Connected and Automated Future of Transportation for Kansas
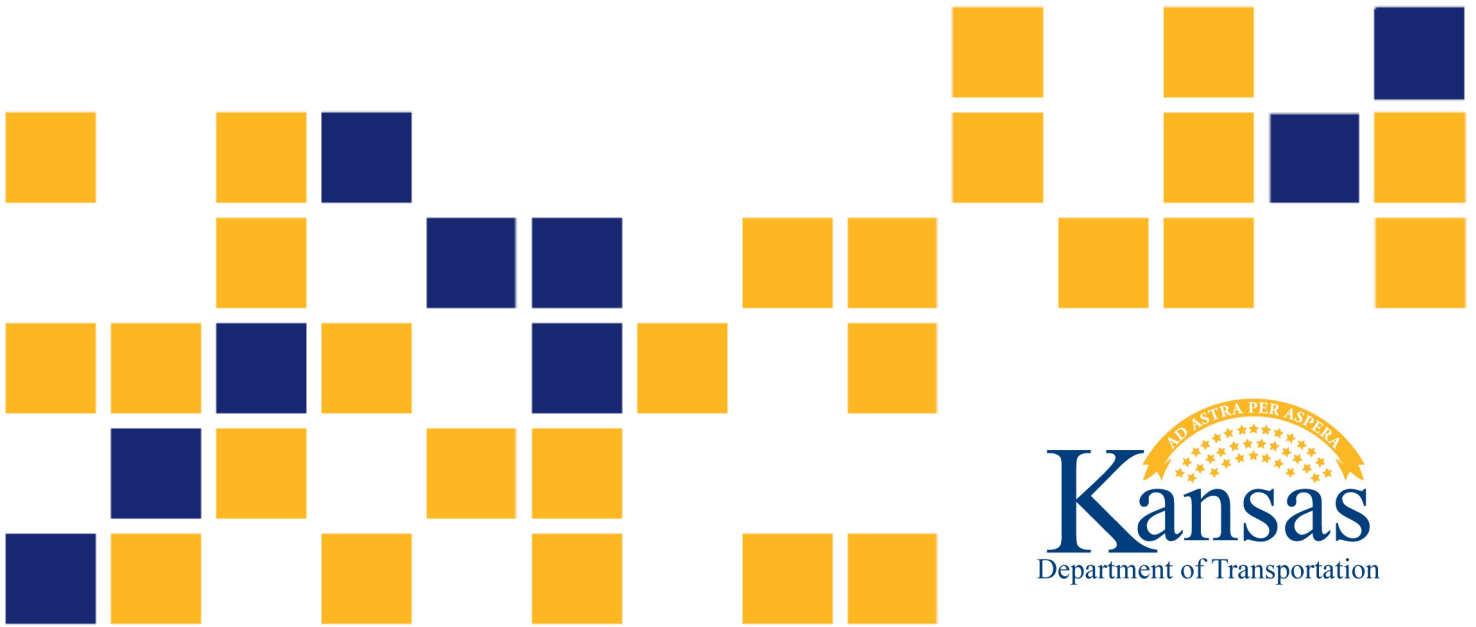
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Kansas State University Transportation Center

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16 **Abstract**

The connected and automated vehicle (CAV) technologies will bring unprecedented changes in the landscape of transportation systems for areas like operations, management, and infrastructure needs. To assure a safe, reliable, and trustworthy connected and automated transportation system, it is important to have a clear CAV implementation pathway that includes operational guidelines, expected benefits, and deployment standards, which will allow all stakeholders (general public, infrastructure owner operators, departments of transportation, cities, metropolitan planning organizations, technology developers) to work holistically. To support the foundational CAV implementation pathways for the state of Kansas, this research aims to synthesize the existing CAV regulation and policies, ongoing and planned deployments of CAV technologies, and workforce development and educational outreach efforts. This will help build a functional knowledge base and allow us to learn from ongoing efforts to transition to the CAV environment.

Our synthesis study also examines the CAV readiness of the different states using the survey data collected by the U.S. Intelligent Transportation System Joint Program Office. This report summarizes the strategic priorities of these states and the steps that these different states have undertaken for expanding educational outreach, focusing on the stakeholder, specifically the general public, transportation agencies, policymakers, and technology developers. This study can be used as a resource to compare and contrast the policies, laws, and guidelines that other progressive states are following (e.g., license for testing AVs on roads, vehicle registration procedures); what steps the states have taken to educate their citizens about these emerging technologies (e.g., webinars, training programs); how much the states are ready to accommodate these technologies in the future (e.g., infrastructure development, managing funding resources); and what types of pilot projects have been undertaken and are currently ongoing (e.g., automated shuttles, delivery services).

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Connected and Automated Future of Transportation for Kansas

Final Report

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Kansas State University Transportation Center

PREFACE

The Kansas Department of Transportation's (KDOT) Kansas Transportation Research and New-Developments (K-TRAN) Research Program funded this research project. It is an ongoing, cooperative, and comprehensive research program addressing transportation needs of the state of Kansas utilizing academic and research resources from KDOT, Kansas State University and the University of Kansas. Transportation professionals in KDOT and the universities jointly develop the projects included in the research program.

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Abstract

The connected and automated vehicle (CAV) technologies will bring unprecedented changes in the landscape of transportation systems for areas like operations, management, and infrastructure needs. To assure a safe, reliable, and trustworthy connected and automated transportation system, it is important to have a clear CAV implementation pathway that includes operational guidelines, expected benefits, and deployment standards, which will allow all stakeholders (general public, infrastructure owner operators, departments of transportation, cities, metropolitan planning organizations, technology developers) to work holistically. To support the foundational CAV implementation pathways for the state of Kansas, this research aims to synthesize the existing CAV regulation and policies, ongoing and planned deployments of CAV technologies, and workforce development and educational outreach efforts. This will help build a functional knowledge base and allow us to learn from ongoing efforts to transition to the CAV environment.

