pursuant to section 321a.

(d) A cancellation, denial, revocation, suspension, or restriction of the person's operating privilege, a failure to pay a department of state driver responsibility fee, or other licensing action regarding that person, under this act or that is reported to the secretary of state by another jurisdiction. This subdivision also applies to nonresidents.

(e) An accident in which the person is involved.

(f) A conviction of the person for an offense described in section 319e.

(g) Any driving record requested and received by the secretary of state under section 307.

(h) Any notice given by the secretary of state and the information provided in that notice under section 317(3) or (4).

(i) Any other information received by the secretary of state regarding the person that is required to be maintained as part of the person's driving record as provided by law.

(2) A secretary of state certified computer-generated or paper copy of an order, record, or paper maintained in the computerized central file of the secretary of state is admissible in evidence in the same manner as the original and is prima facie proof of the contents of and the facts stated in the original.

(3) An order, record, or paper generated by the computerized central file of the secretary of state may be certified electronically by the generating computer. The certification shall be a certification of the order, record, or paper as it appeared on a specific date.

(4) A court or the office of the clerk of a court of this state which is electronically connected by a terminal device to the computerized central file of the secretary of state may receive into and use as evidence in any case the computer-generated certified information obtained by the terminal device from the file. A duly authorized employee of a court of record of this state may order a record for an individual from a secretary of state computer terminal device located in, and under the control of, the court, and certify in writing that the document was produced from the terminal and that the document was not altered in any way.

(5) After receiving a request for information contained in records maintained under this section, the secretary of state shall provide the information, in a form prescribed by the secretary of state, to any of the following:

(a) Another state.

(b) The United States secretary of transportation.

(c) The person who is the subject of the record.

(d) A motor carrier employer or prospective motor carrier employer, but only if the person who is the subject of the record is first notified of the request as prescribed by the secretary of state.

(e) An authorized agent of a person or entity listed in subdivisions (a) to (d).

Sec. 602b. (1) Except as otherwise provided in this section, a person shall not read, manually type, or send a text message on a wireless 2-way communication device that is located in the person's hand or in the person's lap, including a wireless telephone used in cellular telephone service or personal communication service, while operating a motor vehicle that is moving on a highway or street in this state. As used in this subsection, a wireless 2-way communication device does not include a global positioning or navigation system that is affixed to the motor vehicle. This subsection does not apply to a person operating a commercial vehicle.

(2) Except as otherwise provided in this section, a person shall not read, manually type, or send a text message on a wireless 2-way communication device that is located in the person's hand or in the person's lap, including a wireless telephone used in cellular telephone service or personal communication service, while operating a commercial motor vehicle or a school bus on a highway or street in this state. As used in this subsection, a wireless 2-way communication device does not include a global positioning or navigation system that is affixed to the commercial motor vehicle or school bus.

(3) Except as otherwise provided in this section, a person shall not use a hand-held mobile telephone to conduct a voice communication while operating a commercial motor vehicle or a school bus on a highway, including while temporarily stationary due to traffic, a traffic control device, or other momentary delays. This subsection does not apply if the operator of the commercial vehicle or school bus has moved the vehicle to the side of, or off, a highway and has stopped in a location where the vehicle can safely remain stationary. As used in this subsection, "mobile telephone" does not include a 2-way radio service or citizens band radio service. As used in this subsection, "use a hand-held mobile telephone" means 1 or more of the following:

(a) Using at least 1 hand to hold a mobile telephone to conduct a voice communication.

(b) Dialing or answering a mobile telephone by pressing more than a single button.

(c) Reaching for a mobile telephone in a manner that requires a driver to maneuver so that he or she is no longer in a seated driving position, restrained by a seat belt that is installed as required by 49 CFR 393.93 and adjusted in accordance with the vehicle manufacturer's instructions.

(4) Subsections (1), (2), and (3) do not apply to an individual who is using a device described in subsection (1) or (3) to do any of the following:

(a) Report a traffic accident, medical emergency, or serious road hazard.

(b) Report a situation in which the person believes his or her personal safety is in jeopardy.

(c) Report or avert the perpetration or potential perpetration of a criminal act against the individual or another person.

(d) Carry out official duties as a police officer, law enforcement official, member of a paid or volunteer fire department, or operator of an emergency vehicle.

(e) Operate or program the operation of an automated motor vehicle while testing or operating the automated motor vehicle without a human operator.

(5) Subsection (1) does not apply to a person using an on-demand automated motor vehicle network.

(6) An individual who violates this section is responsible for a civil infraction and shall be ordered to pay a civil fine as follows:

(a) For a first violation, $100.00.

(b) For a second or subsequent violation, $200.00.

(7) This section supersedes all local ordinances regulating the use of a communications device while operating a motor vehicle in motion on a highway or street, except that a unit of local government may adopt an ordinance or enforce an existing ordinance substantially corresponding to this section.

Sec. 606b. (1) As provided in this act, an on-demand automated motor vehicle network may be operated on a highway, road, or street in this state.

(2) A local unit of government shall not impose a local fee, registration, franchise, or regulation upon an on-demand automated motor vehicle network. This subsection does not apply after December 31, 2022. Nothing in this section limits local authority, or state authority over roads and rights-of-way, with respect to communications networks or facilities.

Sec. 643. (1) The operator of a motor vehicle shall not follow another vehicle more closely than is reasonable and prudent, having due regard for the speed of the vehicles and the traffic upon and the condition of the highway.

(2) Except as provided in subsection (4), a person shall not operate a motor vehicle with a gross weight, loaded or unloaded, in excess of 5,000 pounds outside the corporate limits of a city or village, within 500 feet of a like vehicle described in this subsection, moving in the same direction, except when overtaking and passing the vehicle.

(3) Except as provided in subsection (4), a distance of not less than 500 feet shall be maintained between 2 or more driven vehicles being delivered from 1 place to another.

(4) Subsections (2) and (3) do not apply to a vehicle in a platoon.

(5) A person who violates this section is responsible for a civil infraction.

Sec. 643a. (1) The operator of a truck or truck tractor, when traveling upon a highway outside of a business or residence district, when conditions permit, shall leave sufficient space between the vehicle and another truck or truck tractor so that an overtaking vehicle may enter and occupy the space without danger. This subsection does not prevent the operator of a truck or truck tractor from overtaking and passing another truck, truck tractor, or other vehicle in a lawful manner.

(2) When traveling upon a highway, the operator of a truck or truck tractor that is in a platoon shall allow reasonable access for other vehicles to afford those vehicles safe movement among lanes to exit or enter the highway.

(3) A person who violates this section is responsible for a civil infraction.

Sec. 665. (1) Before beginning research or testing on a highway or street in this state of an automated motor vehicle, technology that allows a motor vehicle to operate without a human operator, or any automated driving system installed in a motor vehicle under this section, the manufacturer of automated driving systems or upfitter performing that research or testing shall submit proof satisfactory to the secretary of state that the vehicle is insured under chapter 31 of the insurance code of 1956, 1956 PA 218, MCL 500.3101 to 500.3179.

(2) A manufacturer of automated driving systems or upfitter shall ensure that all of the following circumstances exist when researching or testing the operation, including operation without a human operator, of an automated motor vehicle or any automated technology or automated driving system installed in a motor vehicle upon a highway or street:

(a) The vehicle is operated only by an employee, contractor, or other person designated or otherwise authorized by that manufacturer of automated driving systems or upfitter. This subdivision does not apply to a university researcher or an employee of the state transportation department or the department described in subsection (3).

(b) An individual described in subdivision (a) has the ability to monitor the vehicle's performance while it is being operated on a highway or street in this state and, if necessary, promptly take control of the vehicle's movements. If the individual does not, or is unable to, take control of the vehicle, the vehicle shall be capable of achieving a minimal risk condition.

(c) The individual operating the vehicle under subdivision (a) and the individual who is monitoring the vehicle for purposes of subdivision (b) may lawfully operate a motor vehicle in the United States.

(3) A university researcher or an employee of the state transportation department or the department who is engaged in research or testing of automated motor vehicles may operate an automated motor vehicle if the operation is in compliance with subsection (2).

(4) An automated motor vehicle may be operated on a street or highway in this state.

(5) When engaged, an automated driving system allowing for operation without a human operator shall be considered the driver or operator of a vehicle for purposes of determining conformance to any applicable traffic or motor vehicle laws and shall be deemed to satisfy electronically all physical acts required by a driver or operator of the vehicle.

(6) The Michigan council on future mobility is created within the state transportation department. The council shall provide to the governor, legislature, department, state transportation department, department of insurance and financial services, department of technology, management, and budget, and department of state police recommendations for changes in state policy to ensure that this state continues to be the world leader in autonomous, driverless, and connected vehicle technology. The council created under this subsection shall consist of all of the following members, who shall serve without compensation:

(a) Eleven individuals appointed by the governor who represent the interests of local government or are business, policy, research, or technological leaders in future mobility. The individuals appointed under this subdivision shall be voting members.

(b) One individual appointed by the governor who is representative of insurance interests. The individual appointed under this subdivision shall be a voting member.

(c) Two state senators appointed by the senate majority leader to serve as nonvoting ex officio members. One of the senators appointed under this subdivision shall be a member of the majority party, and 1 of the senators appointed under this subdivision shall be a member of the minority party.

(d) Two state representatives appointed by the speaker of the house of representatives to serve as nonvoting ex officio members. One of the representatives appointed under this subdivision shall be a member of the majority party, and 1 of the representatives appointed under this subdivision shall be a member of the minority party.

(e) The secretary of state or his or her designee. The individual appointed under this subdivision shall be a voting member.

(f) The director of the state transportation department or his or her designee. The individual appointed under this subdivision shall be a voting member.

(g) The director of the department of state police or his or her designee. The individual appointed under this subdivision shall be a voting member.

(h) The director of the department of insurance and financial services or his or her designee. The individual appointed under this subdivision shall be a voting member.

(i) The director of the department of technology, management, and budget or his or her designee. The individual appointed under this subdivision shall be a voting member.

(7) The governor shall designate 1 or more of the members of the commission to serve as chairperson of the commission who shall serve at the governor's pleasure.

(8) The council created under subsection (6) shall submit recommendations for statewide policy changes and updates no later than March 31, 2017 and shall continue to make recommendations annually thereafter, or more frequently in the commission's discretion.

(9) A person may operate a platoon on a street or highway of this state if the person files a plan for general platoon operations with the department of state police and the state transportation department before starting platoon operations. If the plan is not rejected by either the department of state police or the state transportation department within 30 days after receipt of the plan, the person shall be allowed to operate the platoon.

(10) All of the following apply to a platoon:

(a) Vehicles in a platoon shall not be considered a combination of vehicles for purposes of this act.

(b) The lead vehicle in a platoon shall not be considered to draw the other vehicles.

(c) If the platoon includes a commercial motor vehicle, an appropriately endorsed driver who holds a valid commercial driver license shall be present behind the wheel of each commercial motor vehicle in the platoon.

Act No. 333
Public Acts of 2016
Approved by the Governor
December 8, 2016
Filed with the Secretary of State
December 9, 2016
EFFECTIVE DATE: December 9, 2016

STATE OF MICHIGAN
98TH LEGISLATURE
REGULAR SESSION OF 2016

Introduced by Senators Kowall, Jones, Stamas, Brandenburg, Warren, Hertel, Colbeck, Schmidt, Marleau, Horn, Ananich, Proos, Bieda, Knollenberg, Booher, Casperson, Emmons, Gregory, Hansen, Hildenbrand Hood, Hopgood, Hune, Johnson, Knezek, Meekhof, Nofs, O'Brien, Pavlov, Robertson, Schuitmaker, Shirkey, Young and Zorn

ENROLLED SENATE BILL No. 996

AN ACT to amend 1949 PA 300, entitled "An act to provide for the registration, titling, sale, transfer, and regulation of certain vehicles operated upon the public highways of this state or any other place open to the general public or generally accessible to motor vehicles and distressed vehicles; to provide for the licensing of dealers; to provide for the examination, licensing, and control of operators and chauffeurs; to provide for the giving of proof of financial responsibility and security by owners and operators of vehicles; to provide for the imposition, levy, and collection of specific taxes on vehicles, and the levy and collection of sales and use taxes, license fees, and permit fees; to provide for the regulation and use of streets and highways; to create certain funds; to provide penalties and sanctions for a violation of this act; to provide for civil liability of manufacturers, the manufacturers of certain devices, the manufacturers of automated technology, upfitters, owners, and operators of vehicles and service of process on residents and nonresidents; to regulate the introduction and use of certain evidence; to regulate and certify the manufacturers of certain devices; to provide for approval and certification of installers and servicers of certain devices; to provide for the levy of certain assessments; to provide for the enforcement of this act; to provide for the creation of and to prescribe the powers and duties of certain state and local agencies; to impose liability upon the state or local agencies; to provide appropriations for certain purposes; to repeal all other acts or parts of acts inconsistent with this act or contrary to this act; and to repeal certain parts of this act on a specific date," (MCL 257.1 to 257.923) by adding section 665b.

The People of the State of Michigan enact:

Sec. 665b. (1) A motor vehicle manufacturer may participate in a SAVE project if it self-certifies to all of the following:

(a) That it is a motor vehicle manufacturer. A person that is not a motor vehicle manufacturer may not participate in a SAVE project.

(b) That each vehicle in the participating fleet is owned or controlled by the motor vehicle manufacturer and is equipped with all of the following:

(*i*) An automated driving system.

(*ii*) Automatic crash notification technology.

(*iii*) A data recording system that has the capacity to record the automated driving system's status and other vehicle attributes including, but not limited to, speed, direction, and location during a specified time period before a crash as determined by the motor vehicle manufacturer.

(c) That the participating fleet complies with all applicable state and federal laws.

(d) That each vehicle in the participating fleet is capable of being operated in compliance with applicable traffic and motor vehicle laws of this state.

(2) A motor vehicle manufacturer's eligibility to participate in a SAVE project under this section is conditioned solely upon meeting the requirements of this section. A motor vehicle manufacturer shall verify its satisfaction of the requirements of this section using the self-certification described in subsection (1).

(3) All of the following apply to a motor vehicle manufacturer that participates in a SAVE project:

(a) The motor vehicle manufacturer may commence a SAVE project at any time after it notifies the department that it has self-certified as provided in subsection (1). The notification required by this subdivision shall also set forth the geographical boundaries for the SAVE project. A motor vehicle manufacturer may make multiple notifications under this subsection.

(b) The motor vehicle manufacturer may participate in a SAVE project under any terms it deems appropriate so long as the terms are consistent with this section and other applicable law.

(c) The motor vehicle manufacturer shall determine the geographical boundaries for a SAVE project, which may include, but are not limited to, any of the following:

(*i*) A designated area within a municipality.

(*ii*) An area maintained by a regional authority.

(*iii*) A university campus.

(*iv*) A development that caters to senior citizens.

(*v*) A geographic or demographic area that is similar to the areas described in subparagraphs (*i*) to (*iv*).

(d) Public operation of a participating fleet shall be confined to the boundaries selected by the motor vehicle manufacturer under subdivision (c).

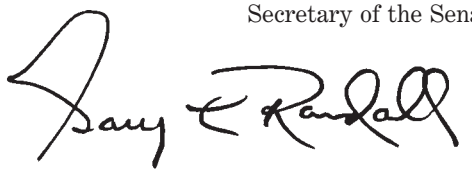
(e) For the duration of a SAVE project, the motor vehicle manufacturer shall maintain incident records and provide periodic summaries related to the safety and efficacy of travel of the participating fleet to the department and the National Highway Traffic Safety Administration.

(f) An individual who participates in a SAVE project is deemed by his or her participation to have consented to the collection of the information described in subdivision (e) while he or she is in a vehicle that is part of the participating fleet and to the provision of the summaries to the department and the National Highway Traffic Safety Administration as described in subdivision (e). Before commencing a SAVE project, and for the duration of the SAVE project, the motor vehicle manufacturer shall make publicly available a privacy statement disclosing its data handling practices in connection with the applicable participating fleet.

(4) When engaged, an automated driving system or any remote or expert-controlled assist activity shall be considered the driver or operator of the vehicle for purposes of determining conformance to any applicable traffic or motor vehicle laws and shall be deemed to satisfy electronically all physical acts required by a driver or operator of the vehicle. A motor vehicle manufacturer shall insure each vehicle in a participating fleet as required under this act and chapter 31 of the insurance code of 1956, 1956 PA 218, MCL 500.3101 to 500.3179. For each SAVE project in which it participates, during the time that an automated driving system is in control of a vehicle in the participating fleet, a motor vehicle manufacturer shall assume liability for each incident in which the automated driving system is at fault, subject to chapter 31 of the insurance code of 1956, 1956 PA 218, MCL 500.3101 to 500.3179.

This act is ordered to take immediate effect.

Secretary of the Senate



Clerk of the House of Representatives

Approved .....

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Governor

Act No. 334
Public Acts of 2016
Approved by the Governor
December 8, 2016
Filed with the Secretary of State
December 9, 2016
EFFECTIVE DATE: December 9, 2016

STATE OF MICHIGAN
98TH LEGISLATURE
REGULAR SESSION OF 2016

Introduced by Senators Warren, Kowall, Jones, Stamas, Brandenburg, Hertel, Colbeck, Schmidt, Marleau, Horn, Ananich, Bieda, Booher, Casperson, Emmons, Gregory, Hansen, Hildenbrand, Hood, Hopgood, Hune, Johnson, Knezek, MacGregor, Meekhof, Nofs, O'Brien, Pavlov, Proos, Robertson, Schuitmaker, Shirkey, Young and Zorn

ENROLLED SENATE BILL No. 997

AN ACT to amend 1949 PA 300, entitled "An act to provide for the registration, titling, sale, transfer, and regulation of certain vehicles operated upon the public highways of this state or any other place open to the general public or generally accessible to motor vehicles and distressed vehicles; to provide for the licensing of dealers; to provide for the examination, licensing, and control of operators and chauffeurs; to provide for the giving of proof of financial responsibility and security by owners and operators of vehicles; to provide for the imposition, levy, and collection of specific taxes on vehicles, and the levy and collection of sales and use taxes, license fees, and permit fees; to provide for the regulation and use of streets and highways; to create certain funds; to provide penalties and sanctions for a violation of this act; to provide for civil liability of manufacturers, the manufacturers of certain devices, the manufacturers of automated technology, upfitters, owners, and operators of vehicles and service of process on residents and nonresidents; to regulate the introduction and use of certain evidence; to regulate and certify the manufacturers of certain devices; to provide for approval and certification of installers and servicers of certain devices; to provide for the levy of certain assessments; to provide for the enforcement of this act; to provide for the creation of and to prescribe the powers and duties of certain state and local agencies; to impose liability upon the state or local agencies; to provide appropriations for certain purposes; to repeal all other acts or parts of acts inconsistent with this act or contrary to this act; and to repeal certain parts of this act on a specific date," by amending section 601a (MCL 257.601a), as amended by 2011 PA 115.

The People of the State of Michigan enact:

Sec. 601a. (1) A county, city, township, or village may contract with a person who owns or is in charge of a private road that is open to the general public, at that person's request or with that person's consent, to enforce provisions of this act on that private road.

(2) Subject to subsection (1) and section 906, a peace officer may enter upon a private road that is open to the general public to enforce provisions of this act if signs meeting the requirements of the Michigan manual of uniform traffic control devices are posted on the private road.

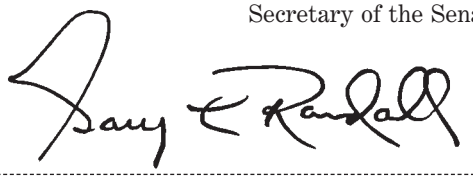
(3) The owner or person in charge of a private road open to the general public who enters into a contract as described in subsection (1) is responsible for the cost and the posting of signs described in subsection (2).

(4) This section does not affect a contract entered into between a county, city, township, or village and the person who owns or is in charge of a private road open to the general public before December 29, 2006.

(5) As used in this section, "private road that is open to the general public" does not include a road that is under the control of a mobility research center, regardless of whether a private research entity or a corporation is using the road under an agreement with the mobility research center.

This act is ordered to take immediate effect.

Secretary of the Senate



Clerk of the House of Representatives

Approved .....

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Governor

Act No. 335
Public Acts of 2016
Approved by the Governor
December 8, 2016
Filed with the Secretary of State
December 9, 2016
EFFECTIVE DATE: March 9, 2017

STATE OF MICHIGAN
98TH LEGISLATURE
REGULAR SESSION OF 2016

Introduced by Senators Horn, Kowall, Jones, Stamas, Brandenburg, Warren, Hertel, Schmidt, Marleau, Ananich, Bieda, Knollenberg, Booher, Casperson, Emmons, Gregory, Hansen, Hildenbrand, Hood, Hopgood, Hune, Johnson, Knezek, MacGregor, Meekhof, Nofs, Pavlov, Proos, Robertson, Schuitmaker, Shirkey, Young and Zorn

ENROLLED SENATE BILL No. 998

AN ACT to amend 1961 PA 236, entitled "An act to revise and consolidate the statutes relating to the organization and jurisdiction of the courts of this state; the powers and duties of the courts, and of the judges and other officers of the courts; the forms and attributes of civil claims and actions; the time within which civil actions and proceedings may be brought in the courts; pleading, evidence, practice, and procedure in civil and criminal actions and proceedings in the courts; to provide for the powers and duties of certain state governmental officers and entities; to provide remedies and penalties for the violation of certain provisions of this act; to repeal all acts and parts of acts inconsistent with or contravening any of the provisions of this act; and to repeal acts and parts of acts," by amending section 2949b (MCL 600.2949b), as added by 2013 PA 251.

The People of the State of Michigan enact:

Sec. 2949b. (1) The manufacturer of a vehicle is not liable and must be dismissed from any action for alleged damages resulting from any of the following unless the defect from which the damages resulted was present in the vehicle when it was manufactured:

(a) The conversion or attempted conversion of the vehicle into an automated motor vehicle by another person.

(b) The installation of equipment in the vehicle by another person to convert it into an automated motor vehicle.

(c) The modification by another person of equipment that was installed by the manufacturer in an automated motor vehicle specifically for using the vehicle in automatic mode.

(2) A subcomponent system producer recognized as described in section 244 of the Michigan vehicle code, 1949 PA 300, MCL 257.244, is not liable in a product liability action for damages resulting from the modification of equipment installed by the subcomponent system producer to convert a vehicle to an automated motor vehicle unless the defect from which the damages resulted was present in the equipment when it was installed by the subcomponent system producer.

(3) A motor vehicle mechanic or a motor vehicle repair facility that repairs an automated motor vehicle according to specifications from the manufacturer of the automated motor vehicle is not liable in a product liability action for damages resulting from the repairs.

(4) Sections 2945 to 2949a do not apply in a product liability action to the extent that they are inconsistent with this section.

(5) As used in this section:

(a) "Automated motor vehicle" means that term as defined in section 2b of the Michigan vehicle code, 1949 PA 300, MCL 257.2b.

(b) "Automatic mode" means that term as defined in section 2b of the Michigan vehicle code, 1949 PA 300, MCL 257.2b.

(c) "Motor vehicle mechanic" means that term as defined in section 2 of the motor vehicle service and repair act, 1974 PA 300, MCL 257.1302.

(d) "Motor vehicle repair facility" means that term as defined in section 2 of the motor vehicle service and repair act, 1974 PA 300, MCL 257.1302.

(e) "Vehicle" means that term as defined in section 79 of the Michigan vehicle code, 1949 PA 300, MCL 257.79.

Enacting section 1. This amendatory act takes effect 90 days after the date it is enacted into law.

This act is ordered to take immediate effect.

Secretary of the Senate

Clerk of the House of Representatives

Approved .....

Governor

Act No. 323
Public Acts of 2018
Approved by the Governor
June 28, 2018
Filed with the Secretary of State
July 2, 2018
EFFECTIVE DATE: July 2, 2018

STATE OF MICHIGAN
99TH LEGISLATURE
REGULAR SESSION OF 2018

Introduced by Rep. VerHeulen

ENROLLED HOUSE BILL No. 5335

AN ACT to create the Michigan infrastructure council; and to prescribe the powers and duties of certain state and local agencies and officials.

The People of the State of Michigan enact:

Sec. 1. This act shall be known and may be cited as the "Michigan infrastructure council act".

Sec. 2. As used in this act:

(a) "Asset" means infrastructure related to drinking water, wastewater, stormwater, transportation, energy, or communications, including, but not limited to, drinking water supply systems, wastewater systems, stormwater systems, drains, roads, bridges, broadband and communication systems, and electricity and natural gas networks.

(b) "Asset class" means a single type of asset including its network and all associated appurtenances critical to its performance.

(c) "Asset management" means an ongoing process of maintaining, preserving, upgrading, and operating physical assets cost-effectively, based on a continuous physical inventory and condition assessment and investment to achieve performance goals.

(d) "Asset management plan" means a set of procedures to manage assets through their life cycles, based on principles of life cycle costing. An asset management plan may be used as a tool to help an asset owner implement its asset management program.

(e) "Asset owner" means a person that owns or operates an asset.

(f) "Department" means the department of treasury.

(g) "Performance goals" means standards of system performance that reflect asset management principles for asset preservation and sustainability, operations, capacity consistent with local needs, and identified levels of service.

(h) "Person" means an individual, partnership, corporation, association, governmental entity, or other legal entity.

(i) "Region" means the geographic jurisdiction of any of the following:

(*i*) A regional planning commission created pursuant to 1945 PA 281, MCL 125.11 to 125.25.

(*ii*) A regional economic development commission created pursuant to 1966 PA 46, MCL 125.1231 to 125.1237.

(*iii*) A metropolitan area council formed pursuant to the metropolitan councils act, 1989 PA 292, MCL 124.651 to 124.729.

(*iv*) A metropolitan planning organization established pursuant to federal law.

(*v*) An agency directed and funded by section 822f of article VIII of 2016 PA 268, to engage in joint decision-making practices related, but not limited to, community development, economic development, talent, and infrastructure opportunities.

(j) "Transportation asset management council" means the transportation asset management council created in section 9a of 1951 PA 51, MCL 247.659a.

(k) "Water asset management council" means the water asset management council created in section 5002 of the natural resources and environmental protection act, 1994 PA 451, MCL 324.5002.

Sec. 3. (1) The Michigan infrastructure council is created within the department.

(2) The Michigan infrastructure council consists of the following:

(a) Nine voting members appointed pursuant to subsection (3) who are representative of 1 or more of the following:

(*i*) Asset management experts from the public and private sectors with knowledge of and expertise in the areas of planning, design, construction, management, operations and maintenance for drinking water, wastewater, stormwater, transportation, energy, and communications.

(*ii*) Financial and procurement experts from the public or private sector.

(*iii*) Experts in regional asset management planning across jurisdictions and infrastructure sectors.

(b) The following nonvoting members:

(*i*) The chairperson of the water asset management council or his or her designee.

(*ii*) The chairperson of the transportation asset management council or his or her designee.

(*iii*) The director of the department of agriculture and rural development or his or her designee.

(*iv*) The director of the department of environmental quality or his or her designee.

(*v*) The director of the department of natural resources or his or her designee.

(*vi*) The director of the department of technology, management, and budget or his or her designee.

(*vii*) The director of the state transportation department or his or her designee.

(*viii*) The state treasurer or his or her designee.

(*ix*) The chairperson of the Michigan public service commission or his or her designee.

(3) Voting members of the Michigan infrastructure council under subsection (2)(a) shall be appointed as follows:

(a) Five by the governor.

(b) One by the senate majority leader.

(c) One by the speaker of the house of representatives.

(d) One by the senate minority leader.

(e) One by the house minority leader.

(4) The voting members first appointed to the Michigan infrastructure council must be appointed within 60 days after the effective date of this act.

(5) The voting members of the Michigan infrastructure council serve for terms of 3 years or until a successor is appointed, whichever is later, except as follows:

(a) Of the members first appointed under subsection (3)(a), 1 shall serve for 2 years, 1 shall serve for 1 year, and 3 shall serve for 3 years.

(b) Of the members first appointed under subsection (3)(b), (c), (d), and (e), 2 shall serve for 2 years and 2 shall serve for 1 year.

(6) A vacancy on the Michigan infrastructure council shall be filled for the unexpired term in the same manner as the original appointment.

(7) A member of the Michigan infrastructure council may be removed for incompetence, dereliction of duty, malfeasance during his or her tenure in office, or any other cause considered appropriate by the office for whom the appointment was made.

(8) The governor shall call the first meeting of the Michigan infrastructure council within 90 days after the effective date of this act. At the first meeting, the Michigan infrastructure council shall elect from among its members a chairperson and other officers as it considers appropriate. After the first meeting, the Michigan infrastructure council shall meet at least quarterly, or more frequently at the call of the chairperson or if requested by 3 or more members.

(9) A majority of the voting members of the Michigan infrastructure council and a majority of the nonvoting members of the Michigan infrastructure council constitute a quorum for the transaction of business at a meeting of the Michigan infrastructure council. An affirmative vote of a majority of the voting members of the Michigan infrastructure council is required for official action of the Michigan infrastructure council.

(10) The Michigan infrastructure council shall perform its business at a public meeting of the Michigan infrastructure council held in compliance with the open meetings act, 1976 PA 267, MCL 15.261 to 15.275.

(11) A writing created by the Michigan infrastructure council in the performance of an official function is subject to the freedom of information act, 1976 PA 442, MCL 15.231 to 15.246.

(12) Members of the Michigan infrastructure council serve without compensation. However, members of the Michigan infrastructure council may be reimbursed for their actual and necessary expenses incurred in the performance of their official duties as members of the Michigan infrastructure council.

(13) The departments of agriculture and rural development; environmental quality; natural resources; technology, management, and budget; transportation; and treasury shall provide qualified administrative and technical staff to the Michigan infrastructure council.

(14) The department of technology, management, and budget shall serve as the central data storage agency for the statewide database provided for in this act.

Sec. 4. (1) The Michigan infrastructure council shall do all of the following:

(a) Develop a multiyear program, work plan, budget, and funding recommendation for asset management; update these every year; and provide these to the governor and the legislature by September 30 every year.

(b) Ensure that the work plan in subdivision (a) includes an emphasis on coordination and integration across asset classes and regions.

(c) Prepare an annual report on the current statewide asset management assessment that tracks progress on established performance goals.