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List of Acronyms

Acronym	Elaboration
ACC	Adaptive Cruise Control
ADOT	Arizona Department of Transportation
ADS	Automated Driving System
ATIS	Advanced Traveler Information Systems
AT	Automated Transportation
ATC	Automated Transportation Council/Advisory Council on Automated Transportation
AV(s)	Automated/Autonomous Vehicle(s)
CACC	Cooperative Adaptive Cruise Control
Caltrans	California Department of Transportation
CAV(s)	Connected and Autonomous Vehicle(s)
CAT	Cooperative and Automated Transportation
CTSS	Columbus Traffic Signal System
CV(s)	Connected Vehicle(s)
C-V2X	Cellular Vehicle-to-Everything
D.A.T.A.	Deploying Automated Technology Anywhere
DCEO	Department of Commerce & Economic Opportunity
DMV	Department of Motor Vehicles
DOT	Department of Transportation
DSRC	Dedicated Short-Range Communications
E-AV	Electric Autonomous Vehicles
FAU	Florida Atlantic University
FIU	Florida International University
FPU	Florida Polytechnic University
FDOT	Florida Department of Transportation
GPS	Global Positioning System
IDOT	Illinois Department of Transportation
ILAVA	Illinois Autonomous Vehicles Association
INDOT	Indiana Department of Transportation
ITS	Intelligent Transportation Systems
ITS JPO	Intelligent Transportation Systems Joint Program Office
KSA(s)	Knowledge, Skills and Abilities

Acronym	Elaboration
LIDAR	Light Detection and Ranging
MAW	Motorist Advisories & Warnings
MnDOT	Minnesota Department of Transportation
MoDOT	Missouri Department of Transportation
NCSL	National Conference of State Legislatures
NHTSA	National Highway Traffic Safety Administration
NYC	New York City
ODD	Operational Design Domain
ODOT	Oregon Department of Transportation
OTA	Over the Air
PAVE	Partners for Automated Vehicle Education
PennDOT	Pennsylvania Department of Transportation
PTC	Pennsylvania Transportation Center
RADAR	Radio Detection and Ranging
RSU	Roadside Unit
SAE	Society of Automotive Engineers
SAV	Shared Autonomous Vehicle
SPaT	Signal Phasing and Timing
SPO-HARM	Dynamic Speed Harmonization
TDM	Transportation Demand Management
TMC	Traffic Management Center
TxDOT	Texas Department of Transportation
TTS	Traffic Technology Services
UCF	University of Central Florida
UNF	University of North Florida
UF	University of Florida
USDOT	United States Department of Transportation
USF	University of South Florida
V2I	Vehicle to Infrastructure
V2V	Vehicle to Vehicle
V2X	Vehicle to Everything
VCC	Virginia Connected Corridors
VDOT	Virginia Department of Transportation
VTRANS2040	Virginia's Long-Range Statewide Multimodal Transportation Plan

Chapter 1: Introduction

The concept of connected and automated transportation is rapidly gaining traction—visibility and potential benefits—in the United States. Dimensions of this disruptive technology—operations, planning, and policy—need to be explored and examined to understand the future pathways of the connected and automated vehicle (CAV) deployments in our diverse transportation systems. This is critical to maintaining our lead in fast-paced CAV technology development, particularly focusing on three key aspects: safety, security, and data privacy (Mashayekh et al., 2014). Building public trust and confidence in the CAV technology—a key driver of effective deployments—will significantly depend on assessing these three aspects. Also, CAV deployments will need reinforcement from the collaboration and technology adaptation by the stakeholders, including state, local, tribal, and territorial governments, academia, industry, non-profit organizations, the federal government, and standards development organizations (SDO). The state, local, and tribal governments need to play a major role in developing regulations regarding CAVs within their respective jurisdictions. Therefore, it is important to lay out plans for future CAV deployments with a clear understanding of the regulations, policy, and overall shift in the transportation workforce and education paradigm.

Addressing the need to develop future CAV deployment pathways for the state of Kansas, this research project focuses on (a) examining the regulations regarding future testing and deployment of the CAVs; (b) exploring the existing CAV deployments across the nation; (c) identifying the educational and workforce preparation strategies. To this end, the goals of this project are to:

- Synthesize the existing regulation and policies in the U.S. regarding deployments of CAV technologies.
- Create a knowledge base to understand how other state agencies across the nation are preparing the transition to a connected and automated transportation landscape. The focus is to identify the anticipated barriers for CAV deployment and to recognize what we can adapt from other states who are already transitioning to the CAV environment.
- Summarize the planned and on-going educational outreach and workforce development activities in the U.S.

Based on our exploration of technical reports, research publications, and documents describing the standards, the three most used terms are CV (Connected Vehicle), AV (Autonomous or automated vehicle), and CV/AV (this is interchangeably used with CAVs in several documents). This report will use CV/AV to refer to CAV technology in general—mainly to discuss elements where a clear distinction between the technologies is not needed.

The report is organized in five sections: summary of legal policies regarding AV operations, an overview of CV and AV infrastructure-readiness at local and state level, exploration of existing AV and CV deployment projects across the nation, synopsis of strategic priorities, and educational efforts at the state level in support of CV/AV deployments.

Chapter 2: Legal Policies/Regulations Regarding Automated Vehicle Operations and Testing

This section explores and summarizes the legal policies, guidelines, and proposed/enacted bills regarding AV deployment and testing in the states across the nation. We have explored the existing practices relevant to defining and executing the regulations and policies regarding transitioning to the CAV environment. We have reviewed the regulation, policies, and current deployments of connected and automated vehicle-related projects in four major census regions of the U.S. (Northeast, Midwest, South, and West). Our primary focus is on the states in the Midwest, those similar to Kansas in terms of transportation infrastructure, transportation network attributes, and overall socio-demographic characteristics. **Table 2.1** summarizes the key findings, regulation, deployment requirements, and presence of vision/strategic plans.

2.1 Current Status

According to the National Conference of State Legislatures (NCSL, 2020), Washington, D.C. and twenty-nine states (Alabama, Arkansas, California, Colorado, Connecticut, Florida, Georgia, Illinois, Indiana, Kentucky, Louisiana, Maine, Michigan, Mississippi, Nebraska, Nevada, New York, North Carolina, North Dakota, Oregon, Pennsylvania, South Carolina, Tennessee, Texas, Utah, Vermont, Virginia, Washington, and Wisconsin) have enacted legislation related to autonomous vehicles—operations, deployment, testing, and licensing (**Figure 2.1**). For some states, executive orders relevant to AVs are in effect (Delaware, Hawaii, Idaho, Illinois, Maine, Massachusetts, Minnesota, Ohio, Washington, and Wisconsin).

States with Autonomous Vehicles
Enacted Legislation and Executive Orders
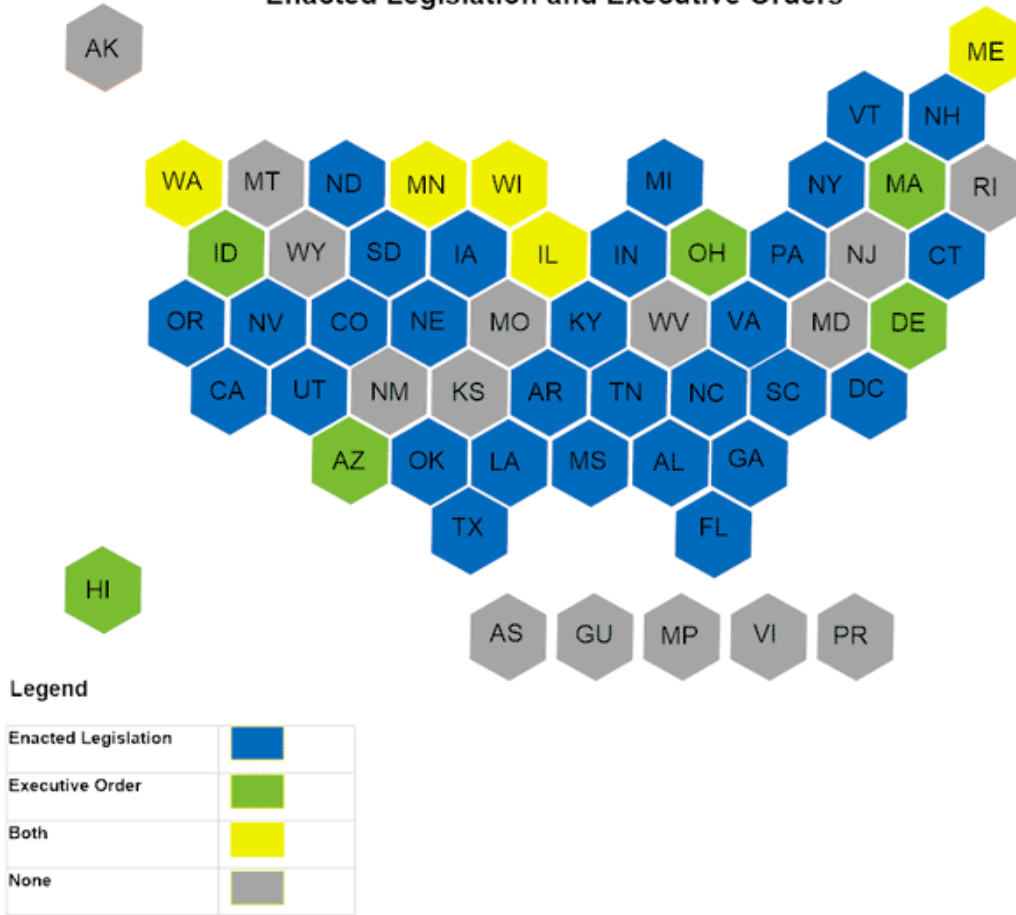
Figure 2.1: Map of US States with AV Regulations
Source: NCSL (2020)

Table 2.1: Summary of Findings from the Four Census Regions

State	Enacted Any Regulation/ Legal Policy on AV Deployment/ Operations (Yes/No)	Executive Order	Vehicle Registration and/or Testing Permitting	Testing AV Deployment on public roads (Yes/No)	AV Testing in Controlled Environment (Yes/No)	Testing CV Deployment (Yes/No)	Have a CAV vision plan (strategic) report/ initiative? (Yes/No)
Region 1: Northeast							
New York	Yes	No	Yes	No	Yes	Yes	Yes
Pennsylvania	Yes	No	Yes	Yes	Yes	Yes	Yes
Massachusetts	No	Yes	No	Yes	NA	Yes	Yes
Region 2: Midwest							
Illinois	Yes	Yes	No	No	No	No	No
Indiana	Yes	No	No	No	No	Yes	Yes
Iowa	Yes	No	No	No	No	No	No
Michigan	Yes	No	Yes	Yes	Yes	Yes	Yes
Missouri	No	No	No	No	NA	No	No
Nebraska	Yes	No	No	Yes	NA	No	Yes
Ohio	No	Yes	No	Yes	NA	Yes	Yes
Region 3: South							
Florida	Yes	No	No	Yes	NA	Yes	Yes
Georgia	Yes	No	No	Yes	NA	Yes	Yes
Texas	Yes	No	No	Yes	NA	No	Yes
Virginia	Yes	No	No	Yes	NA	Yes	Yes
Region 4: West							
Arizona	No	Yes	No	Yes	NA	Yes	Yes
California	Yes	No	No	Yes	NA	Yes	Yes
Colorado	Yes	No	No	Yes	NA	Yes	Yes
Nevada	Yes	No	No	Yes	NA	Yes	Yes

The following subsections provide a summary of AV-related legal policies for different states.

2.1.1 California

California Department of Motor Vehicles (DMV) is the authority for providing AV deployment guidelines and legislation. On March 10, 2017, California DMV proposed regulations to establish a path for the testing and deploying of fully autonomous vehicles in California (State of California Department of Motor Vehicles, 2021). California's approach to regulating autonomous vehicles is comprehensive, enacting several laws that lay out procedures for testing

and deploying driverless cars. The state recently approved self-driving car tests without backup drivers (Dentons, 2019).

2.1.2 Florida

Florida's legislation, passed in 2012, was the first legislative intent to encourage the safe development, testing, and operation of motor vehicles with autonomous technology on the state's public roads. Florida's 2016 legislation expands the allowed operation of autonomous vehicles on public roads. It eliminates requirements related to the testing of autonomous vehicles and the presence of a driver in the vehicle. Florida passed House Bill 311 to relax its autonomous vehicle regulations further (NCSL, n.d.). Under the new law, any driverless vehicle can operate in the state as long as it can comply with existing state and federal laws and has liability insurance of $1 million (Dentons, 2019).

2.1.3 Arizona

Testing or operating self-driving vehicles equipped with an automated driving system on public roads must follow all federal laws, regulations, and guidelines (Arizona Revised Statutes, 2019). Arizona enacted House Bill H.B. 2813 in 2021, which provides the rules, regulations, and policies regarding AVs.