(d) Undertake research and advise on matters relating to asset management, including all of the following:

(*i*) Funding and financing models.

(*ii*) Best practices.

(*iii*) Information technology advancements.

(*iv*) Emerging technology to advance smart systems.

(*v*) Right sizing and cost-efficiencies.

(*vi*) Impediments to delivery.

(*vii*) Opportunities for greater coordination and collaboration across asset classes and asset owners.

(*viii*) Align and link state incentives to asset performance improvement goals, including cost control, asset management, operational efficiency, and cost-effective regional solutions.

(e) Within 180 days after its first meeting, evaluate the regional infrastructure asset management pilot program created under Executive Directive 2017-1, and the findings of the 21st Century Infrastructure Commission created in Executive Order No. 2016-5, and develop and publish a 3-year strategy for establishing a statewide integrated asset management system. The initial multiyear program, work plan, budget, and funding recommendation under subdivision (a) must include development of the strategy for establishing a statewide integrated asset management system. The strategy must also include, at a minimum, all of the following:

(*i*) A determination of appropriate assets within the asset classes.

(*ii*) Consistent data standards and definitions for each asset class.

(*iii*) Identify and designate a process to plan, analyze, and coordinate asset management across assets and asset owners at the regional level. This process may be implemented through regional planning agencies, the regional prosperity initiative regions, or another approach, which may vary among regions, that ensures all areas of the state are included and efforts are consistent with state and federal requirements. Regions shall be responsible for maintaining and managing the statewide database at a regional level.

(*iv*) Procedures for data storage, collecting, updating, and reporting.

(*v*) Recommendations related to the appropriate level of financial support for local asset data collection, local development of asset management plans, regional review and collaboration, and participation in an integrated statewide asset management system.

(*vi*) A process to coordinate the planning efforts of the transportation asset management council, the water asset management council, the Michigan public service commission, and the Michigan economic development corporation, with other state-required asset management planning requirements. In coordinating planning efforts under this subparagraph, the Michigan infrastructure council shall endeavor to provide efficiencies to the planning process and to reduce any unnecessary duplication of effort.

(*vii*) Coordination with the transportation asset management council and the water asset management council to ensure that training and education programs that address all of the following are coordinated across assets:

(A) Asset management principles and plan development.

(B) The use of the statewide database.

(C) Ongoing user support.

(D) State department asset management requirements.

(*viii*) Develop statewide performance goals for appropriate assets within each asset class and identify regional and statewide progress toward meeting performance goals.

(*ix*) Protocols that ensure data security and accuracy at the local, regional, and state levels.

(*x*) Development of consistent and coordinated state department, transportation asset management council, and water asset management council asset management plan components and requirements including, but not limited to:

(A) Asset inventory, condition assessment, and uniform data.

(B) Performance goals.

(C) Revenue structure, investment strategy, and capital improvement plan.

(D) Asset criticality and risk analysis.

(E) Public engagement and transparency.

(F) Self-assessment of asset management maturity.

(G) Reports at an asset owner, regional, and statewide level. Reporting levels should take into account the size and complexity of the network or system. Priority should be placed on the largest systems.

(H) A resolution by the appropriate governing body approving the plan.

(I) Certification that asset management is being coordinated to the asset owners' best ability across asset classes and regionally.

(f) Beginning 3 years after the effective date of this act, start the second phase of the statewide system for asset management implementation and include, at a minimum, all of the following:

(*i*) Predictive analytics to forecast asset condition.

(*ii*) A public dashboard of state, regional, and local system performance across asset classes, including the appropriate and secure level of geospatial data and aggregated reporting.

(*iii*) Develop and publish a 30-year integrated infrastructure strategy that is updated every 5 years and includes all of the following:

(A) Current statewide condition assessment and infrastructure priorities across asset classes, tracked progress on established performance goals, and net changes in asset value.

(B) Investment needs to reach targeted overall system ratings and performance goals, with a goal of leveling annual investments to long-term predictable amounts.

(C) Network intelligence in asset management planning and monitoring. Retrofit technologies should be considered, pursued, and incorporated as they become available for upgrades and maintenance activities to existing and future assets.

(2) The multiyear programs, work plans, budgets, and funding recommendations required in subsection (1)(a), the annual reports required by subsection (1)(c), the 3-year strategy for establishing a statewide integrated asset management system required by subsection (1)(e), and the second phase of the statewide system for asset management implementation required in subsection (1)(f) shall comply with both of the following:

(a) Not propose, recommend, or fund any government-owned broadband or telecommunications network to provide service to residential or commercial premises, except that this prohibition does not apply to state expenditures for a transportation purpose, connected vehicle communication technologies, or other transportation-related activities.

(b) To the extent government funding is proposed or recommended to subsidize non-government-owned broadband networks to expand service to residential or commercial premises, require that the proposals and recommendations must be limited to areas unserved by broadband, must be technology neutral, and include a competitive bid process that results in the award of the subsidy based on objective and efficient procedures.

Sec. 5. (1) This act does not authorize the Michigan infrastructure council to place any obligations or requirements on providers of telecommunications services, broadband services, or wireless services.

(2) Any network or financial information provided to the Michigan infrastructure council by a provider of telecommunications services, broadband services, or wireless services is exempt from disclosure under section 13(1)(d) of the freedom of information act, 1976 PA 442, MCL 15.243, provided that it is marked as confidential or commercial information. The Michigan infrastructure council shall preserve the confidentiality of this information.

Sec. 6. Funding necessary to support the activities described in this act shall be provided through funds as provided by law.

Enacting section 1. This act does not take effect unless all of the following bills of the 99th Legislature are enacted into law:

(a) House Bill No. 5406.

(b) House Bill No. 5408.

This act is ordered to take immediate effect.

Clerk of the House of Representatives

Secretary of the Senate

Approved .....

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Governor

Sec. 665a. A manufacturer of automated driving technology, an automated driving system, or a motor vehicle is immune from liability that arises out of any modification made to a motor vehicle, an automated motor vehicle, an automated driving system, or automated driving technology by another person without the manufacturer's consent, as provided in section 2949b of the revised judicature act of 1961, 1961 PA 236, MCL 600.2949b. Nothing in this section supersedes or otherwise affects the contractual obligations, if any, between a motor vehicle manufacturer and a manufacturer of automated driving systems or a manufacturer of automated driving technology.

Enacting section 1. Section 663 of the Michigan vehicle code, 1949 PA 300, MCL 257.663, is repealed.

This act is ordered to take immediate effect.

Secretary of the Senate

Clerk of the House of Representatives

Approved .....

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Governor

STATE OF MINNESOTA
Executive Department

Governor Tim Walz

Executive Order 19-18; Rescinding Executive Order 18-04

Establishing the Governor's Council on Connected and Automated Vehicles

I, Tim Walz, Governor of the State of Minnesota, by the authority vested in me by the Constitution and applicable statutes, issue the following Executive Order:

Our State is a global center for innovation and opportunity with a highly educated and entrepreneurial workforce. Minnesota's business and educational institutions are science and technology leaders. As a leader in transformational technology, Minnesota supports public-private collaborations for the research and development of connected and automated vehicles and other intelligent and emerging transportation technologies.

The widespread adoption of connected and automated vehicles will transform the future of transportation, commerce, mobility, workforce, land-use, public health, and safety.

Connected and automated vehicles will dramatically change how public transportation infrastructure is utilized, how traffic regulations are structured, and how public investments in infrastructure are made. The development of connected and automated vehicles could help eliminate transportation barriers. Through collaboration among cities, counties, states, businesses, educational institutions, and nonprofit organizations, Minnesota can realize the promise presented by the widespread adoption of connected and automated vehicles.

For these reasons, I order that:

1. The Governor's Advisory Council on Connected and Automated Vehicles ("Council") is established to study, assess, and prepare for the opportunities and challenges associated with the widespread adoption of connected and automated vehicles and other intelligent and emerging transportation technologies.

2. The Commissioner of Transportation is the Co-Chair of the Council. The Governor will select an individual to serve as the second Co-Chair.

3. In addition to the Co-Chairs, the Council consists of thirteen members appointed by the Governor with relevant experience in the automotive industry, technology, cybersecurity and data privacy, business and finance, transit, higher education,

workforce training, insurance, mobility advocacy, freight, labor, public safety, bicycle and pedestrian advocacy, elder care, or tort liability.

4. The Council also includes the following *ex officio* members:

    a. Commissioner of Administration

    b. Commissioner of Agriculture

    c. Commissioner of Commerce

    d. Commissioner of Employment and Economic Development

    e. Commissioner of Health

    f. Commissioner of Human Services

    g. Commissioner of Iron Range Resources and Rehabilitation

    h. Commissioner of Minnesota IT Services

    i. Commissioner of Minnesota Pollution Control Agency

    j. Commissioner of Public Safety

    k. Commissioner of Revenue

    l. Chair of the Metropolitan Council

    m. Executive Director of the Minnesota Council on Disability

    n. One member of the majority party in the Minnesota Senate

    o. One member of the minority party in the Minnesota Senate

    p. One member of the majority party in the Minnesota House of Representatives

    q. One member of the minority party in the Minnesota House of Representatives

    r. One tribal member designated by the Minnesota Indian Affairs Council

    s. One city representative designated by the League of Minnesota Cities

    t. One county representative designated by the Association of Minnesota Counties

5. The Council has the following duties:

    a. The Council must meet at least four times per year to review developments in connected and automated vehicle technology and intelligent and emerging transportation technology, explore partnership opportunities for the State of Minnesota to remain prepared for the widespread adoption of new technologies, and propose policies to safely test and deploy connected and automated vehicles.

    b. The Council must review the December 2018 Governor's Advisory Council on Connected and Automated Vehicles Executive Report and take actions to implement the recommendations in the report where appropriate.

    c. The Council must consult with communities experiencing transportation barriers that are not represented on the Council.

    d. The Council must prepare a written annual report to the Governor by February 1, 2020 and each year thereafter. The report must include an update on the Council's activities and actions needed to ensure Minnesota is advancing connected and automated vehicles and intelligent transportation and emerging technologies.

    e. The Council must advise and support the Governor, the Department of Transportation, the Department of Public Safety, and other governmental entities to support the testing and deployment of connected and automated vehicles.

6. The Commissioner of Transportation and the Commissioner of Public Safety, in coordination with other relevant state agencies, will:

    a. Establish programs and guidelines for the safe testing and deployment of connected and automated vehicle technologies and other intelligent and emerging transportation technology.

    b. Support safe and effective testing and use of connected and automated vehicles, including driverless technology, in real life situations as necessary to meet industry needs.

    c. Protect individual and industry data as required by the Minnesota Government Data Practices Act.

7. The Commissioner of Transportation will convene agency leadership to form the Interagency Connected and Automated Vehicle Team to implement this Executive Order, including the following:

    a. The Interagency Connected and Automated Vehicle Team consists of the designees of the Commissioners of Administration, Agriculture, Commerce, Employment and Economic Development, Health, Human Services, Iron

Range Resources and Rehabilitation, Minnesota IT Services, Pollution Control, Public Safety, Revenue, and Transportation and the designee of the Chair of the Metropolitan Council.

b. The Interagency Connected and Automated Vehicle Team will ensure interagency coordination and collaboration in developing cross-agency policies and programs to strategically advance and prepare the State of Minnesota for adoption of connected and automated vehicles and other intelligent transportation technologies.

c. The Interagency Connected and Automated Team will provide support and policy advice to the Council.

8. The Department of Transportation will provide staffing and administrative support to the Council.

9. Executive Order 18-04 is rescinded.

This Executive Order is effective fifteen days after publication in the State Register and filing with the Secretary of State. It will remain in effect until rescinded by proper authority or until it expires in accordance with Minnesota Statutes, section 4.035, subdivision 3.

Signed on April 1, 2019.

Tim Walz
Governor

Filed According to Law:

Steve Simon
Secretary of State

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STATE OF MINNESOTA

EXECUTIVE DEPARTMENT

MARK DAYTON
GOVERNOR

Executive Order 18-04

Establishing the Governor's Advisory Council on Connected and Automated Vehicles

I, Mark Dayton, Governor of the State of Minnesota, by virtue of the authority vested in me by the Constitution and applicable statutes, do hereby issue this Executive Order:

Whereas, the State of Minnesota is a global center for innovation and opportunity with a highly educated and entrepreneurial workforce and welcoming business climate;

Whereas, the State of Minnesota is supportive of public-private collaborations for the research and development of the connected and automated vehicles;

Whereas, the widespread adoption of connected and automated vehicles will transform the future of transportation, commerce, mobility, workforce, land-use, and public safety;

Whereas, the widespread adoption of connected and automated vehicles will positively impact public health by reducing injuries, traffic congestion, and air pollution;

Whereas, there are approximately 400 vehicle crash fatalities in Minnesota each year and human error contributes to approximately 94 percent of all serious and fatal crashes;

Whereas, connected and automated vehicles technologies are evolving rapidly, developing new capabilities including the ability to communicate with infrastructure and with other vehicles, and drive safely without a human operator;

Whereas, the development of connected and automated vehicle technologies has the potential to support economic growth, create high-skilled jobs, and promote business opportunities;

Whereas, Minnesota's diverse weather conditions provides significant advantages for the testing of connected and automated vehicles;

Whereas, the widespread adoption of connected and automated vehicles will dramatically change how public transportation infrastructure is utilized, how traffic regulations are structured, and how public investments in infrastructure are made;

Whereas, the development of connected and automated vehicles could help eliminate transportation barriers that leave individuals with disabilities, elderly, and low-income individuals in urban and rural areas disconnected from jobs and educational opportunities; and

Whereas, collaboration and coordination among cities, counties, states, businesses, educational institutions, and nonprofit organizations is needed to capture the opportunity presented by the widespread adoption of connected and automated vehicles.

Now, Therefore, I hereby order that:

1 The Governor's Advisory Council on Connected and Automated Vehicles ("Advisory Council") is established to study, assess, and prepare for the transformation and opportunities associated with the widespread adoption of automated and connected vehicles.

2. The Advisory Council will develop recommendations for changes in state law, rules, and policies to maximize the benefits and prepare for the widespread adoption of automated and connected vehicles.

3. Charles Zelle, the Commissioner of Transportation and Christopher Clark, President of Xcel Energy-Minnesota, North Dakota, and South Dakota shall serve as Co-Chairs of the Advisory Council.

4. The Advisory Council must consist of thirteen other members appointed by the Governor with relevant experience in finance, transit, higher education, workforce training, insurance, automotive industry, advocacy, freight, labor, public safety, technology, or local government.

5. The Advisory Council shall also include the following fourteen ex-officio members:
    a. Commissioner of Agriculture;
    b. Commissioner of Commerce;
    c. Commissioner of Employment and Economic Development;
    d. Commissioner of Health;
    e. Commissioner of Iron Range Resources and Rehabilitation Board;
    f. Commissioner of Minnesota Information Technology Services;
    g. Commissioner of Public Safety;
    h. Commissioner of Revenue;
    i. Chair of the Metropolitan Council;
    j. Executive Director of the Minnesota Council on Disability;
    k. One Member of the Majority Party in the Minnesota Senate;
    l. One Member of the Minority Party in the Minnesota Senate;
    m. One Member of the Majority Party in the Minnesota House of Representatives; and
    n. One Member of the Minority Party in the Minnesota House of Representatives.

6. The Advisory Council has the following duties:
    a. Consult with governmental entities, communities experiencing transportation barriers, transportation stakeholders, the automotive industry, businesses, labor, technology companies, advocacy groups, and educational institutions.
    b. Prepare and submit a report to the Governor, the chairs and minority leads of the Minnesota House and Senate Transportation and Public Safety committees, and the Minnesota Legislature by December 1, 2018 that recommends changes to statutes, rules, and policies in the following areas:
        i. Transportation infrastructure and network;
        ii. Cyber security and data privacy standards;
        iii. Vehicle registration, driver training, licensing, insurance, and traffic regulations;
        iv. Promotion of economic development, business opportunities, and workforce preparation; and
        v. Accessibility and equity for all Minnesotans, with a particular focus on rural communities, elderly Minnesotans, Minnesotans with disabilities, low-income communities, communities of color, and American Indians.

    c. The Advisory Council will provide advice and support to the Governor, the Department of Transportation, the Department of Public Safety, and other governmental entities to support the testing and deployment of connected and automated vehicles.

7. The Commissioners of Transportation and Public Safety in coordination with other relevant state agencies will:
    a. Establish program and guidelines for development, testing, and deployment of connected and automated vehicle technologies;
    b. Support safe and effective testing and use of connected and automated vehicles, at every level of autonomy, including driverless technology, in real life situations as necessary to meet industry needs; and
    c. Protect individual and industry data as classified under the Minnesota Government Data Practices Act.

8. Minnesota Department of Transportation shall convene agency leadership to form the Interagency Connected and Automated Vehicle Team to implement this Executive Order, including the following steps:
    a. The Interagency Connected and Automated Vehicle Team shall consist of the designees of the Departments Agriculture, Commerce, Employment and Economic Development, Health, Iron Range Resources and Rehabilitation Board, Minnesota Information Technology Services, Public Safety, Revenue, Metropolitan Council, and Transportation;
    b. The Interagency Connected and Automated Vehicle Team will ensure interagency coordination and collaboration in developing cross agency policies and programs to strategically advance and prepare the State of Minnesota for adoption of connected and automated vehicles; and
    c. The Interagency Connected and Automated Team will provide operational support to the Advisory Committee.

This Executive Order is effective fifteen days after publication in the State Register and filing with the Secretary of State, and shall remain in effect until rescinded by proper authority or until it expires in accordance with Minnesota Statutes, section 4.035, subdivision 3.

In Testimony Whereof, I have set my hand on this 5th day of March, 2018.

Mark Dayton
Governor

Filed According to Law:

Steve Simon
Secretary of State

CONNECTED VEHICLE TESTING

2015 GENERAL SESSION

STATE OF UTAH

Chief Sponsor: John Knotwell

Senate Sponsor: Aaron Osmond

LONG TITLE

General Description:

This bill modifies the Motor Vehicles Act by authorizing the Department of Transportation to conduct a connected vehicle technology testing program.

Highlighted Provisions:

This bill:

- authorizes the Department of Transportation to conduct a connected vehicle technology testing program outside of an urbanized boundary as defined by the United States Census Bureau;
- requires the Department of Transportation to report the results of the testing program to the Transportation Interim Committee by no later than October 30 in any year that a testing program is conducted; and
- makes technical corrections.

Money Appropriated in this Bill:

None

Other Special Clauses:

None

Utah Code Sections Affected:

AMENDS:

41-6a-711, as last amended by Laws of Utah 2007, Chapter 52

Be it enacted by the Legislature of the state of Utah:

Section 1. Section **41-6a-711** is amended to read:

41-6a-711. Following another vehicle -- Safe distance -- Exceptions.

(1) The operator of a vehicle:

(a) may not follow another vehicle more closely than is reasonable and prudent, having regard for the:

(i) speed of the vehicles;

(ii) traffic upon the highway; and

(iii) condition of the highway; and

(b) shall follow at a distance so that at least two seconds elapse before reaching the location of the vehicle directly in front of the operator's vehicle.

(2) Subsection (1)(b) does not apply to:

(a) funeral processions or to congested traffic conditions resulting in prevailing vehicle speeds of less than 35 miles per hour[~~.~~]; or

(b) a connected vehicle technology testing program that uses networked wireless communication among vehicles, infrastructure, or communication devices that is:

(i) approved by the Department of Transportation in consultation with the Department of Public Safety; and

(ii) conducted outside of an urbanized boundary as defined by the United States Census Bureau.

(3) The Department of Transportation shall report the results of the testing program conducted under Subsection (2)(b) to the Transportation Interim Committee by no later than October 30 of any year that a testing program is conducted.

Enrolled Copy **H.B. 280**

AUTONOMOUS VEHICLE STUDY

2016 GENERAL SESSION

STATE OF UTAH

Chief Sponsor: Robert M. Spendlove

Senate Sponsor: Kevin T. Van Tassell

Cosponsor: John Knotwell

LONG TITLE

General Description:

This bill requires a study related to autonomous vehicles.

Highlighted Provisions:

This bill:

- defines terms;
- requires certain state agencies to study autonomous vehicle technologies and report findings;
- provides authority for agencies to partner with autonomous vehicle technology entities; and
- grants contracting authority.

Money Appropriated in this Bill:

None

Other Special Clauses:

None

Utah Code Sections Affected:

ENACTS:

41-26-101, Utah Code Annotated 1953

41-26-102, Utah Code Annotated 1953

Be it enacted by the Legislature of the state of Utah:

Section 1. Section **41-26-101** is enacted to read:

CHAPTER 26. AUTONOMOUS VEHICLES

41-26-101. Title.

This chapter is known as "Autonomous Vehicles."

Section 2. Section **41-26-102** is enacted to read:

41-26-102. Autonomous motor vehicle study.

(1) As used in this section, "autonomous vehicle" means a motor vehicle equipped with technology that allows the motor vehicle to perform one or more driving functions through vehicle automation, without the direct control of the driver.

(2) Each agency of the state with regulatory authority impacting autonomous vehicle technology testing shall facilitate and encourage the responsible testing and operation of autonomous vehicle technology within the state.

(3) (a) The Department of Public Safety, in consultation with other state agencies, including the Division of Motor Vehicles and the Department of Transportation, shall study, prepare a report, and make recommendations regarding the best practices for regulation of autonomous vehicle technology on Utah highways. The study shall include:

(i) evaluation of standards and best practices suggested by the National Highway Traffic Safety Administration and the American Association of Motor Vehicle Administrators;

(ii) evaluation of appropriate safety features and standards for autonomous vehicles in the unique weather and traffic conditions of Utah;

(iii) evaluation of regulatory strategies and schemes implemented by other states to address autonomous vehicles, including various levels of vehicle automation;

(iv) evaluation of federal standards addressing autonomous vehicles; and

(v) recommendations on how the state should address advances in autonomous vehicle technology through legislation and regulation.

(b) The Department of Public Safety shall provide a written report and present findings of the report, including recommendations, to the Transportation Interim Committee and the Public Utilities and Technology Interim Committee, before December 1, 2016. The Division

of Motor Vehicles, the Department of Transportation, and the Department of Technology Services shall be present for the report to the Transportation Interim Committee.

(4) The Department of Public Safety, the Division of Motor Vehicles, the Department of Transportation, and the Department of Technology Services may partner and contract with a person for the purpose of testing autonomous vehicles within the state.

VEHICLE PLATOONING AMENDMENTS

2018 GENERAL SESSION

STATE OF UTAH

Chief Sponsor: Wayne A. Harper

House Sponsor: Kay J. Christofferson

LONG TITLE

General Description:

This bill modifies provisions of the Traffic Code related to safe following distance.

Highlighted Provisions:

This bill:

- defines "connected platooning system";
- provides an exemption to a minimum following distance requirement for the operator of a vehicle that is part of a connected platooning system; and
- makes technical and conforming changes.

Money Appropriated in this Bill:

None

Other Special Clauses:

None

Utah Code Sections Affected:

AMENDS:

41-6a-711, as last amended by Laws of Utah 2015, Chapters 277 and 412

Be it enacted by the Legislature of the state of Utah:

Section 1. Section **41-6a-711** is amended to read:

41-6a-711. Following another vehicle -- Safe distance -- Exceptions -- Penalty.

(1) As used in this section, "connected platooning system" means a system that uses vehicle-to-vehicle communication to electronically coordinate the speed and braking of a lead

vehicle with the speed and braking of one or more following vehicles.

[~~(1)~~] (2) The operator of a vehicle:

(a) may not follow another vehicle more closely than is reasonable and prudent, having regard for the:

(i) speed of the vehicles;

(ii) traffic upon the highway; and

(iii) condition of the highway; and

(b) shall follow at a distance so that at least two seconds elapse before reaching the location of the vehicle directly in front of the operator's vehicle.

[~~(2)~~] (3) Subsection [~~(1)~~] (2)(b) does not apply to:

(a) funeral processions or to congested traffic conditions resulting in prevailing vehicle speeds of less than 35 miles per hour; or

[~~(b) a connected vehicle technology testing program that uses networked wireless communication among vehicles, infrastructure, or communication devices that is:~~]

[~~(i) approved by the Department of Transportation in consultation with the Department of Public Safety; and~~]

[~~(ii) conducted outside of an urbanized boundary as defined by the United States Census Bureau.~~]

[~~(3) The Department of Transportation shall report the results of the testing program conducted under Subsection (2)(b) to the Transportation Interim Committee by no later than October 30 of any year that a testing program is conducted.~~]

(b) the operator of a vehicle that is:

(i) part of a connected platooning system; and

(ii) not the lead vehicle.

(4) A violation of Subsection [~~(1)~~] (2) is an infraction.

The Capitol Complex is open to the public with some limitations. All meetings are still available virtually online. Please visit the Capitol Information page for details.

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H.B. 101 Autonomous Vehicle Regulations

Bill Text

tatus

Hearings/Debate

Enrolled **H.B. 101**

Printer Friendly

1

AUTONOMOUS VEHICLE REGULATIONS

2

2019 GENERAL SESSION

3

STATE OF UTAH

4

Chief Sponsor: Robert M. Spendlove

5

Sena e S on or David G. Bux on

6

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7 **LONG TITLE**
8 **General Description:**
9 Thi bi amend rovi ion regarding raffic aw , icen ing, and i ing requiremen ,
10 and add rovi ion regarding he o era ion of au onomou vehic e .
11 **Highlighted Provisions:**
12 Thi bi
13 ▸ define erm re a ed o au onomou vehic e ;
14 ▸ a ow he o era ion of a vehic e in he a e by an au oma ed driving y em;
15 ▸ exem a vehic e wi h an engaged au oma ed driving y em from

Bill ponsor:

Rep. Spendlove, Robert M.

Floor ponsor:

Sen. Buxton, David G.

ubstitute ponsor: Rep. Spendlove, Robert M.

Drafting Attorney: Kurt P. Gasser

Fiscal Analyst: Brian Wikle

Bill Tracking

Tracking Page

Bill Text

icen ure;
16 ▸ rovide ro oco in ca e of an acciden invo ving an au onomou vehic e;
17 ▸ require a vehic e equi ed wi h an au oma ed driving y em o be ro er y i ed,
18 regi ered, and in ured;
19 ▸ reem o i ica ubdivi ion from regu a ing au onomou vehic e in addi ion o
20 regu a ion rovided in a e a u e; and
21 ▸ make echnica change .
22 **Money Appropriated in this Bill:**
23 None
24 **Other Special Clauses:**
25 None
26 **Utah Code Sections Affected:**
27 AMENDS
28 **13-51-102**, a enac ed by Law of U ah 2015, Cha er 461

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29 **13-51-103**, a a amended by Law of U ah 2016, Cha er 359
30 **41-1a-102**, a a amended by Law of U ah 2018, Cha er 166 and 424
31 **41-1a-201**, a a amended by Law of U ah 2017, Cha er 149
32 **41-1a-202**, a a amended by Law of U ah 2013, Cha er 463
33 **41-1a-1503**, a enac ed by Law of U ah 2013, Cha er 189
34 **41-6a-102**, a a amended by Law of U ah 2018, Cha er 166 and 205
35 **41-6a-1641**, a a amended by Law of U ah 2015, Cha er 412
36 **53-3-102**, a a amended by Law of U ah 2017, Cha er 297
37 **53-3-104**, a a amended by Law of U ah 2018, Cha er 233 and 415
38 **53-3-202**, a a amended by Law of U ah 2017, Cha er 297
39 ENACTS
40 **41-26-102.1**, U ah Code Anno a ed 1953
41 **41-26-103**, U ah Code Anno a ed 1953
42 **41-26-104**, U ah Code Anno a ed 1953
43 **41-26-105**, U ah Code Anno a ed 1953
44 **41-26-106**, U ah Code Anno a ed 1953
45 **41-26-107**, U ah Code Anno a ed 1953
46 **41-26-108**, U ah Code Anno a ed 1953
47 REPEALS
48 **41-26-102**, a enac ed by Law of U ah 2016, Cha er 212
49

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50 *Be it enacted by the Legislature of the state of Utah:*
51 Sec ion 1. Sec ion **13-51-102** i amended o read
52 **13-51-102. Definitions.**

Intr duced
Enr lled (Currently Displayed)

Other Versions
H.B. 101

Related Documents
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HB0101 c mparis n
Agency Perf N te

Information
Last Action: 29 Mar 2019, G vern r Signed
Last Location: Lieutenant G vern r's ffice f r filing
Effective Date: 14 May 2019
Session Law Chapter: 459

Similar Bills
Techn l gy
M t r Vehicles
Transp rtati n
Registrati n and Registrati n Fees

Sections Affected
13-51-102

(1) "Divi ion" mean he Divi ion of Con umer Pro ec ion wi hin he De ar men of
Commerce.
(2) "Prearranged ride" mean a eriod of ime ha

(a) begin when he ran or a ion ne work driver ha acce ed a a enger' reque
for a ride hrough he ran or a ion ne work com any' of ware a ica ion; and
(b) end when he a enger exi he ran or a ion ne work driver' vehic e.
(3) "Sof ware a ica ion" mean an In erne -connec ed of ware a form, inc uding a
mobi e a ica ion, ha a ran or a ion ne work com any u e o
(a) connec a ran or a ion ne work driver o a a enger; and
(b) roce a enger reque .
(4) "Tran or a ion ne work com any" mean an en i y ha
(a) u e a of ware a ica ion o connec a a enger o a ran or a ion ne work
driver roviding ran or a ion ne work ervice ;
(b) i no
(i) a axicab, a defined in Sec ion 53-3-102; or
(ii) a mo or carrier, a defined in Sec ion 72-9-102; and
(c) exce in cer ain ca e invo ving a mo or vehic e wi h a eve four or five au oma ed
driving y em, a defined in Sec ion 41-26-102.1, doe no own, con ro , o era e, or manage
he vehic e u ed o rovide he ran or a ion ne work ervice .
(5) "Tran or a ion ne work driver" mean [~~an individua who~~]
(a) an individua who
[~~(a)~~] (i) ay a fee o a ran or a ion ne work com any, and, in exchange, receive a
connec ion o a o en ia a enger from he ran or a ion ne work com any;
[~~(b)~~] (ii) o era e a mo or vehic e ha
[~~(i)~~] (A) he individua own , ea e , or i au horized o u e; and
[~~(ii)~~] (B) he individua u e o rovide ran or a ion ne work ervice ; and
[~~(c)~~] (iii) receive , in exchange for roviding a a enger a ride, com en a ion ha
exceed he individua ' co o rovide he ride[~~.~~]; or
(b) a eve four or five au oma ed driving y em, a defined in Sec ion 41-26-102.1,
when he au oma ed driving y em i o era ing he vehic e and u ed o rovide a a enger a
ride in exchange for com en a ion.
(6) "Tran or a ion ne work ervice " mean , for a ran or a ion ne work driver
roviding ervice hrough a ran or a ion ne work com any
(a) roviding a rearranged ride; or
(b) being engaged in a wai ing eriod.
(7) "Wai ing eriod" mean a eriod of ime when

13-51-1 3
41-1a-1 2
41-1a-2 1
41-1a-2 2
41-1a-15 3
41-6a-1 2
41-6a-1641
41-26-1 2
53-3-1 2
53-3-1 4
53-3-2 2

(a) a an o a ion ne wo k d ive i ogged in o a an o a ion ne wo k com any'
of wa e a ica ion; and
(b) he an o a ion ne wo k d ive i no engaged in a ea anged ide.

Sec ion 2. Sec ion **13-51-103** i amended o ead

13-51-103. Exemptions -- Transportation network company and transportation network driver.

(1) A an o a ion ne wo k com any o a an o a ion ne wo k d ive i no ubjec o he equi emen a icab e o
(a) a mo o ca ie , unde Ti e 72, Cha e 9, Mo o Ca ie Safe y Ac ;
(b) a common ca ie , unde Ti e 59, Cha e 12, Sa e and U e Tax Ac ; o
(c) a axicab, unde Ti e 53, Cha e 3, Unifo m D ive Licen e Ac .
(2) A an o a ion ne wo k d ive i
(a) (i) an inde enden con ac o of a an o a ion ne wo k com any; and
[~~(b)~~] (ii) no an em oyee of a an o a ion ne wo k com any[~~.~~]; o
(b) fo a mo o vehic e wi h a eve fou o five au oma ed d iving y em a defined in Sec ion 41-26-102.1, in d ive e o e a ion, an au oma ed d iving y em if di a ched
(i) a he di ec ion of, on beha f of, o a an agen of a an o a ion ne wo k com any;
o
(ii) a he di ec ion of, on beha f of, o a an agen of a hi d a y u uan o an ag eemen be ween he hi d a y and a an o a ion ne wo k com any, o e a ed on beha f of and a an agen of he an o a ion ne wo k com any.

Sec ion 3. Sec ion **41-1a-102** i amended o ead

41-1a-102. Definitions.

A u ed in hi cha e
(1) "Ac ua mi e " mean he ac ua di ance a vehic e ha ave ed whi e in o e a ion.
(2) "Ac ua weigh " mean he ac ua un aden weigh of a vehic e o combina ion of vehic e a o e a ed and ce ified o by a weighma e .
(3) "A - e ain y e I vehic e" mean he ame a ha e m i defined in Sec ion 41-22-2.
(4) "A - e ain y e II vehic e" mean he ame a ha e m i defined in Sec ion 41-22-2.
(5) "A - e ain y e III vehic e" mean he ame a ha e m i defined in Sec ion 41-22-2.
(6) "A e na ive fue vehic e" mean
(a) an e ec ic mo o vehic e;

(b) a h brid e ec ric mo or vehic e;
(c) a ug-in h brid e ec ric mo or vehic e; or
(d) a mo or vehic e owered b a fue o her han
(i) mo or fue ;
(ii) die e fue ;
(iii) na ura ga ; or
(iv) ro ane.
(7) "Ama eur radio o era or" mean an er on icen ed b he Federa
Communica ion Commi ion o engage in riva e and ex erimen a wo-wa radio o era ion
on he ama eur band radio frequencie .
(8) "Au oc c e" mean he ame a ha erm i defined in Sec ion 53-3-102.
(9) "Au oma ed driving em" mean he ame a ha erm i defined in Sec ion
41-26-102.1.

[~~(9)~~] (10) "Branded i e" mean a i e cer ifica e ha i abe ed
(a) rebui and re ored o o era ion;
(b) f ooded and re ored o o era ion; or
(c) no re ored o o era ion.
[~~(10)~~] (11) "Cam er" mean an ruc ure de igned, u ed, and main ained rimari o
be moun ed on or affixed o a mo or vehic e ha con ain a f oor and i de igned o rovide a
mobi e dwe ing, ee ing ace, commercia ace, or faci i ie for human habi a ion or for
cam ing.
[~~(11)~~] (12) "Cer ifica e of i e" mean a documen i ued b a juri dic ion o e ab i h
a record of owner hi be ween an iden ified owner and he de cribed vehic e, ve e , or
ou board mo or.
[~~(12)~~] (13) "Cer ified ca e weigh icke " mean a weigh icke ha ha been i ued b
a weighma er.
[~~(13)~~] (14) "Commercia vehic e" mean a mo or vehic e, rai er, or emi rai er u ed or
main ained for he ran or a ion of er on or ro er ha o era e
(a) a a carrier for hire, com en a ion, or rofi ; or
(b) a a carrier o ran or he vehic e owner' good or ro er in fur herance of he
owner' commercia en er ri e.
[~~(14)~~] (15) "Commi ion" mean he S a e Tax Commi ion.
[~~(15)~~] (16) "Con umer rice index" mean he ame a ha erm i defined in Sec ion
59-13-102.
[~~(16)~~] (17) "Dea er" mean a er on engaged or icen ed o engage in he bu ine of
bu ing, e ing, or exchanging new or u ed vehic e , ve e , or ou board mo or ei her ou righ
or on condi iona a e, bai men , ea e, cha e mor gage, or o herwi e or

who ha an
161 e ab i he ace of bu ine for he a e, ea e, ra e, or i ay of vehic e , ve e , or
162 ou boar mo or .
163 [~~(17)~~] (18) "Die e fue " mean he ame a ha erm i efine in Sec ion 59-13-102.

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164 [~~(18)~~] (19) "Divi ion" mean he Mo or Vehic e Divi ion of he commi ion, crea e in
165 Sec ion 41-1a-106.
166 (20) "Dynamic riving a k" mean he ame a ha erm i efine in Sec ion
167 41-26-102.1.
168 [~~(19)~~] (21) "E ec ric mo or vehic e" mean a mo or vehic e ha i owere o e y by an
169 e ec ric mo or rawing curren from a rechargeab e energy orage y em.
170 [~~(20)~~] (22) "E en ia ar " mean a in egra an bo y ar of a vehic e of a y e
171 require o be regi ere in hi a e, he remova , a era ion, or ub i u ion of which wou
172 en o concea he i en i y of he vehic e or ub an ia y a er i a earance, mo e , y e, or
173 mo e of o era ion.
174 [~~(21)~~] (23) "Farm rac or" mean every mo or vehic e e igne an u e rimari y a a
175 farm im emen for rawing ow , mowing machine , an o her im emen of hu ban ry.
176 [~~(22)~~] (24) (a) "Farm ruck" mean a ruck u e by he owner or o era or of a farm
177 o e y for he owner' or o era or' own u e in he ran or a ion of
178 (i) farm ro uc , inc u ing ive ock an i ro uc , ou ry an i ro uc ,
179 f oricu ura an hor icu ura ro uc ;
180 (ii) farm u ie , inc u ing i e, fence, an every o her hing or commo i y u e in
181 agricu ura , f oricu ura , hor icu ura , ive ock, an ou ry ro uc ion; an
182 (iii) ive ock, ou ry, an o her anima an hing u e for bree ing, fee ing, or
183 o her ur o e connec e wi h he o era ion of a farm.
184 (b) "Farm ruck" oe no inc u e he o era ion of ruck by commercia roce or of
185 agricu ura ro uc .
186 [~~(23)~~] (25) "F ee " mean one or more commercia vehic e .
187 [~~(24)~~] (26) "Foreign vehic e" mean a vehic e of a y e require o be regi ere ,
188 brough in o hi a e from ano her a e, erri ory, or coun ry o her han in he or inary cour e
189 of bu ine by or hrough a manufac urer or ea er, an no regi ere in hi a e.
190 [~~(25)~~] (27) "Gro a en weigh " mean he ac ua weigh of a vehic e or combina ion

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of vehic e , equi e for o era ion, o which ha be a e he maximum oa o be carrie .

[~~(26)~~] (28) "Highway" or " ree " mean he en ire wi h be ween ro er y ine of every way or ace of wha ever na ure when any ar of i i o en o he ub ic, a a ma er of righ , for ur o e of vehicu ar raffic.

[~~(27)~~] (29) "Hybri e ec ric mo or vehic e" mean a mo or vehic e ha raw ro u ion energy from onboar ource of ore energy ha are bo h (a) an in erna combu ion engine or hea engine u ing con umab e fue ; an

(b) a rechargeab e energy orage y em where energy for he orage y em come o e y from ource onboar he vehic e.

[~~(28)~~] (30) (a) "I en ifica ion number" mean he i en ifying number a igne by he manufac urer or by he ivi ion for he ur o e of i en ifying he vehic e, ve e , or ou boar mo or.

(b) "I en ifica ion number" inc u e a vehic e i en ifica ion number, a e a igne i en ifica ion number, hu i en ifica ion number, an mo or eria number.

[~~(29)~~] (31) "Im emen of hu ban ry" mean every vehic e e igne or a a e an u e exc u ive y for an agricu ura o era ion an on y inci en a y o era e or move u on he highway .

[~~(30)~~] (32) (a) "In- a e mi e " mean he o a number of mi e o era e in hi a e uring he rece ing year by f ee ower uni .

(b) If f ee are com o e en ire y of rai er or emi rai er , "in- a e mi e " mean he o a number of mi e ha ho e vehic e were owe on U ah highway uring he rece ing year.

[~~(31)~~] (33) "In er a e vehic e" mean any commercia vehic e o era e in more han one a e, rovince, erri ory, or o e ion of he Uni e S a e or foreign coun ry.

[~~(32)~~] (34) "Juri ic ion" mean a a e, i ric , rovince, o i ica ub ivi ion, erri ory, or o e ion of he Uni e S a e or any foreign coun ry.

[~~(33)~~] (35) "Lienho er" mean a er on wi h a ecuri y in ere in ar icu ar ro er y.

[~~(34)~~] (36) "Manufac ure home" mean a ran or ab e fac ory bui hou ing uni con ruc e on or af er June 15, 1976, accor ing o he Fe era Home Con ruc ion an Safe y S an ar Ac of 1974 (HUD Co e), in one or more ec ion , which, in he rave ing mo e, i eigh bo y fee or more in wi h or 40 bo y fee or more in eng h, or when erec e on i e, i

400 or more quare ee , and which i bui on a ermanen cha i and de igned o be u ed a a dwe ing wi h or wi hou a ermanen ounda ion when connec ed o he required u i i ie , and inc ude he umbing, hea ing, air-condi ioning, and e ec rica y em .

[~~(35)~~] (37) "Manu ac urer" mean a er on engaged in he bu ine o con ruc ing, manu ac uring, a emb ing, roducing, or im or ing new or unu ed vehic e , ve e , or ou board mo or or he ur o e o a e or rade.

[~~(36)~~] (38) "Mobi e home" mean a ran or ab e ac ory bui hou ing uni bui rior o June 15, 1976, in accordance wi h a a e mobi e home code which exi ed rior o he Federa Manu ac ured Hou ing and Sa e y S andard Ac (HUD Code).

[~~(37)~~] (39) "Mo or ue " mean he ame a ha erm i de ined in Sec ion 59-13-102.

[~~(38)~~] (40) (a) "Mo or vehic e" mean a e - ro e ed vehic e in ended rimari y or u e and o era ion on he highway .

(b) "Mo or vehic e" doe no inc ude an o -highway vehic e.

[~~(39)~~] (41) "Mo orboa " mean he ame a ha erm i de ined in Sec ion 73-18-2.

[~~(40)~~] (42) "Mo orcyc e" mean

(a) a mo or vehic e having a add e or he u e o he rider and de igned o rave on no more han hree whee in con ac wi h he ground; or

(b) an au ocyc e.

[~~(41)~~] (43) "Na ura ga " mean a ue o which he rimary con i uen i me hane.

[~~(42)~~] (44) (a) "Nonre iden " mean a er on who i no a re iden o hi a e a de ined by Sec ion 41-1a-202, and who doe no engage in in ra a e bu ine wi hin hi a e and doe no o era e in ha

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bu ine any mo or vehic e, rai er, or emi rai er in hi a e or who, even hough engaging in in er a e commerce, main ain any vehic e in hi a e a he home a ion o ha vehic e i con idered a re iden o hi a e, in o ar a ha vehic e i concerned in admini ering hi cha er.

[~~(43)~~] (45) "Odome er" mean a device or mea uring and recording he ac ua di ance a vehic e rave whi e in o era ion, bu doe no inc ude any auxi iary odome er de igned o be eriodica y re e .

[~~(44)~~] (46) "O -highway im emen o hu bandry" mean he ame a ha erm i

defi ed i Sec io 41-22-2.

[~~(45)~~] (47) "Off-highway vehic e" mea he ame a ha erm i defi ed i Sec io 41-22-2.

[~~(46)~~] (48) (a) "O era e" mea [~~o drive or be i ac ua hy ica co ro of a vehic e or~~]

(i) o aviga e a ve e [~~,~~]; or

(ii) co ec ive y, he ac ivi ie erformed i order o erform he e ire dy amic drivi g a k for a give mo or vehic e by

(A) a huma driver a defi ed i Sec io 41-26-102.1; or

(B) a e gaged au oma ed drivi g y em.

(b) "O era e" i c ude e i g of a au oma ed drivi g y em.

[~~(47)~~] (49) "Ou board mo or" mea a de achab e e f-co ai ed ro u io u i , exc udi g fue u y, u ed o ro e a ve e .

[~~(48)~~] (50) (a) "Ow er" mea a er o , o her ha a ie ho der, ho di g i e o a vehic e, ve e , or ou board mo or whe her or o he vehic e, ve e , or ou board mo or i ubjec o a ecuri y i ere .

(b) If a vehic e i he ubjec of a agreeme for he co di io a a e or i a me a e or mor gage of he vehic e wi h he righ of urcha e u o erforma ce of he co di io a ed i he agreeme a d wi h a immedia e righ of o e io ve ed i he co di io a

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ve dee or mor gagor, or if he vehic e i he ubjec of a ecuri y agreeme , he he co di io a ve dee, mor gagor, or deb or i co idered he ow er for he ur o e of hi cha er.

(c) If a vehic e i he ubjec of a agreeme o ea e, he e or i co idered he ow er u i he e ee exerci e he e ee' o io o urcha e he vehic e.

[~~(49)~~] (51) "Park mode recrea io a vehic e" mea a u i ha

(a) i de ig ed a d marke ed a em orary ivi g quar er for recrea io a , cam i g, rave , or ea o a u e;

(b) i o erma e y affixed o rea ro er y for u e a a erma e dwe i g;

(c) require a ecia highway moveme ermi for ra i ; a d

(d) i bui o a i g e cha i mou ed o whee wi h a gro rai er area o exceedi g 400 quare fee i he e u mode.

[~~(50)~~] (52) "Per o a ized ice e a e" mea a ice e a e ha ha di ayed o i a combi a io of e er , umber , or bo h a reque ed by he ow er of he vehic e a d a ig ed o he vehic e by he divi io .

287 [~~(1)~~] (3) (a) "Picku ruck" mean a wo-ax e mo or vehic e wi h mo ive ower
288 manufac ured, remanufac ured, or ma eria y a ered o rovide an o en cargo area.
289 (b) "Picku ruck" inc ude mo or vehic e wi h he o en cargo area covered wi h a
290 cam er, cam er he , ar , removab e o , or imi ar ruc ure.
291 [~~(2)~~] (4) "P ug-in hybrid e ec ric mo or vehic e" mean a hybrid e ec ric mo or
292 vehic e ha ha he ca abi i y o charge he ba ery or ba erie u ed for vehic e ro u ion
293 from an off-vehic e e ec ric ource, uch ha he off-vehic e ource canno be connec ed o he
294 vehic e whi e he vehic e i in mo ion.
29 [~~(3)~~] (__) "Pneuma ic ire" mean every ire in which com re ed air i de igned o
296 u or he oad.
297 [~~(4)~~] (6) "Preceding year" mean a eriod of 12 con ecu ive mon h fixed by he
298 divi ion ha i wi hin 16 mon h immedia e y receding he commencemen of he regi ra ion

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299 or icen e year in which ro or iona regi ra ion i ough . The divi ion in fixing he eriod
300 ha conform i o he erm , condi ion , and requiremen of any a icab e agreemen or
301 arrangemen for he ro or iona regi ra ion of vehic e .
302 [~~(5)~~] (7) "Pub ic garage" mean every bui ding or o her ace where vehic e or
303 ve e are ke and ored and where a charge i made for he orage and kee ing of vehic e
304 and ve e .
30 [~~(6)~~] (8) "Recei of urrender of owner hi documen " mean he recei of
306 urrender of owner hi documen de cribed in Sec ion 41-1a- 03.
307 [~~(7)~~] (9) "Recon ruc ed vehic e" mean every vehic e of a y e required o be
308 regi ered in hi a e ha i ma eria y a ered from i origina con ruc ion by he remova ,
309 addi ion, or ub i u ion of e en ia ar , new or u ed.
310 [~~(8)~~] (60) "Recrea iona vehic e" mean he ame a ha erm i defined in Sec ion
311 13-14-102.
312 [~~(9)~~] (61) "Regi ra ion" mean a documen i ued by a juri dic ion ha a ow
313 o era ion of a vehic e or ve e on he highway or wa er of hi a e for he ime eriod for
314 which he regi ra ion i va id and ha i evidence of com iance wi h he regi ra ion
31 requiremen of he juri dic ion.
316 [~~(60)~~] (62) (a) "Regi ra ion year" mean a 12 con ecu ive mon h eriod commencing
317 wi h he com e ion of a a icab e regi ra ion cri eria.

(b) or admini ra ion of a mu i a e agreemen for ro or iona regi ra ion he divi ion may re cribe a differen 12-mon h eriod.

[~~(61)~~] (63) "Re air or re acemen " mean he re ora ion of vehic e , ve e , or ou board mo or o a ound working condi ion by ub i u ing any ino era ive ar of he vehic e, ve e , or ou board mo or, or by correc ing he ino era ive ar .

[~~(62)~~] (64) "Re ica vehic e" mean

(a) a ree rod ha mee he requiremen under Sub ec ion 41-21-1(3)(a)(i)(B); or

(b) a cu om vehic e ha mee he requiremen under Sub ec ion 41-6a-1507(1)(a)(i)(B).

[~~(63)~~] (65) "Road rac or" mean every mo or vehic e de igned and u ed for drawing o her vehic e and con ruc ed o i doe no carry any oad ei her inde enden y or any ar of he weigh of a vehic e or oad ha i drawn.

[~~(64)~~] (66) "Sai boa " mean he ame a ha erm i defined in Sec ion 73-18-2.

[~~(65)~~] (67) "Securi y in ere " mean an in ere ha i re erved or crea ed by a ecuri y agreemen o ecure he aymen or erformance of an ob iga ion and ha i va id again hird ar ie .

[~~(66)~~] (68) "Semi rai er" mean every vehic e wi hou mo ive ower de igned for carrying er on or ro er y and for being drawn by a mo or vehic e and con ruc ed o ha ome ar of i weigh and i oad re or i carried by ano her vehic e.

[~~(67)~~] (69) "S ecia grou icen e a e" mean a y e of icen e a e de igned for a ar icu ar grou of eo e or a icen e a e au horized and i ued by he divi ion in accordance wi h Sec ion 41-1a-418.

[~~(68)~~] (70) (a) "S ecia in ere vehic e" mean a vehic e u ed for genera ran or a ion ur o e and ha i

(i) 20 year or o der from he curren year; or

(ii) a make or mode of mo or vehic e recognized by he divi ion direc or a having unique in ere or hi oric va ue.

(b) In making a de ermina ion under Sub ec ion [~~(68)~~] (70)(a), he divi ion direc or ha give ecia con idera ion o

(i) a make of mo or vehic e ha i no onger manufac ured;

(ii) a make or mode of mo or vehic e roduced in imi ed or oken quan i ie ;

(iii) a make or mode of mo or vehic e roduced a an ex erimen a vehic e or one de igned exc u ive y for educa iona ur o e or mu eum di ay; or

(iv) a mo o vehic e of any age o make ha ha no been ub an ia y a e ed o
modified f om o igina ecifica ion of he manufac u e and becau e of i ignificance i

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being co ec ed, e e ved, e o ed, main ained, o o e a ed by a co ec o o hobbyi a a
ei u e u ui .
[~~(69)~~] (71) (a) "S ecia mobi e equi men " mean eve y vehic e
(i) no de igned o u ed ima i y fo he an o a ion of e on o o e y;
(ii) no de igned o o e a e in affic; and
(iii) on y inciden a y o e a ed o moved ove he highway .
(b) "S ecia mobi e equi men " inc ude
(i) fa m ac o ;
(ii) off- oad mo o ized con uc ion o main enance equi men inc uding backhoe ,
bu doze , com ac o , g ade , oade , oad o e , ac o , and enche ; and
(iii) di ch-digging a a a u .
(c) "S ecia mobi e equi men " doe no inc ude a comme cia vehic e a defined
unde Sec ion 72-9-102.
[~~(70)~~] (72) "S ecia y con uc ed vehic e" mean eve y vehic e of a y e equi ed o be
egi e ed in hi a e, no o igina y con uc ed unde a di inc ive name, make, mode , o
y e by a gene a y ecognized manufac u e of vehic e , and no ma e ia y a e ed f om i
o igina con uc ion.
[~~(71)~~] (73) "Ti e" mean he igh o o owne hi of a vehic e, ve e , o ou boa d
mo o .
[~~(72)~~] (74) (a) "To a f ee mi e " mean he o a numbe of mi e o e a ed in a
ju i dic ion du ing he eceding yea by owe uni .
(b) If f ee a e com o ed en i e y of ai e o emi ai e , " o a f ee mi e " mean
he numbe of mi e ha ho e vehic e we e owed on he highway of a ju i dic ion du ing
he eceding yea .
[~~(73)~~] (75) "T ai e " mean a vehic e wi hou mo ive owe de igned fo ca ying
e on o o e y and fo being d awn by a mo o vehic e and con uc ed o ha no a of
i weigh e u on he owing vehic e.

[~~(74)~~] (76) "T an fe ee" mean a e on o whom he owne hi of o e y i
conveyed by a e, gif , o any o he mean exce by he c ea ion of a ecu i y in e e .
[~~(75)~~] (77) "T an fe o " mean a e on who an fe he e on' owne hi in
o e y by a e, gif , o any o he mean exce by c ea ion of a ecu i y

in ere .

~~(76)~~] (78) "Trave rai er," "cam ing rai er," or "fif h whee rai er" mean a or ab e

vehic e wi hou mo ive ower, de igned a a em orary dwe ing for rave , recrea iona , or

vaca ion u e ha doe no require a ecia highway movemen ermi when drawn by a

e f- ro e ed mo or vehic e.

~~(77)~~] (79) "Truck rac or" mean a mo or vehic e de igned and u ed rimari y for

drawing o her vehic e and no con ruc ed o carry a oad o her han a ar of he weigh of he

vehic e and oad ha i drawn.

~~(78)~~] (80) "Vehic e" inc ude a mo or vehic e, rai er, emi rai er, off-highway vehic e,

cam er, ark mode recrea iona vehic e, manufac ured home, and mobi e home.

~~(79)~~] (81) "Ve e " mean he ame a ha erm i defined in Sec ion 73-18-2.

~~(80)~~] (82) "Vin age vehic e" mean he ame a ha erm i defined in Sec ion

41-21-1.

~~(81)~~] (83) "Wa er of hi a e" mean he ame a ha erm i defined in Sec ion

73-18-2.

~~(82)~~] (84) "Weighma er" mean a er on, a ocia ion of er on , or cor ora ion

ermi ed o weigh vehic e under hi cha er.

Sec ion 4. Sec ion **41-1a-201** i amended o read

41-1a-201. Function of registration -- Registration required -- Penalty.

(1) Un e exem ed, a er on or au oma ed driving y em may no o era e and an

owner may no engage an au oma ed driving y em, give ano her er on ermi ion o engage

an au oma ed driving y em, or give ano her er on ermi ion o o era e a mo or vehic e,

combina ion of vehic e , rai er, emi rai er, vin age vehic e, off-highway vehic e, ve e , or

ark mode recrea iona vehic e in hi a e un e i ha been regi ered in accordance wi h

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hi cha er, Ti e 41, Cha er 22, Off-Highway Vehic e , or Ti e 73, Cha er 18, S a e

Boa ing Ac .

(2) Subjec o Sub ec ion 53-8-209(3), a vio a ion of hi ec ion i an infrac ion.

Sec ion 5. Sec ion **41-1a-202** i amended o read

41-1a-202. Definitions -- Vehicles exempt from registration -- Registration of

vehicles after establishing residency.

(1) In hi ec ion

(a) " omici e" mean he ace
(i) where an individua ha a fixed ermanen home and rinci a e ab i hmen ;
(ii) o which he individua if ab en , in end o re urn; and
(iii) in which he individua and hi fami y vo un ari y re ide, no for a ecia or
em orary ur o e, bu wi h he in en ion of making a ermanen home.
(b) (i) "Re iden " mean any of he fo owing
(A) an individua who
(I) ha e ab i hed a domici e in hi a e;
(II) regard e of domici e, remain in hi a e for an aggrega e eriod of ix mon h
or more during any ca endar year;
(III) engage in a rade, rofe ion, or occu a ion in hi a e or who acce
em oymen in o her han ea ona work in hi a e and who doe no commu e in o he a e;
(IV) dec are him e f o be a re iden of hi a e for he ur o e of ob aining a driver
icen e or mo or vehic e regi ra ion; or
(V) dec are him e f a re iden of U ah o ob ain rivi ege no ordinari y ex ended o
nonre iden , inc uding going o choo , or acing chi dren in choo wi hou aying
nonre iden ui ion or fee ; or
(B) any individua , ar ner hi , imi ed iabi i y com any, firm, cor ora ion,
a ocia ion, or o her en i y ha
(I) main ain a main office, branch office, or warehou e faci i y in hi a e and ha

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ba e and o era e a mo or vehic e in hi a e; or
(II) o era e a mo or vehic e in in ra a e ran or a ion for o her han ea ona work.
(ii) "Re iden " doe no inc ude any of he fo owing
(A) a member of he mi i ary em orari y a ioned in U ah;
(B) an ou -of- a e uden , a c a ified by he in i u ion of higher educa ion, enro ed
wi h he equiva en of even or more quar er hour , regard e of whe her he uden engage
in a rade, rofe ion, or occu a ion in hi a e or acce em oymen in hi a e; and
(C) an individua domici ed in ano her a e or a foreign coun ry ha
(I) i engaged in ub ic, chari ab e, educa iona , or re igiou ervice for a governmen
agency or an organiza ion ha qua ifie for ax-exem a u under In erna Revenue Code
Sec ion 501(c)(3);
(II) i no com en a ed for ervice rendered o her han ex en e reimbur emen ; and
(III) i em orari y in U ah for a eriod no o exceed 24 mon h .
(iii) No wi h anding Sub ec ion (1)(b)(i) and (ii), "re iden " inc ude he owner of a
vehic e equi ed wi h an au oma ed driving y em a defined in Sec ion

41-26-102.1 i he

449 vehic e i hy ica y re en in he a e or more han 30 con ecu ive day in a ca endar year.
450 (2) Regi ra ion under hi cha er i no required or any
451 (a) vehic e regi ered in ano her a e and owned by a nonre iden o he a e or
452 o era ing under a em orary regi ra ion ermi i ued by he divi ion or a dea er au horized by
453 hi cha er, driven or moved u on a highway in con ormance wi h he rovi ion o hi
454 cha er re a ing o manu ac urer , ran or er , dea er , ien ho der , or in er a e vehic e ;
455 (b) vehic e driven or moved u on a highway on y or he ur o e o cro ing he
456 highway rom one ro er y o ano her;
457 (c) im emen o hu bandry, whe her o a y e o herwi e ubjec o regi ra ion or no ,
458 ha i on y inciden a y o era ed or moved u on a highway;
459 (d) ecia mobi e equi men ;
460 (e) vehic e owned or ea ed by he edera governmen ;

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461 ( ) mo or vehic e no de igned, u ed, or main ained or he ran or a ion o a enger
462 or hire or or he ran or a ion o ro er y i he mo or vehic e i regi ered in ano her a e
463 and i owned and o era ed by a nonre iden o hi a e;
464 (g) vehic e or combina ion o vehic e de igned, u ed, or main ained or he
465 ran or a ion o er on or hire or or he ran or a ion o ro er y i he vehic e or
466 combina ion o vehic e i regi ered in ano her a e and i owned and o era ed by a
467 nonre iden o hi a e and i he vehic e or combina ion o vehic e ha a gro aden weigh
468 o 26,000 ound or e ;
469 (h) rai er o 750 ound or e un aden weigh and no de igned, u ed, and main ained
470 or hire or he ran or a ion o ro er y or er on;
471 (i) manu ac ured home or mobi e home;
472 (j) o -highway vehic e curren y regi ered under Sec ion 41-22-3 i he o -highway
473 vehic e i
474 (i) being owed;
475 (ii) o era ed on a ree or highway de igna ed a o en o o -highway vehic e u e; or
476 (iii) o era ed in he manner re cribed in Sub ec ion 41-22-10.3(1) hrough (3);
477 (k) o -highway im emen o hu bandry o era ed in he manner re cribed in
478 Sub ec ion 41-22-5.5(3) hrough (5);
479 ( ) modu ar and rebui home con orming o he uni orm bui ding code and re en y
480 regu a ed by he Uni ed S a e De ar men o Hou ing and Urban

Deve o men ha a e no
481 con uc ed on a e manen cha i ;
482 (m) e ec ic a i ed bicyc e defined unde Sec ion 41-6a-102;
483 (n) mo o a i ed coo e defined unde Sec ion 41-6a-102; o
484 (o) e ec ic e ona a i ive mobi i y device defined unde Sec ion 41-6a-102.
485 (3) Un e o he wi e exem ed unde Sub ec ion (2), egi a ion unde hi cha e i
486 equi ed fo any mo o vehic e, combina ion of vehic e , ai e , emi ai e , o vin age vehic e
487 wi hin 60 day of he owne e ab i hing e idency in hi a e.