2.1.4 Michigan

Michigan enacted House Bill H.B. 5335 titled "State Infrastructure Council" in 2018. Topics of this bill included infrastructure and connected vehicles. The purpose of this bill was to establish the State Infrastructure Council to prescribe the powers and duties of certain state and local agencies and officials, requiring the Council to develop a multiyear program: work plan, budget, and funding recommendation for asset management, to relate drinking water, wastewater, stormwater, transportation, energy, and communications (NCSL, n.d.).

2.1.5 Iowa

According to NCSL (n.d.) Iowa enacted Senate Bill S.B. 302 in 2020, titled *Automated Driving System Motor Vehicles,* which established regulations for motor vehicles operated by an automated driving system.

2.1.6 Missouri

Missouri law prohibits the registration and testing of driverless cars (NCSL, 2020).

2.1.7 Indiana

As of 2021, Indiana has enacted no bill regulating AV deployment to the best of the authors' knowledge.

2.1.8 Colorado

Senate Bill 17-213 authorized the use of highly autonomous driving systems in Colorado under certain conditions, which established Colorado as one of the most forward-leaning states in the country (Colorado Department of Transportation, n.d.-b). The legislation established the following policy environment to support the continued advancement and deployment of Automated Driving Systems (ADS) in Colorado:

- Levels of automation 0-3 (SAE) are legal under Colorado law with a human driver in the vehicle.
- With or without a human driver, highly autonomous driving systems (Level 4-5) are authorized to operate in Colorado if they can meet all applicable state and federal laws.
- Suppose the ADS cannot meet all state and federal laws. In that case, the Colorado Department of Transportation and the Colorado State Patrol are responsible for approving their operation in the State.
- No State agency or local jurisdiction may set policy or regulations for an ADS that are different from the standards set for a human driver.

S.B. 17-213 designated the Colorado State Patrol and CDOT to oversee a process for approving the operation of an ADS that cannot meet any federal, state, and local law. The process features submission of an entity's request to the Autonomous Mobility Task Force, which is a joint body between the Colorado State Patrol (CSP), Colorado Department of Revenue (DOR), and Colorado Department of Transportation (CDOT).

2.1.9 Virginia

Virginia has no regulations regarding AVs for a state where AV testing is actively occurring. However, the state has actively encouraged testing and deployment (Dentons, 2019; Virginia Department of Transportation, 2020).

2.1.10 Oregon

In 2018, House Bill 4063 was enacted to provide the guidelines and legislation (H.B. 4063-B, 2018). In summary, this legislation permits the operation of autonomous vehicles on highways in this state under certain circumstances; directs owners of commercial autonomous vehicles to obtain additional motor vehicle liability insurance policies; and directs the Department of Transportation to adopt rules for the operation of autonomous vehicles on highways in this state. In 2019, House Bill 2773 failed to pass, which would have permitted testing of highly automated vehicles on highways of this state under certain circumstances.

2.1.11 Texas

In 2017, the Texas Legislature enacted two bills that addressed connected and automated vehicles (Texas Department of Transportation, 2017). Senate Bill 2205 created a legal framework for the operation of automated motor vehicles in Texas and explicitly allows an automated motor vehicle to operate on highways in the state, with or without a human operator, under certain circumstances. The law does not require TxDOT involvement with the state's operation or management of automated vehicles (Texas Department of Transportation, 2017).

House Bill 1791 (Texas Department of Transportation, 2017) authorizes an operator of a vehicle equipped with a connected braking system following another vehicle equipped with that system to receive assistance from the connected braking system to maintain a clear distance or *sufficient space* between the vehicles. This act allows the coordinated close following of vehicles, sometimes referred to as *platooning*.

2.1.12 New York

New York has strict regulations on AV testing (Dentons, 2019). Under legislation approved in 2017, any testing must be approved by the Commissioner of the Department of Motor Vehicles and supervised by the New York State Police. While more relaxed requirements were proposed in

the last legislative session, they failed to pass. Several bills are pending in the NYS legislature that would advance New York's AV legislative framework if passed, including several referred to committees in January 2020.

2.1.13 Massachusetts

There are no self-driving vehicle laws in Massachusetts. In 2016, the governor issued an executive order to facilitate the testing and operation of self-driving cars in the state. There are no laws that specifically prohibit self-driving vehicles. House Bill H.3475, introduced by lawmakers in 2021, would require autonomous vehicles registered in Massachusetts to continue to meet federal standards and regulations for a motor vehicle. The autonomous vehicle legislation stipulates that such vehicles shall not engage in interstate commerce or transport eight or more people or goods for hire unless a human operator is present in the autonomous vehicle. They can monitor the vehicle's performance and intervene if required (Stevens, 2021).

2.1.14 Wisconsin

Although Wisconsin has no current AV laws or regulations, former Governor Scott Walker signed an executive order in 2017 to propose regulations for the vehicles (Dentons, 2019). The committee made several recommendations in 2018, including requiring municipal oversight, an application process, and backup drivers. As it stands, current state law does not prohibit the operation of autonomous vehicles. In 2018, Senate Bill 695, titled *Motor Vehicle Distances* was enacted, listing provisions relating to distances between motor vehicles (including CVs) and making technical corrections.

2.1.15 Nebraska

In April 2018, Nebraska lawmakers cleared the way for companies to test self-driving vehicles after they enacted "Autonomous vehicle testing" legislation. The AV may or may not contain a human driver, but if a human driver is present, he or she must be a licensed driver and covered by insurance. The law also authorizes the operation of an on-demand AV network to move people and goods (NCSL, n.d.).

2.1.16 Oklahoma

Oklahoma has not enacted any legislation regarding AV or CAV.

2.1.17 Ohio

A 2018 executive order (EO) signed by former Governor John Kasich positioned Ohio as a leader in the driverless vehicle space (Dentons, 2019). The EO created DriveOhio, a new division of the state Department of Transportation to attract different stakeholders and allows any company to test AVs in the state as long as they register with DriveOhio and have a backup driver behind the wheel. Columbus, Dublin, Athens, and Marysville have already signed agreements with DriveOhio to test AVs on their streets. The state has designated a 35-mile stretch of US Route 33 a *Smart Mobility Corridor* to deploy connected vehicle technologies. Funded by a partnership between Ohio State University and the state of Ohio, the $45 million SMART Testing Center in Logan County will include an indoor highway track capable of simulating ice and snow year-round.

2.1.18 Pennsylvania

Pennsylvania law enacted House Bill 1958 in 2018 titled *Autonomous Vehicles*. This bill amends statute relating to vehicles, provides additional rules of the road in general, relates to platooning, and provides for highly automated vehicles (NCSL, n.d.).