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488 (4) A mo o vehic e ha i egi e ed unde Sec ion 41-3-306 i exem f om he
489 egi a ion equi emen of hi a fo he ime e iod ha he egi a ion unde Sec ion
490 41-3-306 i va id.
491 (5) A vehic e ha ha been i ued a non e ai ab e ce ifica e may no be egi e ed
492 unde hi cha e .
493 Sec ion 6. Sec ion **41-1a-1503** i amended o ead
494 **41-1a-1503. Event data recorders -- Retrieval or disclosure of event data.**
495 (1) (a) Even da a ha i eco ded on an even da a eco de
496 (i) i iva e;
497 (ii) i he e ona info ma ion of he mo o vehic e' owne ; and
498 (iii) exce a ovided in Sub ec ion (2), may no be e ieved by a e on who i no
499 he owne of he mo o vehic e.
500 (b) If a mo o vehic e i owned by mo e han one e on, on y one owne i equi ed o
501 con en o he e ieva o u e of he da a f om a mo o vehic e even da a eco de .
502 (2) Even da a ha i eco ded on an even da a eco de may be e ieved, ob ained, o
503 u ed by a e on who i no he owne of he mo o vehic e in he fo owing ci cum ance
504 (a) he owne of he mo o vehic e o he owne ' agen ha con en ed o he e ieva of
505 he da a e a ing o an acciden ;
506 (b) he da a i e ieved by a mo o vehic e dea e , mo o vehic e manufac u e , o by an
507 au omo ive echnician o diagno e, e vice, o e ai he mo o vehic e a he eque of he
508 owne o he owne ' agen ;
509 (c) he da a i ubjec o di cove y in a c imina o ecu ion o u uan o he u e of
510 civi ocedu e in a c aim a i ing ou of a mo o vehic e acciden ;
511 (d) a cou o admini a ive agency having ju i dic ion o de he da a o be e ieved;
512 (e) a eace office e ieve he da a u uan o a cou o de a a of an inve iga ion

513 of a u ec ed vio a io of a aw ha ha cau ed, or co ribu ed o he
cau e of, a accide
514 re u i g i damage of ro er y or i jury o a er o ; [~~or~~]

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515 (f) o faci i a e or de ermi e he eed for emerge cy medica care for
he driver or
516 a e ger of a mo or vehic e ha i i vo ved i a mo or vehic e cra h or
o her emerge cy,
517 i c udi g he re rieva of da a from a com a y ha rovide ub cri io
ervice o he ow er
518 of a mo or vehic e for i -vehic e afe y a d ecuri y commu ica io [-]; or
519 (g) for ur o e of im rovi g mo or vehic e afe y, ecuri y, or raffic
ma ageme ,
520 i c udi g medica re earch o he huma body' reac io o mo or vehic e
cra he , a o g a
521 he ide i y of he ow er, a e ger, or huma driver i o di c o ed i
co ec io wi h he
522 re rieved da a.
523 (3) Exce a rovided i Sub ec io (4), a er o who ha re rieved,
ob ai ed, or u ed
524 eve da a u der Sub ec io (2) may o re ea e eve da a ha i
recorded o a eve da a
525 recorder.
526 (4) A er o may re ea e eve da a ha i recorded o a eve da a
recorder i he
527 fo owi g circum a ce
528 (a) he ow er of he mo or vehic e or he ow er' age ha co e ed
o he re ea e of
529 he da a;
530 (b) he da a i ubjec o di covery i a crimi a ro ecu io or
ur ua o he ru e of
531 civi rocedure i a c aim ari i g ou of a mo or vehic e accide ;
532 (c) he da a i re ea ed ur ua o a cour order a ar of a
i ve iga io of a
533 u ec ed vio a io of a aw ha ha cau ed, or co ribu ed o he cau e
of, a accide
534 re u i g i damage of ro er y or i jury o a er o ; or
535 (d) if he ide i y of he ow er or driver i o di c o ed[~~; he da a i
re ea ed o a mo or~~
536 ~~vehic e afe y a d medica re earch e i y or da a roce or i order o
adva ce mo or vehic e~~
537 ~~afe y, ecuri y, or raffic ma ageme ~~] i co ec io wi h he re rieved
da a, he da a i
538 re ea ed for ur o e of im rovi g mo or vehic e afe y, ecuri y, or raffic
ma ageme ,
539 i c udi g medica re earch o he huma body' reac io o a mo or
vehic e cra h.
540 (5) (a) If a mo or vehic e i equi ed wi h a eve da a recorder ha i
ca ab e of
541 recordi g or ra mi i g eve da a a d ha ca abi i y i ar of a
ub cri io ervice, he fac

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542 ha he eve da a may be recorded or ra mi ed ha be di c o ed i
he ub cri io ervice

543 agreeme .
544 (b) No wi h a di g he rovi io of hi ec io , eve da a from a eve da a
545 recorder may be re rieved, ob ai ed, a d u ed by a ub cri io ervice rovider for
546 ub cri io ervice mee i g he requireme of Sub ec io (5)(a).
547 Sec io 7. Sec io **41-6a-102** i ame ded o read
548 **41-6a-102. Definitions.**
549 A u ed i hi cha er
550 (1) "A ey" mea a ree or highway i e ded o rovide acce o he rear or ide of
551 o or bui di g i urba di ric a d o i e ded for hrough vehicu ar raffic.
552 (2) "A - errai y e l vehic e" mea he ame a ha erm i defi ed i Sec io
553 41-22-2.
554 (3) "Au horized emerge cy vehic e" i c ude
555 (a) fire de ar me vehic e ;
556 (b) o ice vehic e ;
557 (c) ambu a ce ; a d
558 (d) o her ub ic y or riva e y ow ed vehic e a de ig a ed by he commi io er of he
559 De ar me of Pub ic Safe y.
560 (4) "Au ocyc e" mea he ame a ha erm i defi ed i Sec io 53-3-102.
561 (5) (a) "Bicyc e" mea a whee ed vehic e
562 (i) ro e ed by huma ower by fee or ha d ac i g u o eda or cra k ;
563 (ii) wi h a ea or add e de ig ed for he u e of he o era or;
564 (iii) de ig ed o be o era ed o he grou d; a d
565 (iv) who e whee are o e ha 14 i che i diame er.
566 (b) "Bicyc e" i c ude a e ec ric a i ed bicyc e.
567 (c) "Bicyc e" doe o i c ude coo er a d imi ar device .
568 (6) (a) "Bu " mea a mo or vehic e

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569 (i) de ig ed for carryi g more ha 15 a e ger a d u ed for he ra or a io of
570 er o ; or
571 (ii) de ig ed a d u ed for he ra or a io of er o for com e a io .
572 (b) "Bu " doe o i c ude a axicab.
573 (7) (a) "Circu ar i er ec io " mea a i er ec io ha ha a i a d, ge era y
574 circu ar i de ig , oca ed i he ce er of he i er ec io where raffic a e o he righ of
575 he i a d.
576 (b) "Circu ar i er ec io " i c ude
577 (i) rou dabou ;
578 (ii) ro arie ; a d
579 (iii) raffic circ e .
580 (8) "C a 1 e ec ric a i ed bicyc e" mea a e ec ric a i ed bicyc e de cribed i
581 Sub ec io (17)(d)(i).

582 (9 "C a 2 e ec ric a i ed bicyc e" mean an e ec ric a i ed bicyc e de cribed in
583 Sub ec ion (17 (d (ii .
584 (10 "C a 3 e ec ric a i ed bicyc e" mean an e ec ric a i ed bicyc e de cribed in
585 Sub ec ion (17 (d (iii .
586 (11 "Commi ioner" mean he commi ioner of he De ar men of Pub ic Safe y.
587 (12 "Con ro ed-acce highway" mean a highway, ree , or roadway
588 (a de igned rimari y for hrough raffic; and
589 (b o or from which owner or occu an of abu ing and and o her er on have no
590 ega righ of acce , exce a oin a de ermined by he highway au hori y having
591 juri dic ion over he highway, ree , or roadway.
592 (13 "Cro wa k" mean
593 (a ha ar of a roadway a an in er ec ion inc uded wi hin he connec ion of he
594 a era ine of he idewa k on o o i e ide of he highway mea ured from
595 (i (A he curb ; or

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596 (B in he ab ence of curb , from he edge of he raver ab e roadway; and
597 (ii in he ab ence of a idewa k on one ide of he roadway, ha ar of a roadway
598 inc uded wi hin he ex en ion of he a era ine of he exi ing idewa k a righ ang e o he
599 cen er ine; or
600 (b any or ion of a roadway a an in er ec ion or e ewhere di inc y indica ed for
601 ede rian cro ing by ine or o her marking on he urface.
602 (14 "De ar men " mean he De ar men of Pub ic Safe y.
603 (15 "Direc u ervi ion" mean over igh a a di ance wi hin which
604 (a vi ua con ac i main ained; and
605 (b advice and a i ance can be given and received.
606 (16 "Divided highway" mean a highway divided in o wo or more roadway by
607 (a an un aved in ervening ace;
608 (b a hy ica barrier; or
609 (c a c ear y indica ed dividing ec ion con ruc ed o im ede vehicu ar raffic.
610 (17 "E ec ric a i ed bicyc e" mean a bicyc e wi h an e ec ric mo or ha
611 (a ha a ower ou u of no more han 750 wa ;
612 (b ha fu y o erab e eda on ermanen y affixed crank ;
613 (c i fu y o erab e a a bicyc e wi hou he u e of he e ec ric mo or; and
614 (d i one of he fo owing
615 (i an e ec ric a i ed bicyc e equi ed wi h a mo or or e ec ronic ha
616 (A rovide a i ance on y when he rider i eda ing; and
617 (B cea e o rovide a i ance when he bicyc e reache he eed

of 20 mi e er
61 hour;
619 (ii) an e ec ric a i ed bicyc e equi ed wi h a mo or or e ec ronic ha
620 (A) may be u ed exc u ive y o ro e he bicyc e; and
621 (B) i no ca ab e of roviding a i ance when he bicyc e reache he eed of 20
622 mi e er hour; or

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623 (iii) an e ec ric a i ed bicyc e equi ed wi h a mo or or e ec ronic ha
624 (A) rovide a i ance on y when he rider i eda ing;
625 (B) cea e o rovide a i ance when he bicyc e reache he eed of 2 mi e er
626 hour; and
627 (C) i equi ed wi h a eedome er.
62 (1) (a) "E ec ric er ona a i ive mobi i y device" mean a e f-ba ancing device
629 wi h
630 (i) wo non andem whee in con ac wi h he ground;
631 (ii) a y em ca ab e of eering and o ing he uni under y ica o era ing
632 condi ion ;
633 (iii) an e ec ric ro u ion y em wi h average ower of one hor e ower or 750 wa ;
634 (iv) a maximum eed ca aci y on a aved, eve urface of 12.5 mi e er hour; and
635 (v) a deck de ign for a er on o and whi e o era ing he device.
636 (b) "E ec ric er ona a i ive mobi i y device" doe no inc ude a whee chair.
637 (19) "Ex o ive " mean any chemica com ound or mechanica mix ure common y
63 u ed or in ended for he ur o e of roducing an ex o ion and ha con ain any oxidizing and
639 combu ive uni or o her ingredien in ro or ion , quan i ie , or acking o ha an igni ion
640 by fire, fric ion, concu ion, ercu ion, or de ona or of any ar of he com ound or mix ure
641 may cau e a udden genera ion of high y hea ed ga e , and he re u an ga eou re ure are
642 ca ab e of roducing de ruc ive effec on con iguou objec or of cau ing dea h or eriou
643 bodi y injury.
644 (20) "Farm rac or" mean a mo or vehic e de igned and u ed rimari y a a farm
645 im emen , for drawing ow , mowing machine , and o her im emen of hu bandry.
646 (21) "F ammab e iquid" mean a iquid ha ha a f a h oin of 100 degree F. or e ,
647 a de ermined by a ag iabue or equiva en c o ed-cu e device.
64 (22) "Freeway" mean a con ro ed-acce highway ha i ar of he in er a e y em
649 a defined in Sec ion 72-1-102.

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650 (23 "Gore area" mean he area de inea ed by wo o id whi e ine
ha i be ween a
651 con inuing ane of a hrough roadway and a ane u ed o en er or exi he
con inuing ane
652 inc uding imi ar area be ween merging or i ing highway .
653 (24 "Gro weigh " mean he weigh of a vehic e wi hou a oad u
he weigh of
654 any oad on he vehic e.
655 (25 "Highway" mean he en ire wid h be ween ro er y ine of every
way or ace of
656 any na ure when any ar of i i o en o he u e of he ub ic a a ma er
of righ for vehicu ar
657 rave .
658 (26 "Highway au hori y" mean he ame a ha erm i defined in
Sec ion 72-1-102.
659 (27 (a "In er ec ion" mean he area embraced wi hin he
ro onga ion or connec ion
660 of he a era curb ine , or, if none, hen he a era boundary ine of he
roadway of wo or
661 more highway which join one ano her.
662 (b Where a highway inc ude wo roadway 30 fee or more a ar
663 (i every cro ing of each roadway of he divided highway by an
in er ec ing highway
664 i a e ara e in er ec ion; and
665 (ii if he in er ec ing highway a o inc ude wo roadway 30 fee or
more a ar , hen
666 every cro ing of wo roadway of he highway i a e ara e
in er ec ion.
667 (c "In er ec ion" doe no inc ude he junc ion of an a ey wi h a ree
or highway.
668 (28 "I and" mean an area be ween raffic ane or a an in er ec ion
for con ro of
669 vehic e movemen or for ede rian refuge de igna ed by
670 (a avemen marking , which may inc ude an area de igna ed by wo
o id ye ow
671 ine urrounding he erime er of he area;
672 (b channe izing device ;
673 (c curb ;
674 (d avemen edge ; or
675 (e o her device .
676 (29 "Law enforcemen agency" mean he ame a ha erm i a
defined in Sec ion

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677 53-1-102.
678 (30 "Limi ed acce highway" mean a highway
679 (a ha i de igna ed ecifica y for hrough raffic; and
680 (b over, from, or o which nei her owner nor occu an of abu ing
and nor o her
681 er on have any righ or ea emen , or have on y a imi ed righ or
ea emen of acce , igh ,
682 air, or view.
683 (31 "Loca highway au hori y" mean he egi a ive, execu ive, or
governing body of

684 a coun , munici a , or o her oca board or bod having au hori o enac
aw re a ing o
685 raffic under he con i u ion and aw of he a e.
686 (32) (a) "Low- eed vehic e" mean a four whee ed e ec ric mo or
vehic e ha
687 (i) i de igned o be o era ed a eed of no more han 25 mi e er
hour; and
688 (ii) ha a ca aci of no more han four a enger , inc uding [~~he~~
~~driver~~] a
689 conven iona driver or fa back-read u er if on board he vehic e, a ho e
erm are defined in
690 Sec ion 41-26-102.1.
691 (b) "Low- eed vehic e" doe no inc ude a go fcar or an off-highwa
vehic e.
692 (33) "Me a ire" mean a ire, he urface of which in con ac wi h he
highwa i
693 who or ar of me a or o her hard nonre i ien ma eria .
694 (34) (a) "Mini-mo orc c e" mean a mo orc c e or mo or-driven c c e
ha ha a ea or
695 add e ha i e han 24 inche from he ground a mea ured on a eve
urface wi h ro er
696 inf a ed ire .
697 (b) "Mini-mo orc c e" doe no inc ude a mo ed or a mo or a i ed
coo er.
698 (c) "Mini-mo orc c e" doe no inc ude a mo orc c e ha i
699 (i) de igned for off-highwa u e; and
700 (ii) regi ered a an off-highwa vehic e under Sec ion 41-22-3.
701 (35) "Mobi e home" mean
702 (a) a rai er or emi rai er ha i
703 (i) de igned, con ruc ed, and equi ed a a dwe ing ace, iving
abode, or ee ing

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704 ace ei her ermanen or em orari ; and
705 (ii) equi ed for u e a a conve ance on ree and highwa ; or
706 (b) a rai er or a emi rai er who e cha i and ex erior he i
de igned and
707 con ruc ed for u e a a mobi e home, a defined in Sub ec ion (35)(a),
bu ha i in ead u ed
708 ermanen or em orari for
709 (i) he adver i ing, a e, di a , or romo ion of merchandi e or
ervice ; or
710 (ii) an o her commercia ur o e exce he ran or a ion of ro er
for hire or he
711 ran or a ion of ro er for di ribu ion b a riva e carrier.
712 (36) (a) "Mo ed" mean a mo or-driven c c e having
713 (i) eda o ermi ro u ion b human ower; and
714 (ii) a mo or ha
715 (A) roduce no more han wo brake hor e ower; and
716 (B) i no ca ab e of ro e ing he c c e a a eed in exce of 30
mi e er hour on
717 eve ground.
718 (b) If an in erna combu ion engine i u ed, he di acemen ma no
exceed 50 cubic

719 cen ime er and he mo ed ha have a o er drive y em ha
func ion direc y or
720 au oma ica y i hou c u ching or hif ing by he o era or af er he drive
y em i engaged.
721 (c) "Mo ed" inc ude a mo or a i ed coo er.
722 (d) "Mo ed" doe no inc ude an e ec ric a i ed bicyc e.
723 (37) (a) "Mo or a i ed coo er" mean a e f- ro e ed device i h
724 (i) a ea o hee in con ac i h he ground;
725 (ii) a braking y em ca ab e of o ing he uni under y ica
o era ing condi ion ;
726 (iii) a ga or e ec ric mo or no exceeding 40 cubic cen ime er ;
727 (iv) ei her
728 (A) a deck de ign for a er on o and hi e o era ing he device; or
729 (B) a deck and ea de igned for a er on o i , radd e, or and
hi e o era ing he
730 device; and

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731 (v) a de ign for he abi i y o be ro e ed by human o er a one.
732 (b) "Mo or a i ed coo er" doe no inc ude an e ec ric a i ed
bicyc e.
733 (38) (a) "Mo or vehic e" mean a vehic e ha i e f- ro e ed and
every vehic e hich
734 i ro e ed by e ec ric o er ob ained from overhead ro ey ire , bu
no o era ed u on
735 rai .
736 (b) "Mo or vehic e" doe no inc ude vehic e moved o e y by human
o er,
737 mo orized hee chair , an e ec ric er ona a i ive mobi i y device, an
e ec ric a i ed
738 bicyc e, or a er ona de ivery device, a defined in Sec ion 41-6a-1119.
739 (39) "Mo orcyc e" mean
740 (a) a mo or vehic e, o her han a rac or, having a ea or add e for he
u e of he rider
741 and de igned o rave i h no more han hree hee in con ac i h he
ground; or
742 (b) an au ocyc e.
743 (40) (a) "Mo or-driven cyc e" mean every mo orcyc e, mo or coo er,
mo ed, mo or
744 a i ed coo er, and every mo orized bicyc e having
745 (i) an engine i h e han 150 cubic cen ime er di acemen ; or
746 (ii) a mo or ha roduce no more han five hor e o er.
747 (b) "Mo or-driven cyc e" doe no inc ude
748 (i) an e ec ric er ona a i ive mobi i y device; or
749 (ii) an e ec ric a i ed bicyc e.
750 (41) "Off-high ay im emen of hu bandry" mean he ame a ha
erm i defined
751 under Sec ion 41-22-2.
752 (42) "Off-high ay vehic e" mean he ame a ha erm i defined
under Sec ion
753 41-22-2.
754 (43) "O era e" mean he ame a ha erm i defined in Sec ion 41-
1a-102.

[~~(43~~] (44 "O era or" mean [~~a er on who i in ac ua hy ica con ro of a vehic e.~~]

(a a human driver, a defined in Sec ion 41-26-102.1, ha o era e a vehic e; or

(b an au oma ed driving y em, a defined in Sec ion 41-26-102.1, ha o era e a

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vehic e.

[~~(44~~] (45 (a "Park" or " arking" mean he anding of a vehic e, whe her he vehic e i occu ied or no .

(b "Park" or " arking" doe no inc ude

(i he anding of a vehic e em orari y for he ur o e of and whi e ac ua y engaged in oading or un oading ro er y or a enger [-]; or

(ii a mo or vehic e wi h an engaged au oma ed driving y em ha ha achieved a minima ri k condi ion, a ho e erm are defined in Sec ion 41-26-102.1.

[~~(45~~] (46 "Peace officer" mean a eace officer au horized under Ti e 53, Cha er 13, Peace Officer C a ifica ion , o direc or regu a e raffic or o make arre for vio a ion of raffic aw .

[~~(46~~] (47 "Pede rian" mean a er on rave ing

(a on foo ; or

(b in a whee chair.

[~~(47~~] (48 "Pede rian raffic-con ro igna " mean a raffic-con ro igna u ed o regu a e ede rian .

[~~(48~~] (49 "Per on" mean [~~every~~] a na ura er on, firm, co ar ner hi , a ocia ion,

[~~or~~] cor ora ion, bu ine ru , e a e, ru , ar ner hi , imi ed iabi i y com any, a ocia ion,

join ven ure, governmen a agency, ub ic cor ora ion, or any o her ega or commercia en i y.

[~~(49~~] (50 "Po e rai er" mean every vehic e wi hou mo ive ower

(a de igned o be drawn by ano her vehic e and a ached o he owing vehic e by mean of a reach, or o e, or by being boomed or o herwi e ecured o he owing vehic e; and

(b ha i ordinari y u ed for ran or ing ong or irregu ar ha ed oad inc uding o e , i e , or ruc ura member genera y ca ab e of u aining hem e ve a beam be ween he u or ing connec ion .

[~~(50~~] (51 "Priva e road or driveway" mean every way or ace in riva e owner hi and u ed for vehicu ar rave by he owner and ho e having ex re or im ied ermi ion

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from he owner, bu no by o her er on .

[~~(51~~] (52 "Rai road" mean a carrier of er on or ro er y u on car o era ed on

a iona y ai .

[~~(52)~~] (53) "Rai oad ign o igna " mean a ign, igna , o device e ec ed by au ho i y of a ub ic body o officia o by a ai oad and in ended o give no ice of he e ence of ai oad ack o he a oach of a ai oad ain.

[~~(53)~~] (54) "Rai oad ain" mean a ocomo ive o e ed by any fo m of ene gy, cou ed wi h o o e a ed wi hou ca , and o e a ed u on ai .

[~~(54)~~] (55) "Righ -of-way" mean he igh of one vehic e o ede ian o oceed in a awfu manne in efe ence o ano he vehic e o ede ian a oaching unde ci cum ance of di ec ion, eed, and oximi y ha give i e o dange of co i ion un e one g an ecedence o he o he .

[~~(55)~~] (56) (a) "Roadway" mean ha o ion of highway im oved, de igned, o o dina i y u ed fo vehicu a ave .

(b) "Roadway" doe no inc ude he idewa k, be m, o hou de , even hough any of hem a e u ed by e on iding bicyc e o o he human- owe ed vehic e .

(c) "Roadway" efe o any oadway e a a e y bu no o a oadway co ec ive y, if a highway inc ude wo o mo e e a a e oadway .

[~~(56)~~] (57) "Safe y zone" mean he a ea o ace officia y e a a wi hin a oadway fo he exc u ive u e of ede ian and ha i o ec ed, ma ked, o indica ed by adequa e ign a o be ain y vi ib e a a ime whi e e a a a a afe y zone.

[~~(57)~~] (58) (a) "Schoo bu " mean a mo o vehic e ha

(i) com ie wi h he co o and iden ifica ion equi emen of he mo ecen edi ion of "Minimum S anda d fo Schoo Bu e "; and

(ii) i u ed o an o choo chi d en o o f om choo o choo ac ivi ie .

(b) "Schoo bu " doe no inc ude a vehic e o e a ed by a common ca ie in an o a ion of choo chi d en o o f om choo o choo ac ivi ie .

[~~(58)~~] (59) (a) "Semi ai e " mean a vehic e wi h o wi hou mo ive owe

(i) de igned fo ca ying e on o o e y and fo being d awn by a mo o vehic e;

and

(ii) con uc ed o ha ome a of i weigh and ha of i oad e on o i ca ied by ano he vehic e.

(b) "Semi ai e " doe no inc ude a o e ai e .

[~~(59)~~] (60) "Shou de a ea" mean

(a) ha a ea of he ha d- u faced highway e a a ed f om he oadway by a avemen edge ine a e ab i hed in he cu en a oved "Manua on Unifo m

Traffic Con ro Device ";
or
(b) ha or ion of he road con iguou o he roadway for accommoda ion of o ed
vehic e , for emergency u e, and for a era u or .
[~~(60)~~] (61) "Sidewa k" mean ha or ion of a ree be ween he curb ine , or he
a era ine of a roadway, and he adjacen ro er y ine in ended for he u e of ede rian .
[~~(61)~~] (62) "So id rubber ire" mean a ire of rubber or o her re i ien ma eria ha
doe no de end on com re ed air for he u or of he oad.
[~~(62)~~] (63) "S and" or " anding" mean he em orary ha ing of a vehic e, whe her
occu ied or no , for he ur o e of and whi e ac ua y engaged in receiving or di charging
a enger .
[~~(63)~~] (64) "S o " when required mean com e e ce a ion from movemen .
[~~(64)~~] (65) "S o " or " o ing" when rohibi ed mean any ha ing even momen ari y
of a vehic e, whe her occu ied or no , exce when
(a) nece ary o avoid conf ic wi h o her raffic; or
(b) in com iance wi h he direc ion of a eace officer or raffic-con ro device.
[~~(65)~~] (66) "S ree - ega a - errain vehic e" or " ree - ega ATV" mean an a - errain
y e I vehic e, a - errain y e II vehic e, or a - errain y e III vehic e, ha i modified o mee
he requiremen of Sec ion 41-6a-1509 o o era e on highway in he a e in accordance wi h

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Sec ion 41-6a-1509.

[~~(66)~~] (67) "Traffic" mean ede rian , ridden or herded anima , vehic e , and o her
conveyance ei her ing y or oge her whi e u ing any highway for he ur o e of rave .
[~~(67)~~] (68) "Traffic igna reem ion device" mean an in rumen or mechani m
de igned, in ended, or u ed o in erfere wi h he o era ion or cyc e of a raffic-con ro igna .
[~~(68)~~] (69) "Traffic-con ro device" mean a ign, igna , marking, or device no
incon i en wi h hi cha er aced or erec ed by a highway au hori y for he ur o e of
regu a ing, warning, or guiding raffic.
[~~(69)~~] (70) "Traffic-con ro igna " mean a device, whe her manua y, e ec rica y, or
mechanica y o era ed, by which raffic i a erna e y direc ed o o and ermi ed o roceed.
[~~(70)~~] (71) (a) "Trai er" mean a vehic e wi h or wi hou mo ive ower de igned for
carrying er on or ro er y and for being drawn by a mo or vehic e and

con ruc ed o ha no
ar of i weigh re u on he owing vehic e.
(b) "Trai er" doe no inc ude a o e rai er.
[~~(71)~~] (72) "Truck" mean a mo or vehic e de igned, u ed, or main ained rimari y for
he ran or a ion of ro er y.
[~~(72)~~] (73) "Truck rac or" mean a mo or vehic e
(a) de igned and u ed rimari y for drawing o her vehic e ; and
(b) con ruc ed o carry a ar of he weigh of he vehic e and oad drawn by he ruck
rac or.
[~~(73)~~] (74) "Two-way ef urn ane" mean a ane
(a) rovided for vehic e o era or making ef urn in ei her direc ion;
(b) ha i no u ed for a ing, over aking, or hrough rave ; and
(c) ha ha been indica ed by a ane raffic-con ro device ha may inc ude ane
marking .
[~~(74)~~] (75) "Urban di ric " mean he erri ory con iguou o and inc uding any ree ,
in which ruc ure devo ed o bu ine , indu ry, or dwe ing hou e are i ua ed a in erva of

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e han 100 fee , for a di ance of a quar er of a mi e or more.
[~~(75)~~] (76) "Vehic e" mean a device in, on, or by which a er on or ro er y i or may
be ran or ed or drawn on a highway, exce device u ed exc u ive y on a ionary rai or
rack .
Sec ion . Sec ion **41-6a-1641** i amended o read
41-6a-1641. Video display in motor vehicles prohibited if visible to driver -- Exceptions.
(1) A mo or vehic e may no be o era ed on a highway if he mo or vehic e i equi ed wi h a video di ay oca ed o ha he di ay i vi ib e o he [~~o era or~~] conven iona driver of he vehic e a ha erm i defined in Sec ion 41-26-102.1.
(2) Thi ec ion doe no rohibi he u e of a video di ay u ed exc u ive y for
(a) afe y or aw enforcemen ur o e if he u e i a roved by ru e of he de ar men under Sec ion 41-6a-1601;
(b) mo or vehic e naviga ion; [~~or~~]
(c) moni oring of equi men and o era ing y em of he mo or vehic e[~~-~~]; or
(d) o era ion of a vehic e in a connec ed a ooning y em.
(3) A vio a ion of hi ec ion i an infrac ion.
Sec ion 9. Sec ion **41-26-102.1** i enac ed o read
41-26-102.1. Definitions.
(1) "ADS-dedica ed vehic e" mean a vehic e de igned o be o era ed exc u ive y by a eve four or five ADS for a ri wi hin he given o era iona de ign domain imi a ion of

887 he AD , if any.
888 (2) (a) "Au oma ed driving y em" or "AD " mean he hardware and of ware ha
889 are co ec ive y ca ab e of erforming he en ire dynamic driving a k on a u ained ba i ,
890 regard e of whe her he AD i imi ed o a ecific o era iona de ign domain, if any.
891 (b) "Au oma ed driving y em" or "AD " i u ed ecifica y o de cribe a eve hree,
892 four, or five driving au oma ion y em.

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893 (3) "Commi ion" mean he a e Tax Commi ion a defined in ec ion 59-1-101.

894 (4) "Conven iona driver" mean a human driver who i onboard he mo or vehic e and
895 manua y erform ome or a of he fo owing ac ion in order o o era e a vehic e
896 (a) braking;
897 (b) acce era ing;
898 (c) eering; and
899 (d) ran mi ion gear e ec ion in u device .
900 (5) (a) "Di a ch" mean o ace an AD -equi ed vehic e in o ervice in driver e
901 o era ion by engaging he AD .
902 (b) "Di a ch" inc ude of ware-enab ed di a ch of mu i e AD - equi ed mo or
903 vehic e in driver e o era ion ha may com e e mu i e ri invo ving ick-u and
904 dro -off of a enger or good hroughou a day or o her re-defined eriod of ervice, and
905 which may invo ve mu i e agen erforming variou a k re a ed o he di a ch func ion.
906 (6) "Divi ion" mean he Mo or Vehic e Divi ion of he commi ion, crea ed in
907 ec ion 41-1a-106.

908 (7) "Driver e o era ion" mean he o era ion of an AD -equi ed vehic e in which
909 (a) no on-board u er i re en ; or
910 (b) no on-board u er i a human driver or fa back-ready u er.
911 (8) "Driver e o era ion di a cher" mean a u er who di a che an AD -equi ed
912 vehic e in driver e o era ion.
913 (9) "Driving au oma ion y em" mean he hardware and of ware co ec ive y ca ab e
914 of erforming ar or a of he dynamic driving a k on a u ained ba i .
915 (10) "Driving au oma ion y em fea ure" mean a ecific func ion of a driving
916 au oma ion y em.
917 (11) (a) "Dynamic driving a k" mean a of he rea - ime o era iona and ac ica
918 func ion required o o era e a mo or vehic e in on-road raffic, inc uding
919 (i) a era vehic e mo ion con ro hrough eering;

(ii) ongi u ina mo ion con ro hrough acce era ion an ece era ion;
(iii) moni oring he riving environmen hrough objec an even e ec ion,
recogni ion, c a ifica ion, an re on e re ara ion;
(iv) objec an even re on e execu ion;
(v) maneuver anning; an
(vi) enhancing con icui y wi h igh ing, igna ing, an ge uring.
(b) "Dynamic riving a k" oe no inc u e ra egic func ion uch a ri che u ing
an e ec ion of e ina ion an way oin .
(12) "Engage" a i er ain o he o era ion of a vehic e by a riving au oma ion
y em mean o cau e a riving au oma ion y em fea ure o erform ar or a of he
ynamic riving a k on a u aine ba i .
(13) "Ex erna even " i a i ua ion in he riving environmen ha nece i a e a
re on e by a human river or riving au oma ion y em.
(14) "Fa back-rea y u er" mean he u er of a vehic e equi e wi h an engage eve
hree ADS who i
(a) a human river; an
(b) rea y o o era e he vehic e if
(i) a y em fai ure occur ; or
(ii) he ADS i ue a reque o in ervene.
(15) (a) "Human river" mean a na ura er on
(i) wi h a va i icen e o o era e a mo or vehic e of he ro er c a for he mo or
vehic e being o era e ; an
(ii) who erform in rea - ime a or ar of he ynamic riving a k.
(b) "Human river" inc u e a
(i) conven iona river; an
(ii) remo e river.
(16) "Leve five au oma e riving y em" or " eve five ADS" mean an ADS fea ure

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ha ha he ca abi i y o erform on a u aine ba i he en ire ynamic riving a k un er a
con i ion ha can rea onab y be manage by a human river, a we a any maneuver
nece ary o re on o a y em fai ure, wi hou any ex ec a ion ha a human u er wi
re on o a reque o in ervene.
(17) "Leve four au oma e riving y em" or " eve four ADS" mean an ADS fea ure
ha , wi hou any ex ec a ion ha a human u er wi re on o a reque o in ervene, ha
(a) he ca abi i y o erform on a u aine ba i he en ire ynamic riving a k wi hin
i o era iona e ign omain; an
(b) he ca abi i y o erform any maneuver nece ary o achieve a minima ri k
con i ion in re on e o
(i) an exi from he o era iona e ign omain of he ADS; or

(ii a y em fai ure.
(18 "Leve hree au oma ed driving y em" or " eve hree ADS" mean an ADS
fea ure ha
(a ha he ca abi i y o erform on a u ained ba i he en ire dynamic driving a k
wi hin i o era iona de ign domain; and
(b require a fa back-ready u er o o era e he vehic e af er receiving a reque o
in ervene or in re on e o a y em fai ure.
(19 "Minima ri k condi ion" mean a condi ion o which a u er or an ADS may bring
a mo or vehic e in order o reduce he ri k of a cra h when a given ri canno or hou d no be
com e ed.
(20 "Objec and even de ec ion and re on e" mean he ub a k of he dynamic
driving a k ha inc ude
(a moni oring he driving environmen ; and
(b execu ing an a ro ria e re on e in order o erform he dynamic driving a k.
(21 "On-demand au onomou vehic e ne work" mean a ran or a ion ervice
ne work ha u e a of ware a ica ion or o her digi a mean o di a ch or o herwi e enab e

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he rearrangemen of ran or a ion wi h mo or vehic e ha have a eve four or five ADS in
driver e o era ion for ur o e of ran or ing er on , inc uding for-hire ran or a ion and
ran or a ion for com en a ion.
(22 "O era e" mean he ame a ha erm i defined in Sec ion 41-1a-102.
(23 "O era iona de ign domain" mean he o era ing condi ion under which a given
ADS or fea ure hereof i ecifica y de igned o func ion, inc uding
(a eed range, environmen a , geogra hica , and ime-of-day re ric ion ; or
(b he requi i e re ence or ab ence of cer ain raffic or roadway charac eri ic .
(24 "O era or" mean he ame a ha erm i defined in Sec ion 41-6a-102.
(25 "Pa enger" mean a u er on board a vehic e who ha no ro e in he o era ion of
ha vehic e.
(26 "Per on" mean he ame a ha erm i defined in Sec ion 41-6a-102.
(27 "Remo e driver" mean a human driver who i no oca ed in a o i ion o
manua y exerci e in-vehic e braking, acce era ing, eering, or ran mi ion gear e ec ion
in u device , bu o era e he vehic e.

(28) Reque o in ervene mean he no ifica ion by an ADS o a fa back-ready u er indica ing ha he fa back-ready u er hou d rom y begin or re ume o era ion of he vehic e.

(29) Su ained o era ion of a mo or vehic e mean he erformance of ar or a of he dynamic driving a k bo h be ween and acro ex erna even , inc uding re on e o ex erna even and con inued erformance of ar or a of he dynamic driving a k in he ab ence of ex erna even .

(30) Sy em fai ure mean a ma func ion in a driving au oma ion y em or o her vehic e y em ha reven he ADS from re iab y erforming he or ion of he dynamic driving a k on a u ained ba i , inc uding he com e e dynamic driving a k, ha he ADS wou d o herwi e erform.

(31) U er mean a

(a) human driver;

(b) a enger;

(c) fa back-ready u er; or

(d) driver e o era ion di a cher.

Sec ion 10. Sec ion **41-26-103** i enac ed o read

41-26-103. Operation of motor vehicles equipped with an automated driving system.

(1) A mo or vehic e equi ed wi h a eve hree ADS may o era e on a highway in hi a e if

(a) he mo or vehic e i o era ed, whe her by he ADS or human driver, in com iance wi h he a icab e raffic and mo or vehic e afe y aw and regu a ion of hi a e, un e an exem ion ha been gran ed;

(b) when required by federa aw, he mo or vehic e

(i) ha been cer ified a being in com iance wi h a a icab e mo or vehic e afe y andard ; and

(ii) bear he required cer ifica ion abe , inc uding reference o any exem ion gran ed under federa aw;

(c) when o era ed by an ADS, if a y em fai ure occur ha render he ADS unab e o erform he en ire dynamic driving a k re evan o he in ended o era iona de ign domain of he ADS, he ADS wi achieve a minima ri k condi ion or make a reque o in ervene; and

(d) he mo or vehic e i i ed and regi ered in com iance wi h Sec ion 41-26-107.

(2) A mo or vehic e equi ed wi h a eve four or eve five ADS may

o era e in
driver e o era ion on a high ay in hi a e if
(a) he ADS i ca ab e of o era ing in com iance i h a ica b e raffic and mo or
vehic e a and regu a ion of hi a e, un e an exem ion ha been gran ed;
(b) hen required by federa a , he mo or vehic e
(i) ha been cer ified a being in com iance i h a a ica b e Federa Mo or Vehic e

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Safe y S andard and regu a ion ; and
(ii) bear he required cer ifica ion abe inc uding reference o any exem ion gran ed
under federa a ;
(c) a y em fai ure occur ha render he ADS unab e o erform he en ire dynamic
driving a k re evan o he in ended o era iona de ign domain of he ADS, a minima ri k
condi ion i be achieved; and
(d) he mo or vehic e i i ed and regi ered in com iance i h Sec ion 41-26-107.
(3) A vehic e being o era ed by an ADS or a remo e driver i no con idered
una ended.
(4) The divi ion may revoke he regi ra ion and ri ege for a vehic e equi ed i h
an ADS o o era e on a high ay of he a e if he De ar men of Tran or a ion or he
De ar men of Pub ic Safe y de ermine and no ifie he divi ion ha
(a) he ADS i o era ing in an un afe manner; or
(b) he vehic e' ADS i being engaged in an un afe manner.
(5) S ecia mobi e equi men , a defined in Sec ion 41-1a-102, equi ed i h a eve
hree, four, or five ADS, may be moved or o era ed inciden a y over a high ay.
(6) No hing in hi cha er rohibi or re ric a human driver from o era ing a
vehic e equi ed i h an ADS and equi ed i h con ro ha a o for he human driver o
erform a or ar of he dynamic driving a k.
Sec ion 11. Sec ion **41-26-104** i enac ed o read
41-26-104. Licensing -- Responsibility for compliant operation of ADS-equipped vehicles.
For he ur o e of a e ing com iance i h a ica b e raffic or mo or vehic e a
(1) (a) When an ADS i o era ing a mo or vehic e, he ADS i he o era or, and ha
a i fy e ec ronica y a hy ica ac required by a conven iona driver in o era ion of he
vehic e.
(b) The ADS i re on ib e for he com ian o era ion of he vehic e and i no

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require o be icen e o o era e he vehic e.
(2) (a) If a vehic e wi h an engage eve hree ADS i ue a reque o in ervene, he
ADS i re on ib e for he com ian o era ion of he vehic e un i i engagemen of he ADS.
(b) If a vehic e wi h an engage eve four or five ADS i ue a reque o in ervene,
he ADS i re on ib e for he com ian o era ion of he vehic e un i or un e a human u er
begin o o era e he vehic e.
(3) The ADS i re on ib e for com ian o era ion of an ADS-e ica e vehic e.

Sec ion 12. Sec ion **41-26-105** i enac e o rea

41-26-105. Duties following crashes involving motor vehicles equipped with an automated driving system.

(1) In he even of a cra h invo ving a vehic e wi h he ADS engage
(a) he ADS-equi e vehic e ha remain on he cene of he cra h when require o
o un er Sec ion 41-6a-401, con i en wi h he vehic e' abi i y o achieve a minima ri k
con i ion a e cribe in Sec ion 41-26-103; an
(b) he owner of he ADS-equi e vehic e, or a er on on beha f of he vehic e owner,
ha re or any cra he or co i ion con i en wi h Cha er 6a, Par 4, Acci en Re on ibi i ie .
(2) If he owner or er on on beha f of he owner i no on boar he vehic e a he ime of he cra h, he owner ha en ure ha he fo owing informa ion i imme ia e y communica e or ma e avai ab e o he er on invo ve or o a eace officer u on reque
(a) he con en of he vehic e' regi ra ion car ; an
(b) he name of he in urance rovi er for he vehic e, inc u ing he hone number of he agen or rovi er.
(3) The e ar men may require ha an acci en re or fi e un er Sec ion 41-6a-402 inc u e
(a) whe her a vehic e equi e wi h an ADS wa invo ve in he acci en ; an
(b) whe her he ADS wa engage a he ime of he acci en .

Sec ion 13. Sec ion **41-26-106** i enac e o rea

41-26-106. On-demand autonomous vehicle network.

(1) Subjec o Sub ec ion (2), an on- eman au onomou vehic e ne work may on y
o era e ur uan o a e aw governing he o era ion of groun ran or a ion for-hire un er a e aw, inc u ing
(a) a ran or a ion ne work com any ur uan o Ti e 13, Cha er

51, T an o a ion
1088 Ne wo k Com any Regi a ion Ac ;
1089 (b) a ub ic an i di ic a defined in Sec ion 17B-2a-802; o
1090 (c) a iva e a enge ca ie a defined in Sec ion 53-3-102.
1091 (2) Any ovi ion of a e aw de c ibed in Sub ec ion (1) ha ea onab y a ie on y
1092 o a human d ive , inc uding Sub ec ion 13-51-105(5)(b), ha no a y o he o e a ion of a
1093 vehic e by an engaged eve fou o five ADS ha i a of an on-demand au onomou vehic e
1094 ne wo k.
1095 Sec ion 14. Sec ion **41-26-107** i enac ed o ead
1096 **41-26-107. Registration, title, and insurance of motor vehicles equipped with an**
1097 **automated driving system.**
1098 (1) If he owne of a vehic e equi ed wi h an ADS i a e iden of hi a e, he owne
1099 ha o e y egi e he vehic e in acco dance wi h Cha e 1a, Pa 2, Regi a ion.
1100 (2) If he owne of a vehic e equi ed wi h an ADS i a e iden of hi a e, he owne
1101 ha o e y i e he vehic e in acco dance wi h Cha e 1a, Pa 5, Ti ing Requi emen .
1102 (3) Befo e an ADS may o e a e a vehic e on a highway in hi a e, he owne of he
1103 vehic e ha en u e ha he vehic e com ie wi h Cha e 12a, Financia Re on ibi i y of
1104 Mo o Vehic e Owne and O e a o Ac .
1105 Sec ion 15. Sec ion **41-26-108** i enac ed o ead
1106 **41-26-108. Controlling authority.**
1107 No oca agency, o i ica ubdivi ion, o o he en i y may ohibi he o e a ion of a
1108 vehic e equi ed wi h a d iving au oma ion y em, an ADS, o an on-demand au onomou

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1109 vehic e ne wo k, o o he wi e enac o kee in fo ce a u e o o dinance ha wou d im o e a
1110 ax, fee, e fo mance anda d, o o he equi emen ecific o he o e a ion of a vehic e
1111 equi ed wi h a d iving au oma ion y em, an ADS, o an on-demand au onomou vehic e
1112 ne wo k in addi ion o he equi emen of hi i e.
1113 Sec ion 16. Sec ion **53-3-102** i amended o ead
1114 **53-3-102. Definitions.**
1115 A u ed in hi cha e
1116 (1) "Au ocyc e" mean a mo o vehic e ha
1117 (a) i de igned o ave wi h h ee o fewe whee in con ac wi h he g ound;
1118 (b) i equi ed wi h a ee ing whee ; and
1119 (c) i equi ed wi h ea ing ha doe no equi e he o e a o o add e o i a ide
1120 he vehic e.

(2) Cance a ion mean he ermina ion by he divi ion of a icen e i ued hrough error or fraud or for which con en under Sec ion 53-3-211 ha been wi hdrawn.

(3) C a D icen e mean he c a of icen e i ued o drive mo or vehic e no defined a commercia mo or vehic e or mo orcyc e under hi cha er.

(4) Commercia driver in ruc ion ermi or CDIP mean a commercia earner ermi

(a) i ued under Sec ion 53-3-408; or

(b) i ued by a a e or o her juri dic ion of domici e in com iance wi h he andard con ained in 49 C.F.R. Par 383.

(5) Commercia driver icen e or CDL mean a icen e

(a) i ued ub an ia y in accordance wi h he requiremen of Ti e XII, Pub. L. 99-570, he Commercia Mo or Vehic e Safe y Ac of 1986, and in accordance wi h Par 4, Uniform Commercia Driver Licen e Ac , which au horize he ho der o drive a c a of commercia mo or vehic e; and

(b) ha wa ob ained by roviding evidence of awfu re ence in he Uni ed S a e

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wi h one of he documen requiremen de cribed in Sub ec ion 53-3-410(1)(i)(i).

(6) (a) Commercia driver icen e mo or vehic e record or CDL MVR mean a driving record ha

(i) a ie o a er on who ho d or i required o ho d a commercia driver in ruc ion ermi or a CDL icen e; and

(ii) con ain he fo owing

(A) informa ion con ained in he driver hi ory, inc uding convic ion , ea he d in abeyance, di qua ifica ion , and o her icen ing ac ion for vio a ion of any a e or oca aw re a ing o mo or vehic e raffic con ro , commi ed in any y e of vehic e;

(B) driver e f-cer ifica ion a u informa ion under Sec ion 53-3-410.1; and

(C) informa ion from medica cer ifica ion record kee ing in accordance wi h 49 C.F.R. Sec. 383.73(o).

(b) Commercia driver icen e mo or vehic e record or CDL MVR doe no mean a mo or vehic e record de cribed in Sub ec ion [~~(30)~~] (29).

(7) (a) Commercia mo or vehic e mean a mo or vehic e or combina ion of mo or vehic e de igned or u ed o ran or a enger or ro er y if he mo or vehic e

(i) ha a gro vehic e weigh ra ing of 26,001 or more ound or a

e er ra ing a
11 3 de ermined by federa regu a ion;
11 4 (ii) i de igned o ran or 16 or more a enger , inc uding he driver; or
11 (iii) i ran or ing hazardou ma eria and i required o be acarded in accordance
11 6 wi h 49 C.F.R. Par 172, Sub ar F.
11 7 (b) The fo owing vehic e are no con idered a commercia mo or vehic e for ur o e
11 8 of Par 4, Uniform Commercia Driver Licen e Ac
11 9 (i) equi men owned and o era ed by he Uni ed S a e De ar men of Defen e when
1160 driven by any ac ive du y mi i ary er onne and member of he re erve and na iona guard on
1161 ac ive du y inc uding er onne on fu - ime na iona guard du y, er onne on ar - ime
1162 raining, and na iona guard mi i ary echnician and civi ian who are required o wear mi i ary

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1163 uniform and are ubjec o he code of mi i ary ju ice;
1164 (ii) vehic e con ro ed and driven by a farmer o ran or agricu ura roduc , farm
116 machinery, or farm u ie o or from a farm wi hin 1 0 mi e of hi farm bu no in o era ion
1166 a a mo or carrier for hire;
1167 (iii) firefigh ing and emergency vehic e ;
1168 (iv) recrea iona vehic e ha are no u ed in commerce and are driven o e y a fami y
1169 or er ona conveyance for recrea iona ur o e ; and
1170 (v) vehic e u ed o rovide ran or a ion ne work ervice , a defined in Sec ion
1171 13- 1-102.
1172 (8) "Convic ion" mean any of he fo owing
1173 (a) an unvaca ed adjudica ion of gui or a de ermina ion ha a er on ha vio a ed or
1174 fai ed o com y wi h he aw in a cour of origina juri dic ion or an admini ra ive roceeding;
117 (b) an unvaca ed forfei ure of bai or co a era de o i ed o ecure a er on'
1176 a earance in cour ;
1177 (c) a ea of gui y or no o con endere acce ed by he cour ;
1178 (d) he aymen of a fine or cour co ; or
1179 (e) vio a ion of a condi ion of re ea e wi hou bai , regard e of whe her he ena y i
1180 reba ed, u ended, or roba ed.
1181 (9) "Denia " or "denied" mean he wi hdrawa of a driving rivi ege by he divi ion o
1182 which he rovi ion of Ti e 41, Cha er 12a, Par 4, Proof of Owner' or O era or' Securi y,
1183 do no a y.
1184 (10) "Direc or" mean he divi ion direc or a oin ed under Sec ion 3-3-103.
118 (11) "Di qua ifica ion" mean ei her

(a he u en ion, revoca ion, cance a ion, denia , or any o her wi hdrawa by a a e of a er on' rivi ege o drive a commercia mo or vehic e;

(b a de ermina ion by he Federa Highway Admini ra ion, under 49 C.F.R. Par 386, ha a er on i no onger qua ified o drive a commercia mo or vehic e under 49 C.F.R. Par

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391; or

(c he o of qua ifica ion ha au oma ica y fo ow convic ion of an offen e i ed in 49 C.F.R. Par 383.51.

(12 "Divi ion" mean he Driver Licen e Divi ion of he de ar men crea ed in Sec ion 53-3-103.

(13 "Downgrade" mean o ob ain a ower icen e c a han wha wa origina y i ued during an exi ing icen e cyc e.

(14 "Drive" mean

(a o o era e or be in hy ica con ro of a mo or vehic e u on a highway; and

(b in Sub ec ion 53-3-414(1 hrough (3 , Sub ec ion 53-3-414(5 , and Sec ion 53-3-417 and 53-3-418, he o era ion or hy ica con ro of a mo or vehic e a any ace wi hin he a e.

(15 (a "Driver" mean [~~any er on~~] an individua who drive , or i in ac ua hy ica con ro of a mo or vehic e in any oca ion o en o he genera ub ic for ur o e of vehicu ar raffic.

(b In Par 4, Uniform Commercia Driver Licen e Ac , "driver" inc ude any er on who i required o ho d a CDL under Par 4, Uniform Commercia Driver Licen e Ac , or federa aw.

(16 "Driving rivi ege card" mean he evidence of he rivi ege gran ed and i ued under hi cha er o drive a mo or vehic e o a er on who e rivi ege wa ob ained wi hou roviding evidence of awfu re ence in he Uni ed S a e .

(17 "Ex en ion" mean a renewa com e ed in a manner ecified by he divi ion.

(18 "Farm rac or" mean every mo or vehic e de igned and u ed rimari y a a farm im emen for drawing ow , mowing machine , and o her im emen of hu bandry.

(19 "Highway" mean he en ire wid h be ween ro er y ine of every way or ace of any na ure when any ar of i i o en o he u e of he ub ic, a a ma er of righ , for raffic.

(20 "Human driver" mean he ame a ha erm i defined in Sec ion 41-26-102.1.

[~~(20~~] (21 . "Iden ification card" mean a card i ued under Par 8, Iden ification Card Ac , o a er on for iden ification ur o e .

[~~(21~~] (22 . "Indigen " mean ha a er on' income fa be ow he federa over y guide ine i ued annua y by he U.S. De ar men of Hea h and Human Service in he Federa Regi er.

[~~(22~~] (23 . "Licen e" mean he rivi ege o drive a mo or vehic e.

[~~(23~~] (24 . (a "Licen e cer ification" mean he evidence of he rivi ege i ued under hi cha er o drive a mo or vehic e.

(b "Licen e cer ification" evidence inc ude a

(i regu ar icen e cer ification;

(ii imi ed- erm icen e cer ification;

(iii driving rivi ege card;

(iv CDL icen e cer ification;

(v imi ed- erm CDL icen e cer ification;

(vi em orary regu ar icen e cer ification; and

(vii em orary imi ed- erm icen e cer ification.

[~~(24~~] (25 . "Limi ed- erm commercia driver icen e" or " imi ed- erm CDL" mean a icen e

(a i ued ub an ia y in accordance wi h he requiremen of Ti e XII, Pub. L. No. 99-570, he Commercia Mo or Vehic e Safe y Ac of 1986, and in accordance wi h Par 4, Uniform Commercia Driver Licen e Ac , which au horize he ho der o drive a c a of commercia mo or vehic e; and

(b ha wa ob ained by roviding evidence of awfu re ence in he Uni ed S a e wi h one of he documen requiremen de cribed in Sub ec ion 53-3-410(1 (i (ii .

[~~(25~~] (26 . "Limi ed- erm iden ification card" mean an iden ification card i ued under hi cha er o a er on who e card wa ob ained by roviding evidence of awfu re ence in he Uni ed S a e wi h one of he documen requiremen de cribed in Sub ec ion 53-3-804(2 (i (ii .

[~~(26~~] (27 . "Limi ed- erm icen e cer ification" mean he evidence of he rivi ege gran ed and i ued under hi cha er o drive a mo or vehic e o a er on who e rivi ege wa ob ained roviding evidence of awfu re ence in he Uni ed S a e wi h one of he documen requiremen de cribed in Sub ec ion 53-3-205(8 (a (ii (B .

[~~(27 "Mo orboa " mean he ame a ha erm i defined in Sec ion 73-18-2.~~]

[~~(28 "Mo orcyc e" mean every mo or vehic e, o her han a rac or,~~

~~having a ea or~~
~~a e for he u e of he ri er an e igne o rave wi h no more han hree whee in con ac~~
~~wi h he groun .~~]
[~~(29) "Mo or vehic e" mean he ame a ha erm i efine in Sec ion 41-1a-102.~~]
[~~(30) "Mo or vehic e recor " or "MVR" mean a riving recor un er Sub ec ion 53-3-109(6)(a).~~]
(28) "Mo or vehic e" mean he ame a ha erm i efine in Sec ion 41-1a-102.
(29) "Mo or vehic e recor " or "MVR" mean a riving recor un er Sub ec ion 53-3-109(6)(a).
(30) "Mo orboa " mean he ame a ha erm i efine in Sec ion 73-18-2.
(31) "Mo orcyc e" mean every mo or vehic e, o her han a rac or, having a ea or
a e for he u e of he ri er an e igne o rave wi h no more han hree whee in con ac
wi h he groun .
[~~(31)~~] (32) "Office of Recovery Service " mean he Office of Recovery Service ,
crea e in Sec ion 62A-11-102.
(33) "O era e" mean he ame a ha erm i efine in Sec ion 41-1a-102.
[~~(32)~~] (34) (a) "Owner" mean a er on o her han a ien ho er having an in ere in
he ro er y or i e o a vehic e.
(b) "Owner" inc u e a er on en i e o he u e an o e ion of a vehic e ubjec o
a ecuri y in ere in ano her er on bu exc u e a e ee un er a ea e no in en e a ecuri y.
[~~(33)~~] (35) (a) "Priva e a enger carrier" mean any mo or vehic e for hire ha i

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(i) e igne o ran or 15 or fewer a enger , inc u ing he river; an
(ii) o era e o ran or an em oyee of he er on ha hire he mo or vehic e.
(b) "Priva e a enger carrier" oe no inc u e
(i) a axicab;
(ii) a mo or vehic e riven by a ran or a ion ne work river a efine in Sec ion 13-51-102;
(iii) a mo or vehic e riven for ran or a ion ne work ervice a efine in Sec ion 13-51-102; an
(iv) a mo or vehic e riven for a ran or a ion ne work com any a efine in Sec ion

1280 13-51-102 a d regi ered wi h he Divi io of Co umer Pro ec io a de cribed i Sec io
1281 13-51-104.

1282 [~~(34)~~] (36) "Regu ar ide ifica io card" mea a ide ifica io card i ued u der hi
1283 cha er o a er o who e card wa ob ai ed by rovidi g evide ce of awfu re e ce i he
1284 U i ed S a e wi h o e of he docume requireme de cribed i Sub ec io 53-3-804(2)(i)(i).

1285 [~~(35)~~] (37) "Regu ar ice e cer ifica e" mea he evide ce of he rivi ege i ued
1286 u der hi cha er o drive a mo or vehic e who e rivi ege wa ob ai ed by rovidi g evide ce
1287 of awfu re e ce i he U i ed S a e wi h o e of he docume requireme de cribed i
1288 Sub ec io 53-3-205(8)(a)(ii)(A).

1289 [~~(36)~~] (38) "Re ewa " mea o va ida e a ice e cer ifica e o ha i ex ire a a a er
1290 da e.
1291 [~~(37)~~] (39) "Re or ab e vio a io " mea a offe e required o be re or ed o he
1292 divi io a de ermi ed by he divi io a d i c ude ho e offe e agai which oi are
1293 a e ed u der Sec io 53-3-221.

1294 [~~(38)~~] (40) (a) "Re ide " mea a i dividua who
1295 (i) ha e ab i hed a domici e i hi a e, a defi ed i Sec io 41-1a-202, or

1296 regard e of domici e, remai i hi a e for a aggrega e eriod of ix mo h or more
1297 duri g a y ca e dar year;

1298 (ii) e gage i a rade, rofe io , or occu a io i hi a e, or who acce
1299 em oyme i o her ha ea o a work i hi a e, a d who doe o commu e i o he a e;
1300 (iii) dec are him e f o be a re ide of hi a e by ob ai i g a va id U ah driver
1301 ice e cer ifica e or mo or vehic e regi ra io ; or
1302 (iv) dec are him e f a re ide of hi a e o ob ai rivi ege o ordi ari y ex e ded
1303 o o re ide , i c udi g goi g o choo , or aci g chi dre i choo wi hou ayi g
1304 o re ide ui io or fee .
1305 (b) "Re ide " doe o i c ude a y of he fo owi g
1306 (i) a member of he mi i ary, em orari y a io ed i hi a e;
1307 (ii) a ou -of- a e ude , a c a ified by a i i u io of higher educa io ,
1308 regard e of whe her he ude e gage i a y y e of em oyme i hi a e;
1309 (iii) a er o domici ed i a o her a e or cou ry, who i em orari y a ig ed i hi
1310 a e, a ig ed by or re re e i g a em oyer, re igiou or riva e

organiza ion, or a
1311 governmen a en i y; or
1312 (iv) an immedia e fami y member who re ide wi h or a hou eho d member of a er on
1313 i ed in Sub ec ion [~~(38)~~] (40)(b)(i) hrough (iii).
1314 [~~(39)~~] (41) "Revoca ion" mean he ermina ion by ac ion of he divi ion of a icen ee'
1315 rivi ege o drive a mo or vehic e.
1316 [~~(40)~~] (42) (a) "Schoo bu " mean a commercia mo or vehic e u ed o ran or
1317 re- rimary, rimary, or econdary choo uden o and from home and choo , or o and
1318 from choo on ored even .
1319 (b) "Schoo bu " doe no inc ude a bu u ed a a common carrier a defined in Sec ion
1320 59-12-102.
1321 [~~(41)~~] (43) "Su en ion" mean he em orary wi hdrawa by ac ion of he divi ion of a
1322 icen ee' rivi ege o drive a mo or vehic e.
1323 [~~(42)~~] (44) "Taxicab" mean any c a D mo or vehic e ran or ing any number of
1324 a enger for hire and ha i ubjec o a e or federa regu a ion a a axi.