2.1.19 Georgia

According to NCSL (n.d.) Georgia allows autonomous vehicles and trucks to operate under legislation passed in 2017. Driverless vehicles are free to operate in the state as long as they are fully insured and registered with the Department of Motor Vehicles.

2.1.20 Illinois

Illinois does not have any self-driving car laws. However, the governor signed an executive order in 2018 that established an initiative to promote the development and testing of self-driving cars in the state (NCSL, n.d.). However, in 2021, one senate bill and one house bill regarding AV failed to pass into law. As of now, no bill/legislation is found to be enacted by the state.

2.1.21 Nevada

In 2021, Nevada enacted Assembly Bill A.B. 412 titled *Fully Autonomous Vehicles,* which relates to motor vehicles, revises provisions governing fully autonomous vehicles, and provides other matters properly relating thereto (NCSL, n.d.). In 2021, Nevada also enacted Senate Bill "S.B. 288" titled "Transportation Network Company Agreements," according to NCSL (n.d.). It authorizes a monitored autonomous vehicle provider to enter into an agreement with a transportation network company to provide transportation services through the digital network or software application of the company. Additionally, it imposes certain requirements on a transportation network company and monitored autonomous vehicle provider relating to the provision of transportation services by a monitored independent vehicle provider.

2.1.22 Washington

In 2018, Washington state enacted House Bill H.B. 2970 titled *Autonomous Vehicle Work Group*, which established an autonomous vehicle work group to develop policy recommendations to address the operation of autonomous vehicles on public roadways in the state (NCSL, n.d.). In 2020, House Bill H.B. 2676 was enacted, which establishes minimum requirements for the testing of autonomous vehicles. In 2021, Senate Bill S.B. 5460 was enacted, which implements recommendations of the autonomous vehicle work group, defines autonomous, removes a provision that prevents a person from driving a vehicle equipped with certain video screens that are visible to the driver (NCSL, n.d.).

Chapter 3: Infrastructure Readiness for Connected and Automated Transportation Systems

The 2019 Intelligent Transportation Systems Joint Program Office (ITS JPO) conducted an online CV/AV survey to collect data from the freeway, arterial, and transit agencies of 78 large metropolitan areas and 30 medium-size cities (Chajka-Cadin et al., 2020). Online data collection ran from October 7th to December 31st in 2019. The final response rate was 60 percent, including 66 freeway, 301 arterial, and 108 transit agencies. The survey questionnaire covered a range of topics, including deployment levels for CV and AV, the types of CV applications and AV testing cases being, communication technologies being used to support CV, the readiness of infrastructure and the agency *per se*, challenges faced in deploying CV and AV, and resources needed to support existing and future deployments of the CV/AV technologies.

The surveyed agencies are still in the early stages of connected and automated vehicle deployment. In the survey, only one-fourth of the surveyed agencies reported deploying CV projects, although about 30 percent indicated plans to deploy CV/AV testing projects in the near future. Freeway agencies were found to be leading the way in CV deployment as two-thirds of them have already deployed or are planning to deploy CV technologies. Arterial and transit agencies gradually increased their CV deployment activities since 2016, while freeway activity remains constant (Chajka-Cadin et al., 2020).

The survey data indicated that most agencies focused on CV/AV applications to improve transportation systems' safety, mobility, and environmental/energy performance measures. Each agency type has a set of CV/AV applications that meet its unique needs. For instance, freeway operating agencies select applications focused on improving highway safety and mobility; while arterial management agencies seek traffic signal-based solutions to mobility and safety issues; and transit agencies underscore the solutions to improve customer service and operations (Chajka-Cadin et al., 2020).

Roughly 40 percent of surveyed agencies report AV testing or deployment in their region or state. However, only 14 percent are involved in the testing. Most of the surveyed agencies were found to have a supporting role, rather than leading the efforts (Chajka-Cadin et al., 2020). Further, freeway agencies appear to be more aware of AV testing/deployment. Across all agencies aware

of AV testing, *automated fixed-route shuttle tests* are the most reported, followed by *truck platooning and automated light-duty vehicles.* Further, the test locations vary by vehicle type—transit buses and light-duty vehicle tests occur most frequently on urban city streets and automated commercial vehicle tests on highways.

The survey data suggest that upgrading physical and communications infrastructure is vital for CV/AV deployments. Partnering with industry and technology developers stands out as the most common readiness factor for agencies involved in AV testing. The findings indicate the need for federal- and state-level supports and integration into transportation planning processes for both AV and CV deployments. The Appendix shows all the agencies that took part in the readiness survey.