1325 Sec ion 17. Sec ion **53-3-104** i amended o read
1326 **53-3-104. Division duties.**
1327 The divi ion ha
1328 (1) in accordance wi h Ti e 63G, Cha er 3, U ah Admini ra ive Ru emaking Ac ,
1329 make ru e
1330 (a) for examining a ican for a icen e, a nece ary for he afe y and we fare of he
1331 rave ing ub ic;
1332 (b) for acce ab e documen a ion of an a ican ' iden i y, Socia Securi y number,
1333 U ah re iden a u , U ah re idence addre , roof of ega re ence, roof of ci izen hi in he
1334 Uni ed S a e , honorab e or genera di charge from he Uni ed S a e mi i ary, and o her roof
1335 or documen a ion required under hi cha er;
1336 (c) regarding he re ric ion o be im o ed on [~~a er on~~] an individua driving a mo or
1337 vehic e wi h a em orary earner ermi or earner ermi ;
1338 (d) for exem ion from icen ing requiremen a au horized in hi cha er;
1339 (e) e ab i hing rocedure for he orage and main enance of a ican informa ion
1340 rovided in accordance wi h Sec ion 53-3-205, 53-3-410, or 53-3-804; and
1341 (f) o rovide educa iona informa ion o each a ican for a icen e, which
1342 informa ion ha be ba ed on da a rovided by he Divi ion of Air Qua i y, inc uding

(i) wa driver can im rove air qua i ; and
(ii) he harmfu effec of vehic e emi ion ;
(2) examine each a ican according o he c a of icen e a ied for;
(3) icen e mo or vehic e driver ;
(4) fi e ever a ica ion for a icen e received b [~~i~~] he divi ion and ha main ain
indice con aining
(a) a a ica ion denied and he rea on each wa denied;
(b) a a ica ion gran ed; and
(c) he name of ever icen ee who e icen e ha been u ended, di qua ified, or

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revoked b he divi ion and he rea on for he ac ion;
(5) u end, revoke, di qua if , cance , or den an icen e i ued in accordance wi h
hi cha er;
(6) fi e a acciden re or and ab rac of cour record of convic ion received b [~~i~~]
he divi ion under a e aw;
(7) main ain a record of each icen ee howing he icen ee' convic ion and he raffic
acciden in which he icen ee ha been invo ved where a convic ion ha re u ed;
(8) con ider he record of a icen ee u on an a ica ion for renewa of a icen e and a
o her a ro ria e ime ;
(9) earch he icen e fi e , com i e, and furni h a re or on he driving record of an
[~~er on~~] individua icen ed in he a e in accordance wi h Sec ion 53-3-109;
(10) deve o and im emen a record em a required b Sec ion 41-6a-604;
(11) in accordance wi h Sec ion 53G-10-507, e ab i h
(a) rocedure and andard o cer if eacher of driver educa ion c a e o
admini er know edge and ki e ;
(b) minima andard for he e ; and
(c) rocedure o enab e choo di ric o admini er or roce an e for uden
o receive a c a D o era or' icen e;
(12) in accordance wi h Sec ion 53-3-510, e ab i h
(a) rocedure and andard o cer if icen ed in ruc or of commercia driver
raining choo cour e o admini er he ki e ;
(b) minima andard for he e ; and
(c) rocedure o enab e icen ed commercia driver raining choo o admini er or
roce ki e for uden o receive a c a D o era or' icen e;
(13) rovide admini ra ive u or o he Driver Licen e Medica Advi or Board
crea ed in Sec ion 53-3-303;

(14) u o reque by he ieu e a gover or, rovide he ieu e a gover or wi h a

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digi a co y of he driver ice e or ide ifica io card ig a ure of [~~a er o~~] a i dividua

who i a a ica for vo er regi ra io u der Sec io 20A-2-206; a d

(15) i accorda ce wi h Sec io 53-3-407.1, e ab i h

(a) rocedure a d a dard o ice e a commercia driver ice e hird ar y e er or

commercia driver ice e hird ar y exami er o admi i er he commercia driver ice e

ki e ;

(b) mi imum a dard for he commercia driver ice e ki e ; a d

(c) rocedure o e ab e a ice ed commercia driver ice e hird ar y e er or

commercia driver ice e hird ar y exami er o admi i er a commercia driver ice e ki

e for a a ica o receive a commercia driver ice e.

Sec io 18. Sec io **53-3-202** i ame ded o read

53-3-202. Drivers must be licensed -- Violation.

(1) A [~~er o~~] huma driver may o drive a mo or vehic e or a au ocyc e o a

highway i hi a e u e he [~~er o~~] huma driver i

(a) gra ed he rivi ege o o era e a mo or vehic e by bei g ice ed a a driver by he

divi io u der hi cha er;

(b) drivi g a officia U i ed S a e Gover me c a D mo or vehic e wi h a va id

U i ed S a e Gover me driver ermi or ice e for ha y e of vehic e;

(c) (i) drivi g a road ro er, road machi ery, or a y farm rac or or im eme of

hu ba dry em orari y draw , moved, or ro e ed o he highway ; a d

(ii) drivi g he vehic e de cribed i Sub ec io (1)(c)(i) i co ju c io wi h a

co ruc io or agricu ura ac ivi y;

(d) a o re ide who i a ea 16 year of age a d you ger ha 18 year of age who

ha i he o re ide ' immedia e o e io a va id ice e cer ifica e i ued o he

o re ide i he o re ide ' home a e or cou ry a d i drivi g i he c a or c a e

ide ified o he home a e ice e cer ifica e, exce ho e er o referred o i Par 6,

Driver ' Lice e Com ac , of hi cha er;

(e) a o re ide who i a ea 18 year of age a d who ha i he o re ide '

immedia e o e io a va id ice e cer ifica e i ued o he o re ide i he o re ide '

home a e or cou ry if drivi g i he c a or c a e ide ified o he home a e ice e

cer ifica e, e ce ho e er on referred o in Par 6, Driver ' Licen e Com ac , of hi cha er;

(f) driving under a earner ermi in accordance wi h Sec ion 53-3-210.5;

(g) driving wi h a em orary icen e cer ifica e i ued in accordance wi h Sec ion 53-3-207; or

(h) e em under Ti e 41, Cha er 22, Off-Highway Vehic e .

[~~(2) A er on may no drive or, whi e wi hin he a enger com ar men of a mo or vehic e, e erci e any degree or form of hy ica con ro of a mo or vehic e being owed by a mo or vehic e u on a highway un e he er on~~]

(2) A human driver may no drive a mo or vehic e or erform a era or ongi udina vehic e mo ion con ro for a vehic e being owed by ano her mo or vehic e u on a highway un e he human driver

(a) [~~ho d a va id icen e i ued under hi cha er for~~] i icen ed under hi cha er o drive a mo or vehic e of he y e or c a of mo or vehic e being owed; or

(b) i e em ed under ei her Sub ec ion (1)(b) or (1)(c).

(3) (a) A [~~er on~~] human driver may no drive a mo or vehic e a a a icab on a highway of hi a e un e he er on ha a va id c a D driver icen e i ued by he divi ion .

(b) A [~~er on~~] human driver may no drive a mo or vehic e a a riva e a enger carrier on a highway of hi a e un e he [~~er on~~] human driver ha

(i) a a icab endor emen i ued by he divi ion on he [~~er on'~~] human driver' icen e cer ifica e; or

(ii) a commercia driver icen e wi h

(A) a a icab endor emen ;

(B) a a enger endor emen ; or

(C) a choo bu endor emen .

(c) No hing in Sub ec ion (3)(b) i in ended o e em a [~~er on~~] human driver driving a mo or vehic e a a riva e a enger carrier from regu a ion under o her a u ory and regu a ory cheme , inc uding

(i) 49 C.F.R. Par 350-399, Federa Mo or Carrier Safe y Regu a ion ;

(ii) Ti e 34, Cha er 36, Tran or a ion of Worker , and ru e ado ed by he Labor Commi ion in accordance wi h Ti e 63G, Cha er 3, U ah Admini ra ive Ru emaking Ac ;

and

(iii) Ti e 72, Cha er 9, Mo or Carrier Safe y Ac , and ru e ado ed by he Mo or Carrier Divi ion in accordance wi h Ti e 63G, Cha er 3, U ah

Admini a ive Ru emaking
Ac .
(4) (a) Exce a ovided in Sub ec ion (4)(b), (c), (d), and (e), a [~~e on~~] human
d ive may no o e a e
(i) a mo o cyc e un e he [~~e on~~] human d ive ha a va id c a D d ive icen e and
a mo o cyc e endo emen i ued unde hi cha e ;
(ii) a ee ega a - e ain vehic e un e he [~~e on~~] human d ive ha a va id c a D
d ive icen e; o
(iii) a mo o -d iven cyc e un e he [~~e on~~] human d ive ha a va id c a D d ive
icen e and a mo o cyc e endo emen i ued unde hi cha e .
(b) A [~~e on~~] human d ive o e a ing a mo ed, a defined in Sec ion 41-6a-102, i no
equi ed o have a mo o cyc e endo emen i ued unde hi cha e .
(c) [~~A e on~~] An individua o e a ing an e ec ic a i ed bicyc e, a defined in
Sec ion 41-6a-102, i no equi ed o have a va id c a D d ive icen e o a mo o cyc e
endo emen i ued unde hi cha e .
(d) [~~A e on~~] An individua i no equi ed o have a va id c a D d ive icen e if he
e on i
(i) o e a ing a mo o a i ed coo e , a defined in Sec ion 41-6a-102, in acco dance
wi h Sec ion 41-6a-1115; o

(ii) o e a ing an e ec ic e ona a i ive mobi i y device, a defined in Sec ion
41-6a-102, in acco dance wi h Sec ion 41-6a-1116.
(e) A [~~e on~~] human d ive o e a ing an au ocyc e i no equi ed o have a
mo o cyc e endo emen i ued unde hi cha e .
(5) An au oma ed d iving y em a defined in Sec ion 41-26-102.1 i no equi ed o
have a d ive icen e.
[~~(5)~~] (6) A e on who vio a e hi ec ion i gui y of an inf ac ion.
Sec ion 19. **Repealer.**
Thi bi e ea
Sec ion **41-26-102, Autonomous motor vehicle study.**

You may print the text of a bill from the PDF version located on the 'Bill Text' tab above.

State Senate

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Telephone: (801) 538-1408
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Contact a Senator

House of Representatives

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APPENDIX B – TECHNICAL MEMORANDUM # 2

ALAKSA DOT&PF
CONNECTED & AUTOMATED VEHICLE STRATEGIC PLAN

TECH MEMO #2

Date:	July 16, 2021	Project #: 25686
To:	Carolyn Morehouse, P.E. and Anna Bosin, P.E. DOT&PF	
From:	Andrew Ooms, P.E., Claire Dougherty, Rachel Grosso, and Abby Morgan, Ph.D., P.E.,	
Project:	Alaska Connected and Automated Vehicle Strategic Plan	
Subject:	CAV Readiness Gaps and Needs Analysis	

PROJECT INTRODUCTION

The Alaska Department of Transportation and Public Facilities (DOT&PF) is preparing for the future by developing a connected and automated vehicle (CAV) strategic plan. The scope of this assessment is focused on connected and automated vehicles on Alaska roads and highways as well as on supporting highway infrastructure.

This technical memorandum (Tech Memo #2) summarizes the state's existing readiness and identifies specific gaps and needs, which will aid in the development of a *CAV Strategic Plan* that addresses those gaps and challenges to adoption based on feedback from key stakeholders and technical advisors.

CONTENTS

ALASKA CAV ACTIONS TO DATE

Alaska DOT&PF has taken several actions to date to ready the state for CAVs. This chapter describes those actions, which include establishing a CAV Working Group, developing Intelligent Transportation System (ITS) Plans, and working on Alaska Iways projects.

CAV Working Group

Established by the DOT&PF Commissioner in cooperation with the Municipality of Anchorage, metropolitan planning organizations (MPOs), and other state agencies, the Alaska CAV team (referred to as the CAV working group) meets quarterly and is comprised of representatives from numerous state and partner agencies and industry, including:

- Department of Commerce, Community and Economic Development
- Department of Natural Resources
- Department of Motor Vehicles
- Alaska Trucking Association
- Federal Highway Administration (FHWA)
- Anchorage Metropolitan Area Transportation Solutions (AMATS)
- Fairbanks Area Surface Transportation (FAST) Planning
- Municipality of Anchorage (MOA)
- DOT&PF representation from:
    - Statewide and regional planning and engineering
    - Statewide research
    - Statewide electrical engineer
    - Statewide ROW

The CAV working group charter was approved in November 2019 and defines the mission, scope, responsibility, membership, and administration. The charter is included for reference as **Appendix A**. Of note, the Vision/Mission statement is as follows:

> *The CAV Team will foster a collaborative statewide planning effort for the purpose of preparing the State of Alaska for the use of Connected and Autonomous vehicles in Alaska. Facilitating the implementation of Connected and Autonomous Vehicle use in Alaska through all levels of state and local government and throughout the private and non-profit sector will ensure smart, efficient investment in Alaska highway infrastructure.*

Responsibilities of the CAV working group are defined as:

1. *Prepare, manage, and update a Strategic Framework that includes timelines, resources, and goals and identifies implementation actions.*
2. *Select and champion specific CAV efforts from the strategic framework.*

3. *Review and recommend department agreements engaging with third parties on pilot studies or other partnering opportunities.*
4. *Identify and champion national best practices, assuring that Alaska is following industry standards and best value investments.*

Intelligent Transportation Systems (ITS) Plans

CAVs are supported by ITS infrastructure, which can include sensors, telecommunications equipment (such as fiber optic networks, DSRC, or 5G), and data analytics equipment and software. Alaska-specific ITS plans include:

- *Alaska Iways Architecture Update: Implementation Plan (2017)*[1]
- *Alaska Iways Architecture Update: Seward Highway Corridor ITS Plan (2008)*[2]
- *Alaska Iways Architecture Update: Glenn Highway Corridor ITS Plan (2008)*[3]

The *Alaska Iways Architecture Update: Implementation Plan* identified ITS projects in the 2016–2019 Statewide Transportation Improvement Program (STIP) and suggested additional ITS strategies for implementation. Programmed projects in the 2016–2019 STIP represented near-term projects slated to be deployed in the next 3 years. ITS-related projects included in 2016–2019 STIP were:

- Road Weather Information System (RWIS) network funding
- 3rd Gen 511 traveler information system funding
- Further development of the Geographic Information System (GIS) system
- GIS-Enabled Highway Crash System
- Roadway Data Collection, Traffic Data Management, and Reporting System
- Iways Architecture updates
- Weigh-In-Motion (WIM) maintenance and operations
- Northern Region Signal improvements, including improved communication and monitoring capabilities
- Highway Data Equipment acquisition and installation

Table 1 summarizes the additional ITS strategies identified for potential implementation and the status of some projects as of July 2021.

[1] DOT&PF (2017). *Alaska IWAYS Architecture Update: Implementation Plan.* http://iways.alaska.gov/Documents/AKIA_ImpPlanUpdate_FINAL.pdf
[2] DOT&PF (2008). *Alaska Iways Architecture Update: Seward Highway Corridor ITS Plan.* http://iways.alaska.gov/Documents/Seward_Highway_Corridor_ITS_Plan.pdf
[3] DOT&PF (2008). *Alaska Iways Architecture Update: Glenn Highway Corridor ITS Plan.* http://iways.alaska.gov/Documents/Glenn_Highway_Corridor_ITS_Plan.pdf

Table 1 Alaska Iways ITS Infrastructure Potential Projects (2016–2019)

Strategy	Time Horizon	Priority	Status
Camera Images	Near (Anchorage)	Low/Medium	☑
Transportation Operations Center	Virtual – Medium Building – Long	Medium	
Third-Party Data to Traffic Management	Near	Medium	
Railroad Work Schedules	Near	Medium	
Maintenance and Construction Plans / Feedback	Medium	Medium	
Road Weather Data Archive	Medium	Medium	☑
CVIEW Subset (ADOT Instance) Update	Long	Low	
Credential Information (Federal Motor Carrier – MSCVE)	Near/Medium	Medium/Low	
Border Crossing Information	Long	Low	Canadian 511 Links and COVID Links Implemented
Route Restrictions (Superload into 511)	Near	Medium	Weight Restrictions Layer to be added to 511
Connection 511 Internal – Motor Carriers	Long	Medium	
ITS Software Upgrade	Near/Medium	Medium	Currently Under Contract – To be Complete in 12 Months
Avalanche Detection System	Near	High	
EMS Dispatch – 511 Internal Reporting	Medium	Medium	
Law Enforcement Dispatch – 511 Internal Reporting	Medium	Medium	Public Alerts Sent
3rd Party Information Services	Near	High	
Transit and Ferry Information on 511	Long	Low	Transit included in Route Navigation and Ferries are Linked
Traffic Images on the 511 Website	Near	High	☑
Data Archive			511 and RWIS Archive Operational, Waze Archive in Progress

Ongoing IWAYS Projects

Recent and ongoing Iways[4] efforts as of 2021 include:

Alaska 511 Traveler Information System – Providing travelers real-time weather and condition reports along the road system, including livestream camera and video feeds, accessible via phone, website, apps, and social media.

Online Vessel Tracking System – The Alaska Marine Highway System (AMHS) has developed an online vessel tracking system to display real-time vessel arrival and departure information for passenger planning purposes.

Alaska Land Mobile Radio (ALMR) – The State of Alaska operates the ALMR in partnership with other federal, state, and local emergency response agencies. DOT&PF maintenance and operations crews use handheld and vehicle mounted ALMR radios for daily operations and emergency response. Radio signals are relayed by repeater stations located throughout the state highway system.

Automated Vehicle Identification (AVI) Screening – DOT&PF, in partnership with the Division of Measurement Standards and Commercial Vehicles Enforcement (MSCVE) and the Federal Motor Carrier Safety Administration (FMCSA), has installed an AVI screening system on the Glenn Highway north of Anchorage. The AVI system utilizes mast-arm antennas, roadside cameras, and in-vehicle transponders to verify the credentials of participating commercial truck operators.

Portable Message Boards (PMBs) – DOT&PF maintenance personnel use PMBs along Alaska's remote highways to inform travelers in areas with limited cell phone coverage of upcoming hazards. Through existing phone lines or cell phone modems, the messages can be updated in real time from the maintenance stations through a PMB software that links to the 511 Travel Information System.

Road Weather Information System (RWIS) Network – Includes data stations along the state's major transportation corridors, with real-time data available via an online map. Data collected includes atmospheric information, precipitation accumulation, and in some locations, camera feeds and pavement surface and subsurface temperature observations. A current RWIS network map is displayed in **Figure 2**.

Smart Snowblower/Snowplow – The use of GPS- and radar-based systems on snow-removal vehicles to aid in navigation and collision avoidance, particularly in challenging winter mountain pass conditions. The project has been successfully deployed and is operational in the Thompson Pass on the Richardson Highway.

Traffic Management Center (TMC) Remote Access – DOT&PF staff have access to traffic signal controllers and traffic camera feeds enabling live tracking of conditions, equipment diagnostics, and signal timing adjustment. These capabilities are essential for efficient management of equipment spanning hundreds of road miles.

[4] DOT&PF. http://iways.alaska.gov/projects.shtml

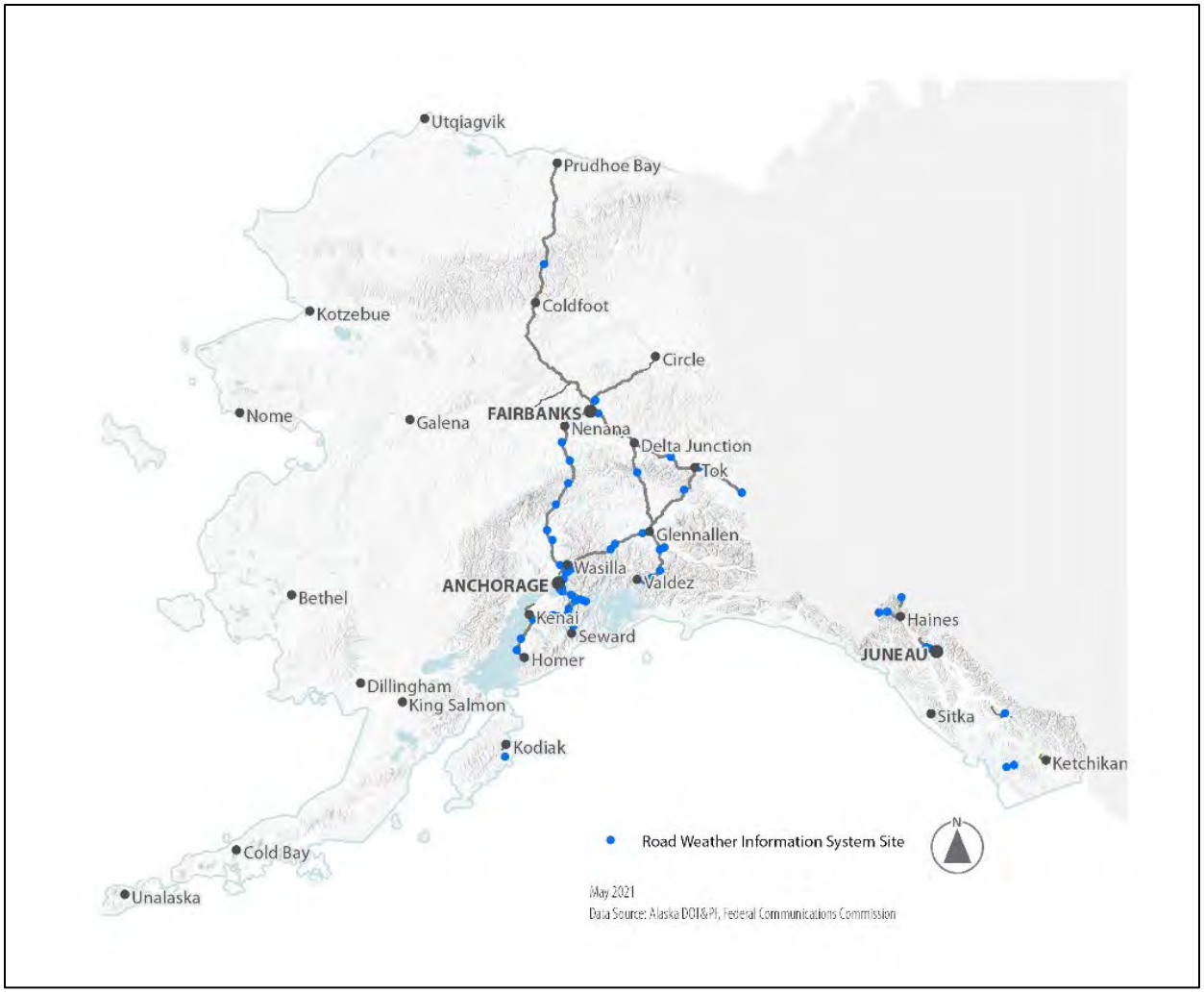


Figure 1. Road Weather Information System Network (RWIS)

Additional ITS Efforts

Additional ongoing ITS-related pilots include cloud-based Automated Traffic Signal Performance Measures (ATSPM) and cloud-based Adaptive Signal Technology, which could have the potential to evolve into signal timing based on vehicle-to-infrastructure (V2I) information. DOT&PF is currently working with Econolite to provide ATSPM capabilities to approximately 50 signalized intersections on the Parks Highway in Wasilla and on the Glenn Highway in Palmer, with the goal of improving detection capabilities and evaluating signal performance measures.

ALASKA CAV READINESS

In October 2020, the University of Alaska Anchorage (UAA) prepared for DOT&PF a research report titled *Self-Evaluation and Readiness of Alaska DOT&PF on Deployment of Connected and Automated (CAV) on Alaska Roads*[5], concluding that "***Alaska is at an early stage of CAV readiness***" based on the USDOT Transportation Systems Management and Operations (TSMO)/CAV Capability Maturity Model framework.

Existing challenges and needs in furthering CAV readiness in Alaska based on the research report, industry survey documentation, and a follow-up discussion with the research team lead include:

- Limited funds for projects or for staff training opportunities
- Lack of specific expertise in CAV technologies
- Shortage of dedicated resources and staff availability
- Data sharing, security, and privacy concerns
- Finding the right technology that will work in Alaska's climate and with existing infrastructure

The CAV readiness research report identified a pilot project as the next step forward, which would give the DOT&PF the opportunity to learn directly about the impacts new technologies will have on local communities and what unique challenges and solutions are needed to fit CAVs into the existing roadway infrastructure and travel demands.

Alaska DOT&PF is a self-described follower of proven technology. An initial DOT&PF-led pilot would likely implement what has been proven to work elsewhere and expand on existing technologies. As such, specific pilot opportunities may be:

- Deployment of smart intersection technologies, including data/video collection and processing or evolution of signal timing based on V2I information in the future
- Expansion of the RWIS network/capabilities
- Expansion of the 511 system using social media and crowdsourced data for two-way communications
- Vendor-lead expertise/training for DOT staff

DETAILED GAP ANALYSIS BY SUBJECT AREA

This chapter provides a detailed gap analysis of CAV preparation actions in Alaska, organized by four key subject areas:

- Implementation Framework
- Core Infrastructure
- Legislative Action
- Funding Plan

[5] DOT&PF (2020). *Self-Evaluation and Readiness of Alaska DOT&PF on Deployment of Connected and Automated (CAV) on Alaska Roads*.

IMPLEMENTATION FRAMEWORK

This section summarizes implementation best practices to facilitate the effectiveness of the CAV working group, integrate CAV working group efforts into related policy and planning efforts, and maximize opportunities to learn from other working groups and educate the public.

Cross-Agency and Industry Coordination

States leading the charge in preparing for CAVs have formed working groups that emphasize participation and collaboration with other agencies, industry, and university planning partners. DOT&PF should continue engaging with other state and local agencies that may be impacted by CAV technologies such as:

- Department of Motor Vehicles
- Department of Administration
- Department of Commerce, Community and Economic Development
- Department of Law
- Department of Public Safety
- Department of Natural Resources
- University of Alaska
- Metropolitan Planning Organizations (MPOs)
- Freight Industry
    - The movement of freight to and throughout Alaska is a strong economic driver and several pilot studies nationwide are evaluating how to improve operational safety and efficiencies of freight movement with AV technologies.
- Other state CAV Working Groups, particularly those pursuing the testing of technologies particularly applicable to Alaska, such as Minnesota (cold climate pilot testing) and Iowa (rural pilot testing)

Should the size and composition of the Alaska CAV working group fluctuate over time, the group could consider organizing into focused subcommittees, similar to larger CAV technical groups in other states. These smaller subcommittees could tackle specific initiatives and regularly report back to the larger CAV working group. Specific focus areas might include:

- Communications, Outreach & Education
- Infrastructure Readiness
- Economic Development
- Policy & Legislation
- Industry Outreach and Partnerships
- Public Safety & Enforcement
- Freight Coordination

Additionally, considering the potential significant changes in future mobility posed by CAVs, the CAV working group **should work with partner agencies and departments to ensure that CAV technology considerations are incorporated into future planning and policy documents**, such as long-range plans, capital plans, regional plans, modal plans, freight plans, and safety plans.

Policy Changes in Preparation for CAVs

Examples of policy changes that respond to recent and anticipated technologies include:

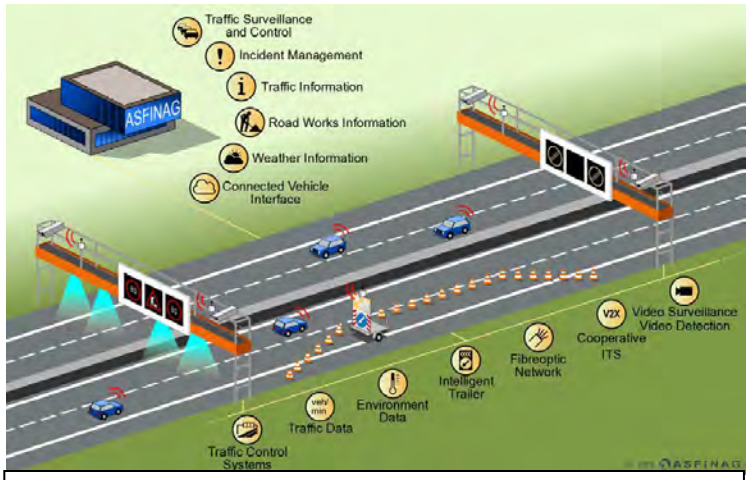
- Incorporating CAV and other emerging technology considerations into project funding processes and land development applications. Strengthening development impact fees as a revenue source for projects that are aligned with guiding principles.
- Specific to more urbanized areas:
  - Establishing robust curbside management program with data collection for evaluation of space utilization and demand.
  - Implementing demand-based parking management programs in addition to the proliferation of designated Pick-Up/Drop-Off (PUDO) Zones to accommodate increasing trip share from ridehail and rideshare vehicles.

Public Engagement and Education

Public engagement and education can ease technology transitions and diffuse opposition, particularly around pilot programs, which can introduce skeptical populations to CAV technology in a gradual, temporary, and controlled manner. **The Alaska CAV working group should research or develop educational outreach resources on CAV technologies to engage with the local community, to ease in public understanding and acceptance during the planning phase of future technology pilot deployments.** In general, Alaskans are concerned by data privacy and security. By sharing the potential benefits of CAV technologies and pilots with the public, policy makers, and industry, data privacy and security concerns can be addressed head-on. DOT&PF could require consultants to provide engagement and education materials as part of the planning phases of future pilots.

CORE INFRASTRUCTURE

The Alaska CAV readiness research report prepared by UAA indicates that Alaska's areas of weakness in transportation technologies are most apparent in both office-based and field-deployed systems and technology. This section discusses the crucial infrastructure elements necessary to support the safe and efficient deployment of CAVs through in-depth assessments of the physical and digital infrastructure of roadways, telecommunication networks, and power provision, with special attention to the state of the practice in Alaska.



Connected Vehicle Infrastructure Components

Source: ASFiNAG, Austria

Roadways: Physical & Digital Infrastructure

As CAVs progress and market penetration increases, agencies will need to invest in operating and maintaining both physical and digital infrastructure to ensure safe and efficient implementation. Physical improvements could include pavement, structures, signing, and striping. Digital infrastructure investments could include traffic sensors, data servers, and communications equipment (transmitters,

message signs, websites). This section outlines components of the physical and digital infrastructure that are particularly relevant to CAVs.

A. Signing & Striping

Striping and signage maintenance is challenging in Alaska. Pavement markings are not visible several months of the year in many areas due to snow- and ice-covered roadways. Advanced driver assistance systems (ADAS), such as lane keeping assist, are available as standard features on some vehicles today, but their effectiveness is hindered when the system cannot function as designed due to covered lane markings. Regardless of whether a human or automated system is performing the driving task, the quality of pavement markings and the adequate placement of signs (both static and dynamic) are crucial components of safe infrastructure. The Alaska CAV readiness research report noted the difficulty that such maintenance requires and commented on how other colder climate states, such as Michigan and Indiana, are currently working with their university and manufacturing partners to use technology and data analysis to better inform maintenance. One example of this emerges from Purdue University, where Professor Darcy Bullock's research team is using dashboard-mounted cameras and GPS-tracking to record data on where and when lane-keep features deactivate due to work zones or worn striping.[6]

B. High-Resolution Reference Systems

Building from the previous examples, high-resolution reference systems are also critical components of the digital infrastructure necessary to support the operation of CAVs, which depend on precise location to continuously move and monitor conditions. Georeferenced location data (referred to as 'MAP') of intersections support automated driving in urban environments. Using permanent, short-range communications systems to emit local reference points will be crucial in areas with limited cellular connectivity, such as remote areas, mountain passes, or tunnels.[7] High-resolution mapping is also incredibly important in locations with variable weather conditions, such as heavy snowfall, that can obfuscate much of the physical roadway infrastructure. Finnish AV firm *Sensible*[4] is currently piloting their reference system-based software suite, titled *Dawn*, in the snowy Finnish Muonio area of the Arctic to create AV algorithms that can handle all-weather driving tasks.[8] The University of Iowa, with AV firm AutonomouStuff, is also working on this issue through their Automated Driving Systems for Rural America program, where they are testing a fully-ADA compliant automated shuttle for rural passenger service. Crucial for the pilot's implementation is the creation of "high-definition maps of the shuttle's 47-mile route."[9]

[6] Bullock, Darcy (October 2019). *What your car knows can make the roads safer – and pave the way for connected and autonomous vehicles.* https://medium.com/purdue-engineering/what-your-car-knows-can-make-the-roads-safer-and-pave-the-way-for-connected-and-autonomous-430f679d5f63

[7] Carreras, Anna & Erhart, Jacqueline (September 2018). *Road infrastructure support levels for automated driving*. 25th ITS World Congress. https://www.researchgate.net/profile/Jacqueline-Erhart/publication/339353309_Road_infrastructure_support_levels_for_automated_driving/links/5f6899ef92851c14bc8be2c8/Road-infrastructure-support-levels-for-automated-driving.pdf

[8] Sauliala, Tuomas (December 2020). *Sensible 4 is Testing the Early Version of Autonomous Driving Software 'Dawn' in Finnish Laplands.* https://sensible4.fi/2020/12/08/sensible-4-is-testing-the-early-version-of-autonomous-driving-software-dawn-in-finnish-lapland/

[9] King, Maraya (January 2021). *Creating an Automated Shuttle for America's Backroads.* Adapt Automotive. https://www.adaptautomotive.com/articles/877-creating-an-automated-shuttle-for-americas-backroads

C. Real-time Traffic Sensors

The deployment of traffic sensors to detect volume, speed, weather, work zones, and other events can further advance the AV system with layers of dynamic information on temporary changes. Real-time traffic sensors, connected to traffic management centers through cellular networks or fiber optic networks, will be crucial to performing macro-operations such as truck platooning and variable speed limits while also improving micro-operations, or the individual user experience through detailed and timely traveler information. **This potential use of 5G is complemented by DOT&PF's partnership with Econolite to deploy automated traffic signal performance measures and possibly other implementable solutions that can be phased in as funding becomes available.** Eventually, a project similar to the Wyoming Connected Vehicle Pilot could be feasible for Alaska. Currently, Wyoming DOT is utilizing vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communications along a 402-mile stretch of I-80 such that drivers and vehicles are able to share and receive alerts, advisories, and real-time road conditions. The project goal of improving the safety, mobility, and productivity of travelers along this freight corridor with extreme weather and challenging travel conditions could help to solve similar seasonal travel challenges throughout Alaska.

Lastly, in urban conditions, interacting with traffic signals is and will continue to be an important driving task. Original equipment manufacturers (OEMs) of vehicles and traffic signals have been working to develop a communications dialogue for content and applications. This dialogue has developed to include both signal phasing and timing messages (SPaT) as well as geo-referenced location data (referred to as MAP). Connected vehicles can use these messages to determine what speed to travel at, where to stop, where to accelerate, the location of other vehicles, the type of intersection, and other crucial information for driving tasks.[10] Recently, the Connected Vehicle Pooled Fund Study, a collection of states funding add advanced transportation research, released a guidance document for the preparation of MAP with recommendations for development, implementation, and maintenance.[11]

D. Cyber Security & Data Management

The multitude of data which is provided and exchanged between ITS infrastructure and vehicles poses a significant cyber security challenge, as well as a hefty data management task, for transportation agencies. The transportation sector is particularly vulnerable to cyber-attacks, partially due to the inherent dependence on technology—as reported in the *Transportation Systems Sector-Specific Plan* published by the U.S. Department of Homeland Security and the U.S. Department of Transportation, this vulnerability is due to the "...growing reliance on cyber-based control, navigation, tracking, positioning and communications systems, as well as the ease with which malicious actors can exploit cyber systems serving transportation."[12] As demonstrated by recent cyber-attacks on state DOTs such as Texas and Colorado, cyber security is tantamount to deploying a connected and automated future.[13,14] *NCHRP*

[10] Ayoub, Nader, PE (2017). *Traffic signals and connected vehicles.* Iteris. https://static.tti.tamu.edu/conferences/ttc17/presentations/session-c/ayoub.pdf

[11] University of Virginia (April 2021). *Creation of a Guidance Document for MAP Preparation.* The Connected Vehicle Pooled Fund Study.

[12] USDOT & DHS (2015). *Transportation Systems Sector-Specific Plan.* Cybersecurity & Infrastructure Security Agency. https://www.cisa.gov/sites/default/files/publications/nipp-ssp-transportation-systems-2015-508.pdf

[13] Ropek, Lucas (May 2020). Cyberattack Disrupts Texas Department of Transportation. GovTech. https://www.govtech.com/security/cyberattack-disrupts-texas-department-of-transportation.html

[14] USDOT (2019). Colorado DOT offers lessons learned after recovering from two 2018 ransomware attacks. Intelligent Transportation Systems Joint Program Office. https://www.itskrs.its.dot.gov/its/benecost.nsf/ID/182bf1869996a8578525838c0070b645

Report 930: Update of Security 101: A Physical Security and Cybersecurity Primer for Transportation Agencies, offers agencies an in-depth look at how to prepare for and prevent cyber security threats.[15] Additionally, the Federal Business Council is hosting a DOT Cybersecurity Symposium in October 2021 to train government staff in cyber security situational awareness and risk management.[16]

The FHWA defines data management as "the discipline that establishes the criteria and requirements for data; their quality, management, policies, business process; and risk management for handling of data within [the agency]. In short, it is a corporate approach to collecting and managing data."[17] These management practices are important, as noted in the Alaska CAV readiness research report, for "while the implementation of communications networks is often straight-forward, anticipating data storage and server needs for agencies is challenging." And as CAVs and other emerging technologies produce more data, analyzing, managing, and storing that data will increase in importance. *NCHRP Report 952: Guidebook for Managing Data from Emerging Technologies for Transportation* offers a series of best practices, through a framework of big data management, for agencies to begin to navigate this task.[18]

As data management and cyber security practices continue to evolve, it is imperative for the safety and security of the transportation system—particularly with CAVs—that DOT&PF invest in training and resources for staff in these areas.

E. Roadway Summary

Readying Alaska's infrastructure for CAVs will include **ongoing maintenance of the physical infrastructure**, such as signage, striping, and pavement conditions. It will also include **expanding the digital infrastructure of information and data sharing, mapping, monitoring, and storing**. Agencies must continue to **upgrade the traffic signal infrastructure** as well as the digital connections between signal controllers, traffic management centers, and eventually vehicles and other infrastructure. Partnerships between agencies, academia, and the private industry can strengthen technology planning, deployments, and evaluation. **Equipping staff with the knowledge, tools, and resources to securely manage large quantities of data will be important for building a foundation for CAVs**. Emerging technology applications in transportation are evolving rapidly, and while specific infrastructure needs, timelines, and impacts are uncertain, there are clear foundational actions that DOT&PF and its planning partners can implement to prepare for the high-tech road ahead. **In order to be nimble, DOT&PF must continue to work with its planning and technology partners to apply technology solutions in a flexible manner that allows for uncertainty in timeline and implementation challenges**. **Appendix B** details a framework for identifying fine-grained CAV infrastructure readiness, which could be used as a tool to guide the implementation of technologies in a rapidly evolving technology landscape.

[15] Countermeasures Assessment & Security Experts, LLC and Western Management and Consulting, LLC. (2020). *NCHRP Report 930: Update of Security 101: A Physical Security and Cybersecurity Primer for Transportation Agencies*. National Academies of Sciences, Engineering, and Medicine. http://nap.edu/25554

[16] Federal Business Council (October 2021). *Department of Transportation (DOT) Cybersecurity Symposium*. https://www.fbcinc.com/event.aspx/Q6UJ9A01AYR1

[17] Federal Highway Administration (July 2015). *Data Governance Plan: Volume 1 – Data Governance Primer*. https://www.fhwa.dot.gov/datagov/dgpvolume%201.pdf

[18] Pecheux, K., Pecheux, B., Ledbetter, C., & Lambert, C. (2020). *NCHRP Report 952: Guidebook for Managing Data from Emerging Technologies for Transportation*. National Academies of Sciences, Engineering, and Medicine. http://nap.edu/25844

Telecommunications

As the most critical infrastructure in an increasingly digital world, internet service provision through fiber optic networks, cellular networks and satellite internet can enable rural and urban areas alike to reap the benefits of connectivity. As the Internet of Things (IoT) continues to expand to include more objects and applications, the data exchange needs continue to increase as well, leading to an increasing demand for internet connectivity. This section will explore how telecommunications have evolved into a critical component of the transportation system by providing the ability to navigate, communicate, enforce, monitor, and warn system users. It is important to note that the Alaska CAV readiness research report indicates that at present, DOT&PF's networks "are appropriate for today's traffic and there is a clear path forward as more bandwidth is needed. [However], lack of fiber is not expected to be a constraint, [as] 5G is a likely substitute technology."

A. Cellular Networks

Alaska's cellular network is served by multiple telecommunications providers, including national providers such as AT&T Mobility and Verizon Wireless as well as companies local to Alaska, including:

- The Arctic Slope Telephone Association Cooperative
- Bristol Bay Cellular Partnership
- Copper Valley Telecom
- Cordova Wireless
- GCI Wireless
- Ketchikan Public Utilities
- OTZ Cellular
- TelAlaska Cellular

As further detailed in **Appendix C**, **telecommunications infrastructure upgrades across the state are needed to transition networks to current 4G LTE and 5G technologies** and to **expand existing cellular network coverage outside of urbanized areas.** **Figure 3** displays the existing cellular network in Alaska, most of which, outside of the urbanized areas of Anchorage, Fairbanks, and Juneau, is currently supported by 2G and 3G networks. Telecommunications infrastructure upgrades across the state are needed to transition networks to current 4G LTE and 5G technologies and to expand existing cellular network coverage outside of urbanized areas and along major roadways.

Figure 2. Alaska Cellular Communications Coverage

B. Fiber Optic Networks

Fiber optic networks support a broad range of internet data applications and are increasingly important for building secure intelligent transportation systems. As of 2019, fiber optic networks have supported connected vehicle deployments in Virginia, New York, Florida, Michigan, Arizona, South Carolina, and Utah for applications ranging from weather systems, collision warning systems, curve speed compliance, pedestrian warning systems, queue warning systems, signal phasing and timing, transit signal priority, and other safety systems.[19] In addition to these applications, fiber optic networks often provide the infrastructure backbone for enhancing cellular networks, like 4G LTE and 5G, which have even more connected vehicle applications.[20] **High-speed, low-latency communication is vital for the safe and efficient implementation of CAVs.**

[19] Khan, Sakib Mahmud (August 2019). *Connected and Automated Vehicles in Urban Transportation Cyber-Physical Systems.* Clemson University. https://tigerprints.clemson.edu/cgi/viewcontent.cgi?article=3479&context=all_dissertations
[20] Lazaro et al. (2018). *5G Connected Vehicles Supported by Optical Fiber Access.* International Conference on Transparent Optical Networks. https://zaguan.unizar.es/record/79623/files/texto_completo.pdf

Alaska is connected to the global fiber optic network via submarine and terrestrial connections. **Appendix D** includes additional background information on the existing fiber optic network in Alaska.

As communication technologies continue to advance, their applications in transportation will grow in importance. **For Alaska, these developments mean continuing to invest in fiber optic communications to support the application of cellular networks such as 5G and beyond as well as intelligent transportation systems.** For example, DOT&PF could adopt a 'Dig Once' Policy, wherein any roadway improvement project would coordinate with a telecommunications provider to install sub-surface fiber conduit to avoid reconstructing and repaving roadways for telecommunications upgrades.

C. Satellite Internet

Satellite internet, a means of providing internet connectivity primarily in rural areas, has been commercially available since 2003 and has gained traction in the past decade as a viable method for creating a "space-based internet backbone" through constellations of satellites with inter-satellite laser communications.[21] Throughout the 2010s, industry-leading technology companies such as ViaStat, HughesNet, SpaceX, Amazon, and OneWeb have launched satellites equipped with telecommunications capabilities to provide internet access; some notable customers include airlines such as JetBlue, United, American, and Quantas. Local to Alaska, Starlink, a subsidiary of SpaceX, has launched 1,625 low Earth orbit satellites between 44–52 degrees north, with public beta internet service provision beginning in October 2020.[22] Starlink plans to add 30,000 satellites to Earth's orbit by the end of 2022 with the goal of providing near-global internet access.[23] In terms of connected transportation applications, there is growing consensus that satellite internet can and will be a part of the global telecommunications infrastructure supporting intelligent transportation systems.[24]

Power

A resilient, renewably powered power grid is crucial to both powering CAVs—many of which are developing as electric vehicles (EVs)—and the infrastructure that supports them. CAV-supportive infrastructure, such as ITS equipment like roadside units, traffic sensors, weather stations, and telecommunications equipment, require a secure and resilient power source to maintain their operations. While much of this equipment can operate with solar panels, light obstructions and extreme daylight shifts can pose a significant challenge for providing continuous connectivity. Without the ability to transmit and receive data from ITS equipment, CAVs cannot fully perform driving tasks and will likely falter. **Working with utility service providers, especially near major roadways, to ensure continuous energy supply to ITS equipment will be integral to the safe and reliable deployment of CAVs in Alaska.**

Two technological transformations are occurring simultaneously in the automotive industry: the development of AVs and the rise of EVs. As the auto industry, governments, and consumers seek more efficient, less expensive, and safer vehicles, the technologies that support AVs and EVs are growing

[21] Mosher, Dave (February 2018). *Elon Musk is about to launch the first of 11,925 proposed SpaceX internet satellites — more than all spacecraft that orbit Earth today*. Business Insider. https://www.businessinsider.com/spacex-starlink-microsat-launch-global-internet-2018-2?r=US&IR=T

[22] Tung, Liam (July 2020). *SpaceX Starlink internet-beaming satellite service takes next step for beta test*. ZDNet. https://www.zdnet.com/article/spacex-starlink-internet-beaming-satellite-service-takes-next-step-for-beta-test/

[23] Henry, Caleb (October 2019). *SpaceX submits paperwork for 30,000 more Starlink satellites.* Space News. https://spacenews.com/spacex-submits-paperwork-for-30000-more-starlink-satellites/

[24] EMEA Satellite Operators Association (2017). *Internet of Things (IoT) and the Role of Satellites*. ESOA. https://www.esoa.net/cms-data/positions/1695%20ESOA%20IOT%20%20Sat%20Brochure%20Proof%204.pdf

closely intertwined. The concurrence of EVs and AVs is demonstrated by the AV pilots across the U.S. utilizing battery EVs, such as General Motor's AV subsidiary Cruise that operates with the Chevy Bolt, Alphabet's Waymo that utilizes Jaguar I-Paces, and the entire Tesla fleet equipped with Autopilot.[25] While the auto industry has cited concerns about co-developing the two technologies due to the energy required to power the AV sensor systems reducing the EV's range to an uncompetitive distance, researchers at Carnegie Mellon University recently determined through a vehicle dynamics-based model that electric power can supply enough energy for an AV without a significant decrease in range, although drag from protruding sensors presents a possible detriment.[26]

Appendix E includes additional background information on the existing power network and electric vehicles in Alaska. As these technologies increase market share, Alaska must prepare for the increased demands of electric vehicle charging in addition to preparing roadways for CAVs. The Alaska Electric Vehicle Working Group (AEVWG), under the Alaska Energy Authority, is dedicated to smart and efficient electric transportation development in Alaska. As electric and automated vehicles continued to develop simultaneously, the project team recommends that the **CAV Working Group and the Alaska Electric Vehicle Working Group host joint meetings to share knowledge and information, prioritize siting, administer maintenance & operations responsibilities, and pursue grant opportunities**. Charging infrastructure, as well as a resilient electricity grid, will be integral aspects of the successful deployment of CAVs in Alaska.

LEGISLATIVE ACTION

The National Highway Traffic Safety Administration (NHTSA) is responsible for developing policy on automated driving system (ADS) safety performance, while state governments are responsible for developing policy on licensing, registration, enforcement, liability, and insurance requirements for ADS. To date, the State of Alaska has taken no specific legislative or executive action to prepare for CAVs beyond the establishment of the CAV Working Group in 2019 by the DOT&PF Commissioner.

Rulemaking Guidance

As discussed in Tech Memo #1, *Survey of Best Practices in Early CAV Implementation*, more than 30 states have enacted legislation or issued governors executive order related to automated vehicles as of 2021, with many states modeling their rulemaking efforts after recommendations published by the American Association of Motor Vehicles Administration (AAMVA) in the *Jurisdictional Guidelines for the Safe Testing and Deployment of Highly Automated Vehicles*. Though not required of states, AAMVA provides guidance to agencies planning for AVs relating to:

- Administrative Consideration
- Driver Licensing
- Vehicle Credentialing
- Law Enforcement

Common elements addressed via legislation or governor executive order in states that have pursued CAV-related rulemaking efforts to date include:

[25] Marshall, Aarian (July 2020). *The Intersection Between Self-Driving Cars and Electric Cars.* Wired. https://www.wired.com/story/intersection-self-driving-cars-electric/

[26] Mohan, Sripad, & Viswanathan (July 2020). *The Electric Future of Autonomous Vehicles.* Nature Energy – Carnegie Mellon University. https://www.cmu.edu/news/stories/archives/2020/july/electric-autonomous-vehicles.html

- Legal definition of AV technologies
- Clarification on applicable of truck following distances/platooning technologies
- Specific licensure, registration, and insurance requirements
- Policies and procedures for testing and regulating CAV deployments
    - Note that state and local agencies do not have authority to regulate CAV performance. State and local agencies can regulate the deployer/operator's performance, but not the vehicle itself (only NHTSA has authority to do this).
- Prevention of local authorities from prohibiting CAV use
- Recommendation or requirement that representation of the disabled community be involved in AV programs, pilots, or task forces

Review of Alaska Administrative Code

The current Alaska Administrative Code (ACC)[27] was reviewed to identify potential legislation gaps and needs focused on the following guiding questions:

1. *What barriers to CAV technologies are present in the AAC?*
2. *What code elements are missing that other states have incorporated?*
3. *What else is in the AAC that might relevant?*

A. Potential Code Barriers

Existing AAC code sections that, without clarification related to AV technologies and operators, may pose future barriers to AV technology testing and implementation include:

- **2 AAC 90. Driver Licensing and Safety Responsibility**
    - Safety Responsibility (2 AAC 90.100 - 2 AAC 90.150)
    - Standards for Licensing of Drivers (2 AAC 90.400 - 2 AAC 90.490)
    - Mandatory Auto Insurance (2 AAC 90.510 - 2 AAC 90.540)

    Clarity will be needed on licensing, insurance, and safety responsibility for CAV applications.
- **2 AAC 92. Vehicle Registration, Title and Transfer** (2 AAC 92.005 - 2 AAC 92.990)
- **13 AAC. Division of Alaska State Troopers**
    - Chapter 02 Motor Vehicle and Driving Offenses: Rules of the Road
        - Following too closely (13 AAC 02.090)

          "A driver of a motor vehicle may not follow another vehicle more closely than is reasonable and prudent and at least two seconds behind the vehicle being followed, having regard for the traffic upon the roadway and the condition of the roadway."

          This existing code may hinder the testing of purposeful AV platooning (V2V) technologies.

[27] Alaska Administrative Code, 32nd Legislature (2021-2022) http://www.legis.state.ak.us/basis/aac.asp

- Chapter 03 Commercial Motor Vehicle and Driving Offenses: Rules of the Road
  - Following too closely (13 AAC 03.090)

    "A driver of a motor vehicle may not follow another vehicle more closely than is reasonable and prudent and at least two seconds behind the vehicle being followed, having regard for the traffic upon the roadway and the condition of the roadway."

    This existing code may hinder the testing of purposeful AV platooning technologies – Some states, like Florida, with ongoing truck platooning studies have added clarification that such requirements are not applicable if appropriate platooning (V2V) AV technologies are engaged.
- Chapter 04 Motor Vehicle and Driving Offenses: Vehicle Equipment and Inspection
- Chapter 05 Commercial Motor Vehicles

- **17 AAC Transportation and Public Facilities**
  - Chapter 25. Operations, Wheeled Vehicles
    - Motor Vehicles Size and Weight
    - Commercial Motor Vehicle: Safety and Hazardous Materials (2 AAC 25.200-25.250)

Additionally, several chapters of **Alaska Statute 28 – Motor Vehicles**[28] that may hinder implementation of AV technologies without clarification are as follows:

- AS 28.10 Vehicle Registration, Lien and Title
- AS 28.15 Drivers' Licenses
- AS 28.20 Motor Vehicle Safety Responsibility Act
- AS 28.22 Mandatory Motor Vehicle Insurance
- AS 29.32 Commercial Motor Vehicle Safety Citations
- AS 28.33 Commercial Motor Vehicles
- AS 28.35 Offenses and Accidents

B. Missing Code Elements

Beyond further evaluating existing code limitations as relate to the testing or implementation of AV technologies, vehicles, and supporting infrastructure, **code additions** that would provide additional clarity on AV technologies and potential avenues for future AV pilot testing based on pioneering efforts in other states would be:

- Adding specific definitions of AV technologies that may challenge conventional driver and vehicle definitions. Examples include:
  - 'Automated driving system'
  - 'Dynamic driving task'
  - 'Fully autonomous vehicle'

[28] Alaska Statutes 2020 http://www.legis.state.ak.us/basis/statutes.asp#01

  - 'System equipped vehicle'
  - 'Driver-assistive truck platooning technology'
- Creating exemptions for persons operating fully autonomous motor vehicles from the requirement to hold a driver's license and clarification on vehicle insurance requirements for fully autonomous motor vehicles.
- Outlining specific policies, processes, and procedures for pursuing approval and/or exceptions to standardize Alaska regulation of AV technology pilot testing. Examples include:
  - Requiring operators to submit a testing plan for review and approval prior to testing operations.
  - Specifying which state agency entity is responsible for reviewing and approving operator testing plans and operations.
- Clarifying State authority in governing AV technologies as relate to vehicle credentialing, licensing, insurance, and operations, and preempting duplicative or conflict locality action.
- Codifying the Alaska CAV working group for longevity and continued engagement as administrations change and technologies evolve.

C. Other Code Considerations

In addition to specific code chapter revisions or additions relating to defining and regulation AV technologies, further rulemaking efforts modeled off efforts by other state bodies include:

- Requirement that there be representatives of disadvantaged communities involved in AV programs, pilots, and the CAV working group, reflecting that AV technologies could be deployed first in fleet models serving as mobility on demand, and may specifically benefit members of rural communities, the elderly, those with disabilities, and low-income communities.
- Addressing data privacy and security concerns as they relate to AV technologies, in coordination with the Department of Commerce, Community and Economic Development and legislature.

FUNDING PLAN

Progressing the implementation of CAVs in Alaska will require a dedicated funding source for technology projects or inclusion of technology projects in state funding programs. FDOT's CAV Business Plan highlighted the creation of a dedicated funding source for transportation technology projects as a key action for implementing emerging technologies—DOT&PF could take a similar approach. Public-private partnerships (PPP) could create alternative funding means for projects. Other key areas to highlight for funding regarding CAVs are the recruitment development and training of staff to work with advanced transportation technologies.

DOT&PF Funding Mechanism

While available funding is limited, CAV-related pilot projects could pursue funding through existing DOT&PF funding programs, such as the Highway Safety Improvement Program (HSIP) if a safety benefit can be shown or the Statewide Transportation Improvement Program (STIP). Realistically, the limited available funding is likely to be utilized to maximize current initiatives (such as RWIS, 511).

Another key agency costs area to highlight for funding regarding CAVs are the recruitment, development, and training of staff to work with advanced transportation technologies.

Private Sector Involvement

To address funding deficits, some states have challenged the private industry to present new technologies, applications, and business plans that the state can support in various ways. For example, the state of Michigan created the Michigan Mobility Challenge, which spurred forty proposal submittals for various emerging technology applications. Similarly, Maryland includes many representatives from the private industry on their working group subcommittees to continue building public-private partnerships. This collaboration between government and industry has served to spur local context-sensitive technology applications that states can confidently invest—mutually benefitting agencies, companies, and their communities.

Funding Opportunities

As reported in the UAA self-assessment, funding was the second-most cited barrier to implementing CAVs in Alaska. Additionally, grants are available from a variety of federal agencies for the various aspects of the infrastructure to support advancing emerging technologies, as further detailed in **Appendix F**.

NEEDS ASSESSMENT – ALASKA CAV SWOT SUMMARY

Considering the Alaska CAV readiness research, CAV working group charter, and member feedback to date as well as the state of existing infrastructure and other best practice state actions, the CAV strategic gaps and needs analysis has been organized into the below strengths, weakness, threats, and opportunities (SWOT) chart.

Strengths	Weaknesses
▶ CAV working group has been formed ▶ CAV working group plans to regularly review and update the forthcoming Strategic Plan framework, which will be critical to ensuring it reflects evolving technologies, department priorities and current opportunities ▶ Alaska maintains strong working relations with ITS/traffic signal private industry partners	▶ Lack of a CAV vision and supporting goals ▶ Lack of dedicated funding for CAV planning, projects, and staff training ▶ Lack of clear legislative direction ▶ Lack of local CAV research center or cutting edge industry partner presence ▶ Lack of CAV cybersecurity plan
Opportunities	**Threats**
▶ Continue learning from other States ▶ Focused investment in proven technologies ▶ Maximize current initiatives (SPaT, RWIS, 511) ▶ Stay in-the-know on and support related technology initiatives such as EVs in Alaska ▶ As the CAV working group grows, organize into focused subcommittees ▶ Emphasize inexpensive learning opportunities such as TRB, Automated Road Transportation Symposium, Consumer Electronics Showcase ▶ Partner with private industry to provide training to agency employees ▶ Leverage existing DOT&PF outreach platforms to engage with the public ▶ Work with agency partners to add CAV technology considerations into future planning and policy documents ▶ Challenge industry to demonstrate potential project benefits and partner to share costs of pilots ▶ Prioritize freight industry partnerships and existing infrastructure to find opportunities to support freight-focused pilot efforts	▶ Legislative inaction ▶ Conflicting local guidance ▶ Public opposition ▶ Data privacy and security concerns ▶ Pace of technology development speeds obsolescence of built infrastructure ▶ Stay flexible with technology infrastructure investments and beware of proprietary technologies

NEXT STEPS

In the next step for this project, the research team will engage with the Alaska CAV working group and project technical advisors to discuss the identified gaps and needs to develop a draft and final *CAV Strategic Plan* to guide the CAV working group member and DOT&PF actions forward.

FOR MORE INFORMATION

The following appendices provide additional information:

- Appendix A: Alaska CAV Working Group Charter
- Appendix B: CAV Infrastructure Readiness Assessment
- Appendix C: Cellular Network Background Information
- Appendix D: Alaska Fiber Optic Network Background Information
- Appendix E: Alaska Power Network and Electric Vehicle Background Information
- Appendix F: Funding Opportunities

APPENDIX A

ALASKA CAV WORKING GROUP CHARTER

State of Alaska
Alaska Department of Transportation and Public Facilities
State Connected and Autonomous Vehicle Charter

Connected and Autonomous Vehicles (CAV) present opportunities and challenges to Alaska. CAV is a transformative technology that will change Alaska's transportation system. This charter allows the State of Alaska to better prepare for the future. The purpose of the charter is to organize a CAV Team to lead the State in implementing the state's transportation vision as it relates to CAV. This Team will coordinate across the State's various agencies to plan for CAV and manage vision and investment.

The CAV Team is responsible for keeping up-to-date with developments in the CAV field and preparing the State of Alaska on critical CAV investment decisions. CAV will affect the way that the State's Department and outside agencies relate to each other. The CAV Team will:

1. Prepare, Manage and Update a Strategic Framework that includes timelines, resources and goals and identifies implementation actions.
2. Select and champion specific CAV efforts from the strategic framework.
3. Review and recommend department agreements engaging with third parties on pilot studies or other partnering opportunities.
4. Identify and champion national best practices, assuring that Alaska is following industry standards and best value investments.

Authority
Alaska Department of Transportation and Public Facilities (DOT&PF) Commissioner, in cooperation with Municipality of Anchorage, Metropolitan Planning Organizations and other State agencies, hereby creates this Team. The Team is responsible for developing a work plan for each agency's approval. The Team has the authority to set agenda items within the work plan and may establish sub-committees to carry out its work plan. In many cases the actual authority may reside within a particular business area, but the Team will evaluate and issue recommendations regarding those investments.