3.1 Key Observations from the AV/CV Readiness Data

3.1.1 Challenges for AV/CV Deployment

The participants were asked about major challenges to the AV/CV deployment concerning multiple aspects, including costs (infrastructure, operations, and maintenance), technology, data management, relevant issues, and public acceptance (as well as acceptance by the transportation workforce). Most agencies are aware of CAV benefits and indicated that the cost to update/upgrade the existing infrastructure is a major concern (**Figure 3.1**). Maintenance and lack of information regarding the CV technology have been listed as the major challenges (**Figure 3.2**). Interestingly, many agencies did not identify data privacy as a major challenge (**Figure 3.3**). Also, many agencies' lack of leadership support is a major challenge for the AV/CV deployment (**Figure 3.4**).
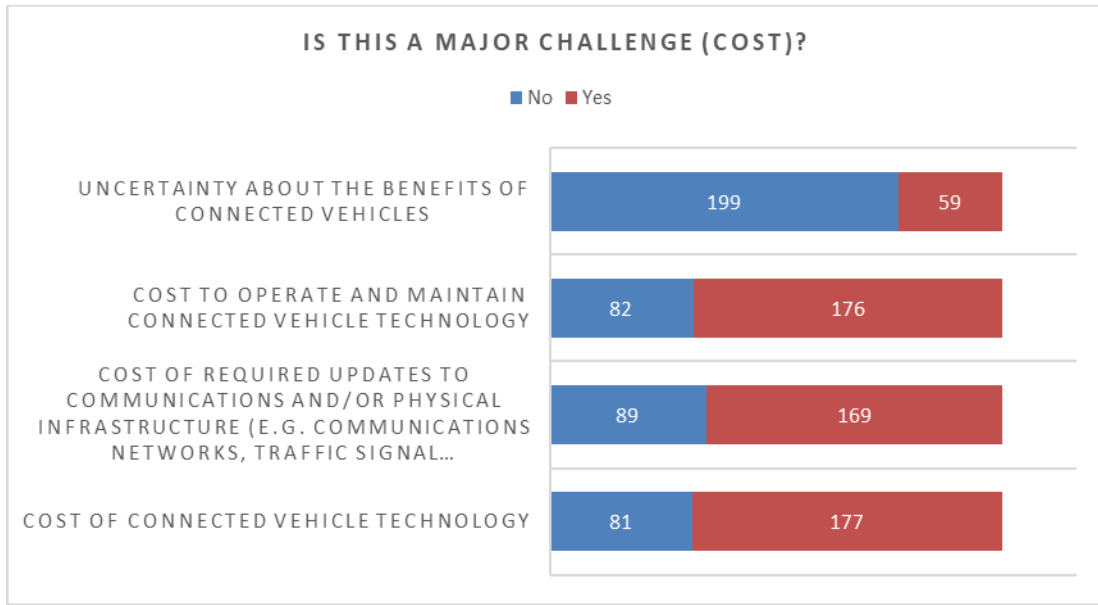
Figure 3.1: Survey Statistics: Is cost a major challenge to the deployment of AV/CV technologies?
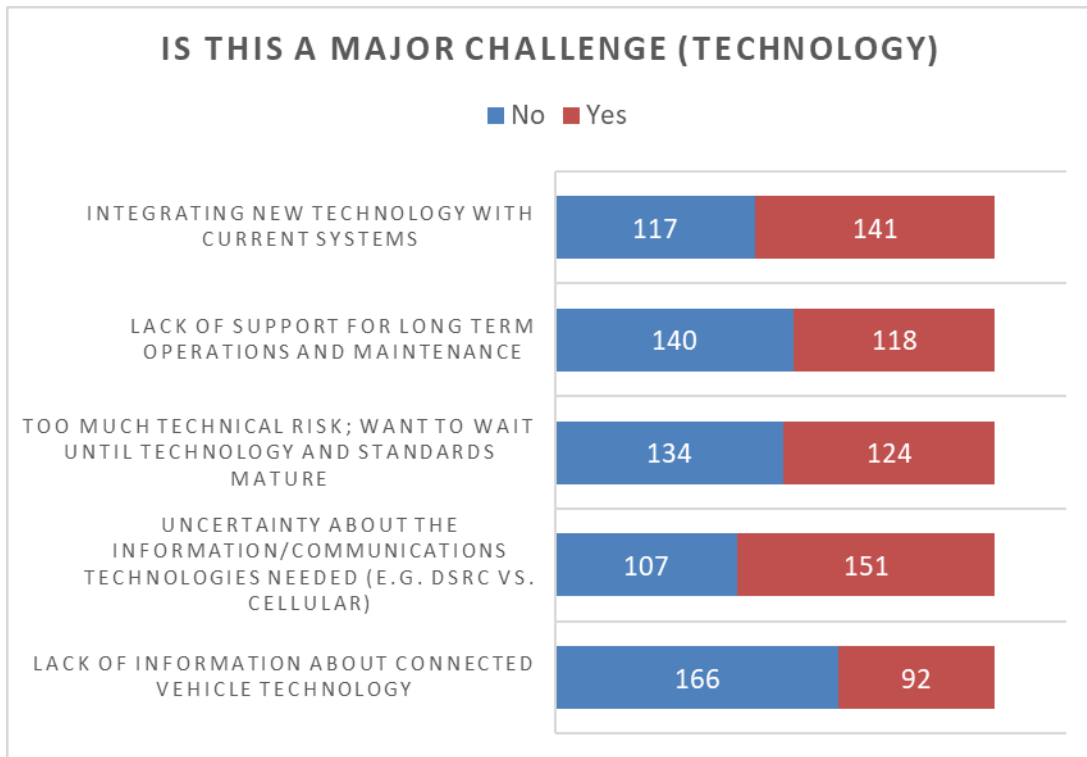
Figure 3.2: Survey Statistics: Is technology a major challenge to the deployment of AV/CV technologies?
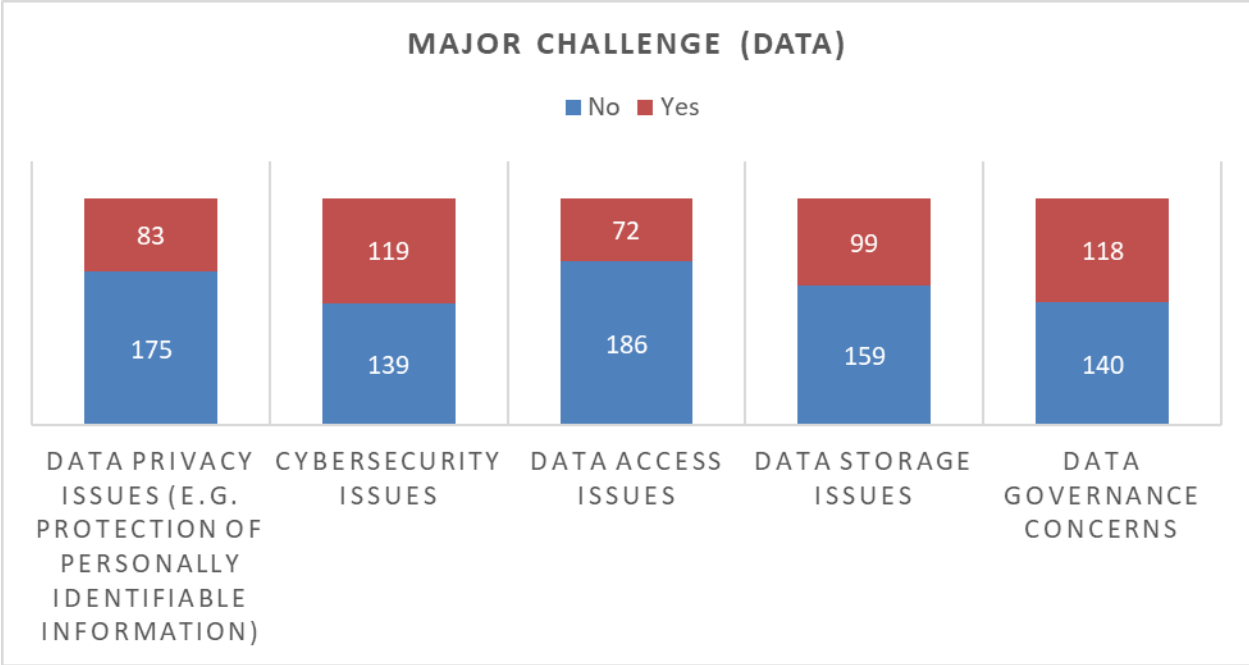
Figure 3.3: Survey Statistics: Is data management/access/privacy a major challenge to the deployment of AV/CV technologies?
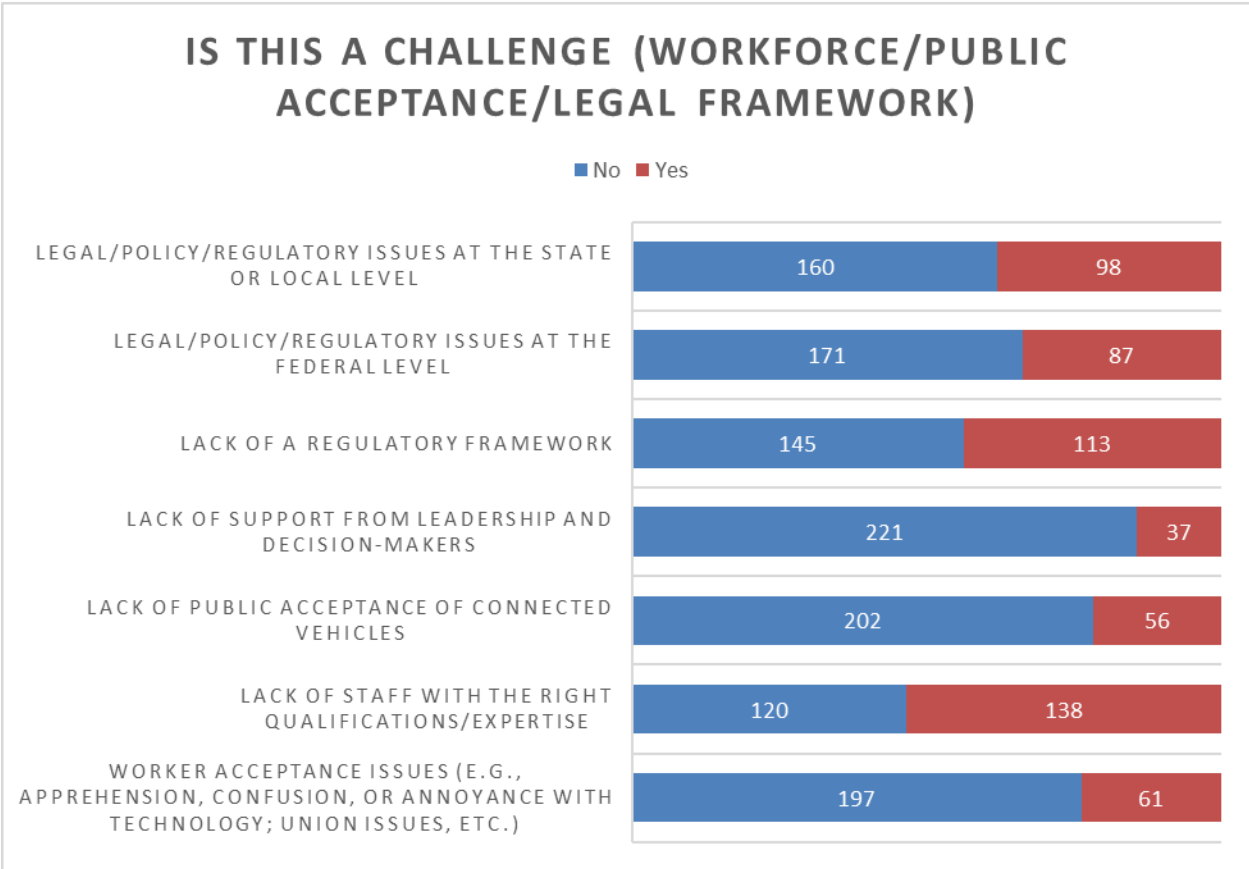
Figure 3.4: Survey Statistics: Is public/workforce acceptance a major challenge to the deployment of AV/CV technologies?