Membership
See attachment A. Attachment A may be changed with the vote of the Team and a copy provided to this charter's signatories.

Purpose
This Charter establishes Alaska's Connected and Autonomous Vehicles Team and defines its mission, scope and responsibility, membership, and administration.

Vision/Mission
The CAV Team will foster a collaborative statewide planning effort for the purpose of preparing the State of Alaska for the use of Connected and Autonomous vehicles in Alaska. Facilitating the implementation of Connected and Autonomous Vehicles use in Alaska through all levels of state and local government and throughout the private and non-profit sector will ensure smart, efficient investment in Alaska's highway infrastructure.

Scope and Responsibility
The CAV Team shall provide multi-disciplinary expertise to help guide and monitor successful CAV deployment in Alaska. The objectives and duties of the Team shall be to identify and recommend ways to ensure that Alaska responds to key issues and challenges. The Team will regularly update the State Transportation Innovation Council (STIC) led by DOT&PF.

Roles

Leadership - The Team lead is appointed by the DOT&PF Commissioner and represents executive leadership as the Chair. This member will cast a vote only when the membership results in a tie.

Facilitator - The facilitator is appointed by the DOT&PF Commissioner and organizes meetings and coordinates knowledge transfer. The facilitator tallies votes and keeps track of participation. This is a non-voting member.

Members - The Team's voting membership includes representation from a variety of agencies and functions.

Resource - Key division representatives that are invited to every meeting and receive all agenda's and materials and are encouraged to participate fully in discussions and consensus-building. Resource members do not vote.

Responsibilities

- Members, or their proxies, must attend all meetings.
- Make decisions that are in the best interest of the State of Alaska.
- Support decisions made by the Team through its work plan, actions and resources.

Work Plan

The Team will fulfill a work plan that is developed collaboratively and is adopted by consensus. The work plan identifies decisions, issues and initiatives under consideration by the Team, along with the responsible Team member, current status and anticipated completion date for each.

Meetings

The Team will determine the frequency, not less than quarterly. A majority of voting members must attend the meetings to establish a quorum. Agendas and meeting materials will be provided by the facilitator at least 5 days before the meetings.

The rotation of membership will occur as best fits the needs of their respective organizations. Rotations will generally occur through events such as retirement, changes in employment and career changes, or at the request of the respective organizations.

Meeting attendance may be in person or any two-way, interactive communications means, such as conference call or video conference.

This Charter has been approved by:

11.8.19

John MacKinnon — Date
Commissioner, DOT&PF Commissioner

Amanda Price 11/12/19

Amanda Price — Date
Commissioner, Department of Public Safety

K Tshibaka 11-12-19

Kelly Tshibaka — Date
Commissioner, Department of Administration

Craig Lyon — Date
Anchorage Metropolitan Area Transportation Solutions

11-15-2019

Jackson Fox — Date
Fairbanks Area Surface Transportation

William Falsey — Date
Municipal Manager Municipality of Anchorage

APPENDIX A: Team Members

Member Name	Role	Representing
Carolyn Morehouse	Chair	
Vacant	Team Facilitator	DOT&PF Intelligence Transportation Systems
Joseph Michel	Team Member	Alaska Trucking Association
SJamie Acton	Team Member	MOA Public Transportation Director
Leon Morgan	Team Member	Department of Public Safety
Dave Donley	Team Member	Department of Administration Division of Motor Vehicles
Anna Bosin	Team Member	DOT&PF SW Research/State Transportation Innovation Council Liaison
Craig Lyon	Team Member	Anchorage Metropolitan Area Transportation Solutions
Jackson Fox	Team Member	Fairbanks Area Surface Transportation
Val Rader	Resource	DOT&PF CR Traffic Design
Margret Carpenter	Resource	DOT&PF NR CMAQ Planner
John Crapps	Resource	MOA Traffic Signals
Jason Jacobs	Resource	DOT&PF NR M&O
Steven Thater	Resource	DOT&PF SCR Traffic Design
Kathleen Graber	Resource	FHWA AK Division Office
Meadow Bailey	Resource	DOT&PF Communication CR PIO
Jeff Carleton	Resource	DOT&PF CR Electrical Engineer
Vivian Underwood	Resource	Anchorage Metropolitan Area Transportation Solutions

APPENDIX B

ROADWAY CAV INFRASTRUCTURE READINESS ASSESSMENT

In 2018, an Austrian and Spanish research team created a framework for understanding the readiness of a road at the segment-level to support CAVs.[29] The five levels of infrastructure support for automated driving (ISA), is an approach similar to the traffic operations 'level of service' metric, with Level E representing low readiness and Level A representing high readiness, as described in **Figure 4**. As readiness increases, more of the physical and digital infrastructure detailed in the previous sections are present and working in harmony. **Figure 5** displays an example segment with ISA applied. This framework could be helpful as a method for performing fine-grain CAV assessments.

	Level	Name	Description	Digital information provided to AVs			
				Digital map with static road signs	VMS, warnings, incidents, weather	Microscopic traffic situation	Guidance: speed, gap, lane advice
Conventional infrastructure	E	Conventional infrastructure / no AV support	Conventional infrastructure without digital information. AVs need to recognise road geometry and road signs.				
	D	Static digital information / Map support	Digital map data is available with static road signs. Map data could be complemented by physical reference points (landmarks signs). Traffic lights, short term road works and VMS need to be recognized by AVs.	X			
Digital infrastructure	C	Dynamic digital information	All dynamic and static infrastructure information is available in digital form and can be provided to AVs.	X	X		
	B	Cooperative perception	Infrastructure is capable of perceiving microscopic traffic situations and providing this data to AVs in real-time.	X	X	X	
	A	Cooperative driving	Based on the real-time information on vehicle movements, the infrastructure is able to guide AVs (groups of vehicles or single vehicles) in order to optimize the overall traffic flow.	X	X	X	X

Figure 3. Infrastructure Support for Automated Driving (ISA) Framework

Source: Carreras & Erhart, 2018.

[29] Carreras, Anna & Erhart, Jacqueline (September 2018). *Road infrastructure support levels for automated driving*. 25th ITS World Congress. https://www.researchgate.net/profile/Jacqueline-Erhart/publication/339353309_Road_infrastructure_support_levels_for_automated_driving/links/5f6899ef92851c14bc8be2c8/Road-infrastructure-support-levels-for-automated-driving.pdf

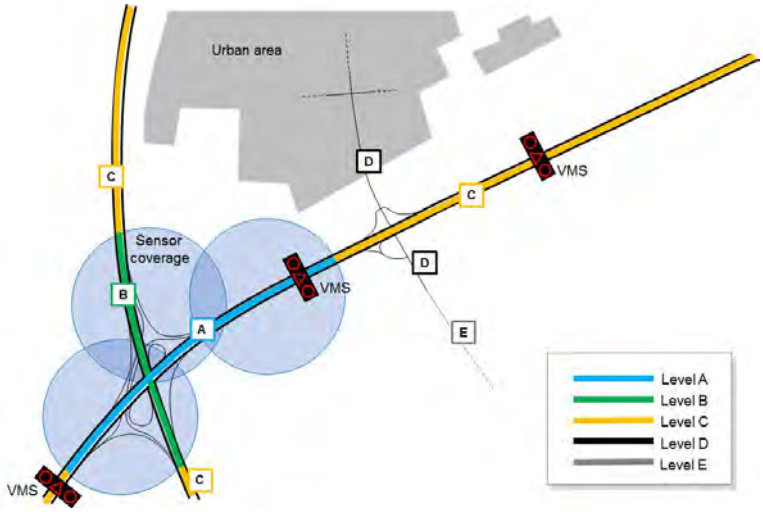


Figure 4. Example Roadway Segment by ISA

Source: Carreras & Erhart, 2018.

APPENDIX C

ALASKA CELLULAR NETWORK BACKGROUND INFORMATION

Alaska's cellular network is served by multiple telecommunications providers, including industry leaders AT&T Mobility and Verizon Wireless, as well as companies local to Alaska, such as:

- The Arctic Slope Telephone Association Cooperative
- Bristol Bay Cellular Partnership
- Copper Valley Telecom
- Cordova Wireless
- GCI Wireless
- Ketchikan Public Utilities
- OTZ Cellular
- TelAlaska Cellular

All of these cellular providers offer Long-Term Evolution (LTE) wireless broadband communication for mobile devices and data terminals, which is the current industry standard in its fourth generation (4G), first debuted in the early 2010s. However, since 2019, fifth generation standards for broadband cellular networks, or 5G, have commenced implementation around the world, including the United States and Canada. The 5G network will increase available bandwidth, which in turn allows for faster download speeds, projected to reach 10 gigabits per second at full buildout.[30] The increased speeds will empower the connectivity of the Internet of Things, which includes transportation technologies such as the partial support of CAVs.[31]

Since June 2019, GCI has been working to upgrade existing infrastructure to support 5G in Anchorage.[32] However, telecommunication industry experts do not expect to be able to support fully connected and automated vehicles and other IoT applications with 5G due to the speed and capacity requirements necessary to support the volume of connected devices (as of 2020, there were 26 billion internet-connected devices globally, a figure that is projected to double by 2030).[33]

To meet the demands of the myriad applications of ultra-high-speed connectivity, telecommunications researchers are currently creating technologies that will eventually comprise the sixth generation cellular data network. 6G, which will operate on the terahertz spectrum, will support secure ultra-reliable low-latency communications, with a peak data rate of 1 terabit per second (for reference there are 8,000 gigabits in a terabit), which will be necessary for full support of CAVs.

However, as these new network technologies become available, previous versions—including 2G, 3G, and eventually 4G LTE—will become obsolete, and the technology will "sunset," meaning the industry will agree upon a date in which the technology will be retired in order for the spectrum that the network

[30] De Looper, Christian (March 2020). *What is 5G? The next-generation network explained.* Digital Trends. https://www.digitaltrends.com/mobile/what-is-5g/
[31] Hoffman, Chris (January 2019). *What is 5G, and how fast will it be?* How-To Geek. https://web.archive.org/web/20190124041504/https://www.howtogeek.com/340002/what-is-5g-and-how-fast-will-it-be/
[32] Early, Wesley (June 2019). *Alaska's first wireless 5G network to be built in Anchorage.* Alaska Public Media via Eye on the Arctic. https://www.rcinet.ca/eye-on-the-arctic/2019/06/19/alaska-5g-network-gci-internet-anchorage/
[33] Shaukat, Aalyia (March 2021). *5G vs. 6G: What is it and when will it be here?* Electronics 360: Critical Communications. https://electronics360.globalspec.com/article/16447/5g-vs-6g-what-is-it-and-when-will-it-be-here

operates on to be reused for the newer technologies as they roll out. In the US, most providers have recently ended their 2G operations and are working toward sunsetting their 3G networks by 2022. While 4G LTE networks will likely continue providing service until at least 2030, the fifth and sixth generation technologies are expected to eclipse 4G LTE service by 2040, coinciding with projected CAV adoption scenarios.[34]

[34] Remmert, Harald (June 2020). *2G, 3G, 4G LTE Network Shutdown Updates.* Digi International. https://www.digi.com/blog/post/2g-3g-4g-lte-network-shutdown-updates

APPENDIX D

ALASKA FIBER OPTIC NETWORK BACKGROUND INFORMATION

The Matanuska Telephone Association (MTA) completed the first terrestrial connection between Alaska and the Lower 48 in May 2020, with the construction of a 280-mile conduit-laying project along the Richardson Highway. This linked North Pole and Fairbanks, among other municipalities, with a 200-mile Canadian fiber cable spur constructed by Northwestel for a total of 480 miles of fiber optic cabling.[35,36] Quintillion is in the process of constructing a submarine fiber optic cable from Asia to Europe via the Northwest Passage.[37] This three-phased project includes a terrestrial cable between Fairbanks and Prudhoe Bay along 500 miles of the Dalton Highway in addition to the 360 miles of fiber cabling between Anchorage and Fairbanks, owned by GCI. Additionally, a number of submarine cables connect Alaska with the continental US, which are delineated in **Table 1**. While these infrastructure investments are significant, there are many additional components necessary to ensure the secure and efficient functioning of these systems.

As communication technologies continue to advance, their applications in transportation will grow in importance. For Alaska, these developments mean continuing to invest in fiber optic communications to support the application of cellular networks such as 5G and beyond as well as intelligent transportation systems.

Table 2. Submarine Fiber Optic Cables in Alaska

Title	Owner/Operator	Length (mi)	Landing Points
Alaska United West (AU-West)	GCI	1,545	Seward, Warrenton, OR
Alaska United East (AU-East)	GCI	2,330	Juneau, Valdez, Whittier, Lynnwood, WA
Alaska United Southeast (AU-SE)	GCI	390	Angoon, Hawk Inlet, Petersburg, Sitka, Wrangell
Kodiak Kenai Fiber Link (KKFL)	GCI	600	Anchorage, Homer, Kenai, Kodiak, Narrow Cape, Seward,
Terra Southwest	GCI	N/A	Fish Camp, Homer, Iguigig, Illiamna, Kokhanok, Newhalen, Nondalton, Pedro Bay, Pile Bay, Port Alworth, Williamsport
Alaska United Aleutian	GCI	815	Akutan, Chignik Bay, Chignik Lagoon, Chignik Lake, Cold Bay, False Pass, King Cove, Kodiak, Larsen Bay, Perryville, Sand Point, Unalaska
Alaska United Turnagain Arm	GCI	30	McHugh Point, Portage
NorthStar	Alaska Communications	2,005	Valdez, Whittier, Lena Point, Hillsboro, OR
ACS Alaska-Oregon Network (AKORN)	Alaska Communications	1,865	Anchorage, Homer, Nikiski, Florence, OR

[35] Finley, Klint (May 2019). *Alaska Will Finally Get Its Own Terrestrial Fiber-Optic Line*. Wired. https://www.wired.com/story/alaska-finally-get-own-fiber-optic-line/

[36] Brooks, James (May 2020). *Overland Fiber-Optic Cable Joins Alaska to the Lower 48.* Alaska Dispatch News via GovTech. https://www.govtech.com/network/overland-fiber-optic-cable-joins-alaska-to-the-lower-48.html

[37] Qui, Winston (December 2017). *Quintillion Activates Arctic Subsea Cable*. Submarine Networks. https://www.submarinenetworks.com/en/systems/asia-europe-africa/arctic-fiber/quintillion-activates-arctic-subsea-cable

SEALink	Alaska Power & Telephone Company	215	Coffman Cove, Lena Point, Petersburg
Lynn Canal	Alaska Power & Telephone Company	85	Haines, Lena Point, Skagway
KetchCan1	Ketchikan Public Utilities	105	Ketchikan, Prince Rupert, Canada
Quintillion Subsea Cable Network	Quintillion	1,180	Kotzebue, Nome, Point Hope, Prudhoe Bay, Utiqiagvik, Wainwright

Source: TeleGeography Submarine Cable Map by HMN Technologies: https://www.submarinecablemap.com/#/

APPENDIX E

ALASKA POWER NETWORK AND ELECTRIC VEHICLE BACKGROUND INFORMATION

ALASKA'S POWER NETWORKS

The oil and natural gas industries are a key part of Alaska's economy, with seven of the country's largest oil fields located in the state.[38] Alaska's total energy demand is among the ten lowest states (due to a smaller population). However, the state's per capita energy consumption is the fourth highest in the nation—after Wyoming, Louisiana, and North Dakota—due to the harsh winters, energy-intensive oil and gas industries, and the small population.[39] In 2019, natural gas fueled 44% of Alaska's total utility-scale electricity generation and hydroelectric power generated 27%. Petroleum liquids accounted for 15%, coal was 11%, and other renewables—mostly wind and biomass—accounted for 3% of Alaska's generation.[40] Electricity infrastructure in Alaska is, for the most part, only found within a grid system called the Railbelt that serves the corridor between Fairbanks, Anchorage, and the Kenai Peninsula.[41] Although the Railbelt serves roughly two-thirds of Alaska's population, electricity retail prices in the state's rural areas can be three to five times higher than the rates in the urban areas.[42] With more than 150 islanded, stand-alone electrical grids serving rural villages, over 90% of Alaskans receive electricity from either a cooperative or a municipal utility provider.[43,44]

ELECTRIC VEHICLES IN ALASKA

Electric vehicles (EVs) are projected to comprise 18% of the global market share by 2030, with over 400 new models projected to be unveiled by 2023.[45,46] Alaska must prepare for the increased demands of electric vehicle charging in addition to preparing roadways for CAVs. The Alaska Electric Vehicle Working Group (AEVWG), under the Alaska Energy Authority, is dedicated to smart and efficient electric transportation development in Alaska.

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[38] U.S. Energy Information Administration (March 2015). *Top 100 U.S. Oil & Gas Fields*. https://www.eia.gov/state/analysis.php?sid=AK#85

[39] U.S. Energy Information Administration (2018). *Alaska State Energy Data System: Primary Energy Consumption Estimates & Total Energy Consumption Estimates.* https://www.eia.gov/state/analysis.php?sid=AK#85

[40] U.S. Energy Information Administration (2019). *Electricity Data Browser, Net generation for all sectors, annual, Alaska, 2016-19.* https://www.eia.gov/state/analysis.php?sid=AK#85

[41] Alaska Center for Energy and Power (December 2020). *Alaska Energy Wiki, Railbelt*. Via U.S. Energy Information Administration. https://www.eia.gov/state/analysis.php?sid=AK#85

[42] The Alaska State Legislature (2010). *Enrolled HB 306: Declaring a state energy policy.* Via U.S. Energy Information Administration. https://www.eia.gov/state/analysis.php?sid=AK#85

[43] Renewable Energy Alaska Project (2021). *Alaska's Energy Infrastructure.* https://alaskarenewableenergy.org/ppf/alaskas-energy-infrastructure/

[44] Alaska Power Association (2021). *About Alaska Power*. https://alaskapower.org/

[45] Winton, Neil (March 2021). *Electric Cars are Coming and If You Don't Like it, Tough.* Forbes. https://www.forbes.com/sites/neilwinton/2021/03/09/electric-cars-are-coming-and-if-you-dont-like-it-tough/?sh=77981a6698fe

[46] Murphy, Mike (August 202). *2023 is supposed to be the year of the electric vehicle – Now is the time to invest.* Protocol. https://www.protocol.com/electric-vehicle-revolution-time-to-invest

Funded through the VW Diesel Emissions Settlement, the AEVWG is working toward developing an EV charging network with fast-charging stations every 100 miles along the primary Railbelt transportation corridor while also increasing community-based charging stations. By 2023, the AEVWG is aiming to increase statewide total EV charging infrastructure to 59 Level 2 chargers, 30 Level 3 chargers, and 2 energy storage units.[47] **Figure 6** displays the currently available charging infrastructure for electric vehicles in Alaska and Western Canada.

Figure 5. Alaska & Western Canada EV Charging Infrastructure

[47] Alaska Energy Authority (October 2020). *Alaska Electric Vehicle Working Group Charter.* http://www.akenergyauthority.org/Portals/0/2020_10_13%20AKEVWG%20Charter.pdf

APPENDIX F

FUNDING OPPORTUNITIES

The following section outlines potential funding sources for the various aspects of the infrastructure to support advancing emerging technologies.

High-Speed Internet Access and Telecommunications

- Distance Learning and Telemedicine Grant, Department of Agriculture
  - The Distance Learning and Telemedicine program helps rural communities use the unique capabilities of telecommunications to connect to each other and to the world, overcoming the effects of remoteness and low population density. For example, this program can link teachers and medical service providers in one area to students and patients in another. The Distance Learning and Telemedicine program helps rural residents tap into the enormous potential of modern telecommunications and the Internet for education and health care, two of the keys to economic and community development.
  - Grant funds may be used for the acquisition of eligible capital assets (broadband facilities, AV equipment, terminal/data terminal equipment, computer hardware/network components/software, indoor wiring, and similar infrastructure), the acquisition of instructional programming, and the acquisition of technical assistance and instruction for using eligible equipment.
- Community Connect Grant, Department of Agriculture
  - The purpose of the Community Connect Program is to provide financial assistance in the form of grants to eligible applicants that will provide, on a "community-oriented connectivity" basis, broadband service that fosters economic growth and delivers enhanced educational, health care, and public safety benefits. The Community Connect delivers financial assistance to eligible applicants that will provide broadband service in rural, economically challenged communities where service does not exist. The Community Connect program helps rural communities extend access where broadband service is least likely to be commercially available, but where it can also most make a difference in the quality of life for people and businesses. The projects funded by these grants help rural residents tap into the enormous potential of the Internet for jobs, education, healthcare, public safety, and community development.
- Smart and Connected Communities Program, National Science Foundation, Division of Computer and Network Systems
  - Communities in the United States are entering a new era of transformation in which residents and their surrounding environments are increasingly connected through rapidly changing intelligent technologies. This transformation offers great promise for improved wellbeing and prosperity but poses significant challenges at the complex intersection of technology and society. The goal of the NSF Smart and Connected Communities (S&CC) program solicitation is to accelerate the creation of the scientific

and engineering foundations that will enable smart and connected communities to bring about new levels of economic opportunity and growth, safety and security, health and wellness, accessibility and inclusivity, and overall quality of life.

  - Awards in this category are for capacity building to prepare project teams to propose future well-developed SCC-IRG proposals. Each of these awards will provide support for a period of one year and may be requested at a level not to exceed $150,000 for the total budget.

- Telecommunications Infrastructure Loans and Guarantees, Department of Agriculture
  - This program provides financing for the construction, maintenance, improvement and expansion of telephone service and broadband in rural areas, which are defined as places with a population of 5,000 or less, areas without telecommunications facilities, or areas where the applicant is the recognized telecommunications provider.
- Infrastructure State Revolving Fund (ISRF) Program – Infrastructure and Economic Development Bank
  - The purpose of the ISRF is to provide low-cost public financing to state and local government entities for public infrastructure and economic expansion projects for a maximum of 30 years. Projects financed by ISRF include vital projects for the community, including street repair and upgrades, power and communication facilities, public transit, etc. Eligible costs for financing include rights of way, easements and interests acquired or used, cost of machinery and equipment, reserves for improvements, etc.
  - IBank offers technical support, legal assistance and loan officers support throughout the program application and approval process.

Connected & Automated Vehicles

- Connected Vehicle Equipment Loan Program, US Department of Transportation
  - The Equipment Loan Program can help to reduce the cost of a temporary deployment by borrowing equipment for testing and demonstration.
- Energy Efficient Mobility Systems (EEMS) Program, Department of Energy, Office of Energy Efficiency & Renewable Energy and Vehicle Technologies Office
  - EEMS supports research and development that investigates how disruptive forces such as automated, connected, electric and/or shared (ACES) vehicles will impact energy consumption in transportation. It also helps communities determine how they can plan for and encourage energy efficiency increases in mobility. DOT&PF might partner with the EEMS program to become a pilot site for the deployment of ACES.
  - The Vehicle Technologies Office (VTO) supports high impact projects that can significantly advance its mission to develop more energy efficient and environmentally friendly highway transportation technologies that enable America to use less petroleum. VTO is strongly committed to partnerships to help ensure the eventual market acceptance of the technologies being developed.

APPENDIX C – FOCUS AREA ROADMAPS

Policy & Legislation

Anticipated Near-Term Subcommittee Level-of-Effort HIGH

Focus Area Framework

Near-Term Key Actions

- Review and work through potential code section revisions or additions in cooperation with the Department of Motor Vehicles, who has the authority to make changes to the AAC. Refer to:
  - Rulemaking guidance published by American Association of Motor Vehicles Administrators (AAMVA) in the *Jurisdictional Guidelines for the Safe Testing and Deployment of Highly Automated Vehicles*
  - The National Conference of State Legislatures database of other state CAV legislative actions https://www.ncsl.org/research/transportation/autonomous-vehicles-self-driving-vehicles-enacted-legislation.aspx
- Monitor forthcoming federal legislation and project funding opportunities
- Work with partner agencies and departments to ensure that CAV technology considerations are incorporated into future planning and policy documents

Longer-Term Efforts

- Monitor future federal guidance to states developing CAV policy and legislation

Partnership Opportunities

- DOT&PF Statewide Planning
- Department of Commerce, Community and Economic Development
- Alaska Municipal League
- Alaska Legislature
- Department of Law

Key Subcommittee Membership Agencies

Department of Motor Vehicles
Department of Public Safety
DOT&PF Statewide ITS Coordinator
DOT&PF Statewide Research Development and Technology Transfer
Anchorage Metropolitan Area Transportation Solutions (AMATS)
Fairbanks Area Surface Transportation (FAST) Planning

Infrastructure Readiness

Anticipated Near-Term Subcommittee Level-of-Effort

MEDIUM

Focus Area Framework

Near-Term Key Actions

- Work with partner agencies and departments to ensure that CAV technology considerations are incorporated into future planning and policy documents
- Stay apprised of forthcoming recommendations from the ENTERPRISE Pooled Fund Study for evaluating new technologies and best practices for future proofing emerging technologies.
- Pursue the following actions to ready Alaska's telecommunications and power infrastructure for CAVs:
  - Assemble a task force to evaluate Alaska's power and telecommunications needs, how to best integrate upgrades with roadway design standards, a standard detail for conduit, and the economic benefits of laying dark fiber or conduit to lease
  - Develop a 'Dig Once' Policy that provides guidance for state and local governments on agreements between telecommunications providers and roadway owner-operators to install conduit when rehabilitating roads

Longer-Term Efforts

- Pursue the following actions to ready Alaska's physical and digital roadway infrastructure for CAVs:
  - Collaborate with DOT&PF Maintenance & Operations regions to create a High-Resolution Reference System to guide signing and striping maintenance (as well as connected snow plowing)
  - Collaborate with DOT&PF to strategically install real-time traffic sensors connected with the 511 Traveler Information System
  - Monitor and implement developing cybersecurity & data management best practices for all roadway digital infrastructure and supporting Big Data.

Partnership Opportunities

- DOT&PF Right of Way and Pre-Construction Groups
- ITS Vendors
- Utilities and Satellite Internet Providers

Key Subcommittee Membership Agencies

DOT&PF Statewide ITS Coordinator
DOT&PF ITS/Traffic Engineering staff
DOT&PF Statewide Research Development and Technology Transfer
DOT&PF Statewide ROW
DOT&PF Statewide Electrical Engineer
Department of Natural Resources

Industry Partnerships

Anticipated Near-Term Subcommittee Level-of-Effort LOW

Focus Area Framework

Near-Term Key Actions

- Invite AIDEA, tourism, and freight representatives to discussions with the CAV Working Group to identify opportunities for CAV advancement in conjunction with expanding Alaskan industries
- Work with partner agencies and departments to ensure that CAV technology considerations are incorporated into future planning and policy documents
- Invite ITS/CAV industry and vendor representation to educate CAV Working Group on technology advancements
- Work with partner agencies and departments to ensure that CAV technology considerations are incorporated into future planning and policy documents

Longer-Term Efforts

- Monitor nationwide industry/agency partnerships and find opportunities to engage industry in Alaska

Partnership Opportunities

- Tourism Industry
- ITS/CAV Vendors
- University of Alaska
- Freight Industry
- Alaska Industrial Development and Export Authority (AIDEA)

Key Subcommittee Membership Agencies

DOT&PF ITS/Traffic Engineering staff
DOT&PF Statewide ITS Coordinator
Alaska Trucking Association
Department of Commerce, Community and Economic Development

Outreach and Education

Anticipated Near-Term Subcommittee Level-of-Effort HIGH

Focus Area Framework

Near-Term Key Actions

- Contribute to and participate in AASHTO Committees
- Contribute to and participate in the FHWA Connected Vehicles Pooled Fund Study projects
- Contribute to and participate in NCHRP Project 20-102 Impacts of CAVs on State and Local Transportation Agencies
- Actively participate in the Road User Charge Western Consortium (Alaska is a member as of 2019) for knowledge-sharing on alternative funding sources
- Monitor relevant, ongoing pilot projects
- Explore and pursue peer exchange opportunities to facilitate staff education
- Work with partner agencies and departments to ensure that CAV technology considerations are incorporated into future planning and policy documents
- Continue to monitor a variety of technology advancements, including those on the annual Gartner Technology Trends report
- Develop CAV educational materials for education of agency staff, the state legislature, transportation industry partners, and the public

Longer-Term Efforts

- Brief decision-makers and agency and organization leaders on CAV Working Group actions and industry developments

Partnership Opportunities

- Electric Vehicle Working Group
- University of Alaska
- DOT&PF Communications and Public Involvement Staff

Key Subcommittee Membership Agencies

DOT&PF Statewide ITS Coordinator
DOT&PF ITS/Traffic Engineering staff
DOT&PF Statewide Research Development and Technology Transfer
DOT&PF Statewide Design and Engineering
Federal Highway Administration (FHWA)

Public Safety and Enforcement

Anticipated Near-Term Subcommittee Level-of-Effort LOW

Focus Area Framework

Near-Term Key Actions

- Work with partner agencies and departments to ensure that CAV technology considerations are incorporated into future planning and policy document

Longer-Term Efforts

- Monitor nationwide trends relating to CAV safety regulations and enforcement actions
- Track adoption nationwide of automated enforcement capabilities for mixed conventional and CAV traffic

Partnership Opportunities

- Department of Administration
- Department of Public Safety
- Alaska State Troopers

Key Subcommittee Membership Agencies

Department of Motor Vehicles
Department of Public Safety
Municipality of Anchorage
DOT&PF Statewide Research Development and Technology Transfer

Freight Coordination

Anticipated Near-Term Subcommittee Level-of-Effort LOW

Focus Area Framework

Near-Term Key Actions

- Engage with Alaska Trucking Association and other freight industry contacts to invite further engagement with the CAV Working Group
- Work with partner agencies and departments to ensure that CAV technology considerations are incorporated into future planning and policy documents

Longer-Term Efforts

- Work with Alaska Trucking Association and other freight industry contacts to find CAV freight opportunities applicable to Alaska
- Monitor nationwide CAV freight technology and freight fleet vehicle trends

Partnership Opportunities

- Freight Industry
- Department of Motor Vehicles
- Alaska Trucking Association

Key Subcommittee Membership Agencies

Alaska Trucking Association
Department of Motor Vehicles
DOT&PF Statewide ITS Coordinator
DOT&PF ITS/Traffic Engineering staff
DOT&PF Statewide Research Development and Technology Transfer