3.2 Agency-Level Efforts

The agencies also indicated the ongoing efforts regarding the AV/CV deployments (**Figure 3.5**). Most agencies responded with either "no plans" or "don't know." This indicates the preparedness of the agencies has not reached the readiness level needed for a comprehensive deployment. The agencies were also asked about the most needed resource/assistance for CV/AV deployment and developing a comprehensive plan for future implementation. The priorities include documentation on the best practices of AV deployments, legal policy, and competitive grant funds (**Figure 3.6**).
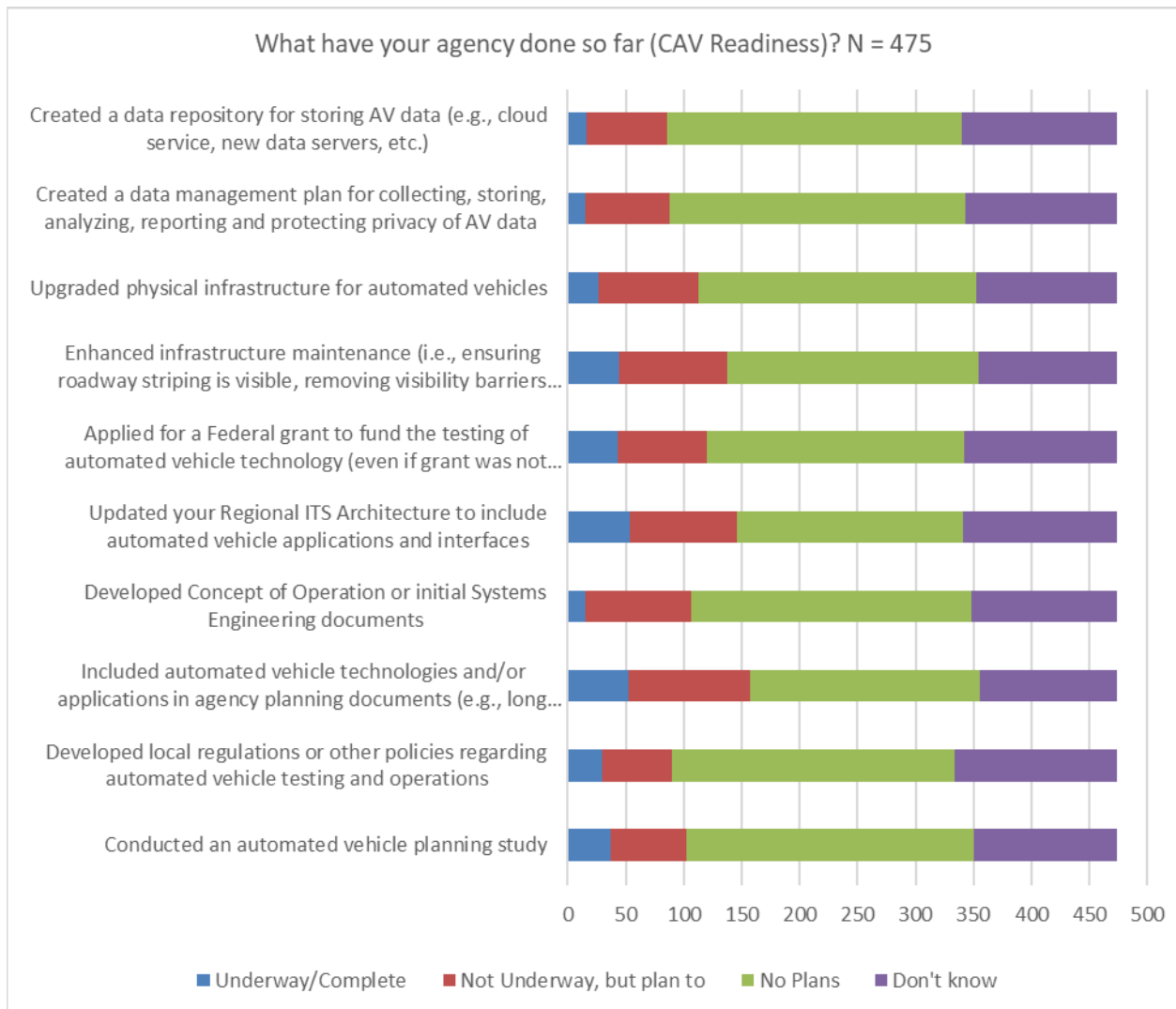
Figure 3.5: Survey Statistics: Agency's Efforts Regarding AV/CV Deployment

ASSISTANCE/RESOURCE NEEDED

Legend:
- ■ No
- ■ Yes

Category	No	Yes
LEGAL/REGULATORY/POLICY SUPPORT AT THE STATE/LOCAL…	185	290
LEGAL/REGULATORY/POLICY SUPPORT AT THE FEDERAL LEVEL	212	263
INFORMATION ON INSTITUTIONAL ARRANGEMENTS AND AGREEMENTS	221	254
TECHNICAL ASSISTANCE	201	274
EDUCATION FOR THE GENERAL PUBLIC	229	246
EDUCATION FOR DECISION-MAKERS	199	276
TRAINING/TECHNICAL ASSISTANCE	200	275
INFORMATION/DATA ON COSTS OF AUTOMATED VEHICLE…	187	288
INFORMATION ON THE BENEFITS/RETURN ON INVESTMENT	204	271
EVALUATION METHODS AND STRATEGIES	199	276
BEST PRACTICES ON AUTOMATED VEHICLE DEPLOYMENTS	163	312
TECHNOLOGY PROCUREMENT INFORMATION	213	262
COMPETITIVE GRANT FUNDS	179	296

Figure 3.6: Survey Statistics: Most Needed Assistance or Resource Needed Regarding AV/CV Deployment

Chapter 4: Current Deployment of AV/CV Projects

This section describes the ongoing automated vehicles (AV) and connected vehicles (CV) projects. A few states have projects that integrate CV and AV technologies and are labeled as connected and automated vehicle (CAV) projects.

4.1 AV Deployment and Testing

According to the NHTSA (n.d.) AV testing tracking map, only 18 states have ongoing AV testing projects, including California, Utah, Nevada, Arizona, New Mexico, Colorado, Nebraska, Texas, Wisconsin, Michigan, Ohio, New York, Massachusetts, Pennsylvania, Maryland, Virginia, North Carolina, and Florida. Only four states are testing with AV trucks (heavy-duty vehicles) on highways and freeways with a total of seven testing sites—one in Texas, two in California, three in Arizona, and one in New Mexico. Nine testing sites are working with delivery robots in three states—three in Texas, two in Arizona, four in California—on streets, parking lots, and business campuses.

Figure 4.1 shows the distribution of AV testing sites by vehicle types. Light-duty (passenger cars) and shuttles dominate the distribution.

TESTING SITES BY VEHICLE TYPES (REPORTED TO NHTSA)

- SUV 5%
- Van 3%
- Mixed Fleet 1%
- Heavy Truck 6%
- Delivery Robot 8%
- Shuttle 41%
- Car/Light Duty 36%
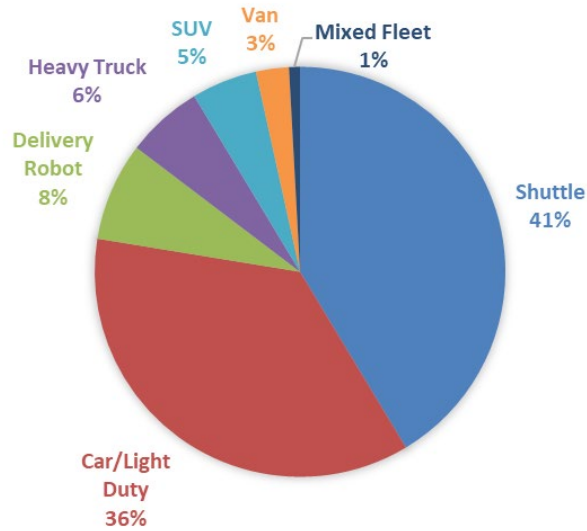
Figure 4.1: Distribution of AV Testing Sites by Vehicle Types
Data Source: NHTSA (n.d.)

Figure 4.2 reports the distribution of AV-Shuttle testing sites by specific facility/road types. AV Shuttles are mostly being tested on public streets with low speed. However, we could not find much information regarding traffic density and geographic diversity, such as rural versus urban.

SHUTTLE TESTING SITES BY ROAD TYPES (TOTAL 35 SITES)

- University 8%
- Business Campus 2%
- Parking Lot 8%
- Path/Sidewalk 4%
- Street 42%
- Not Specified 36%
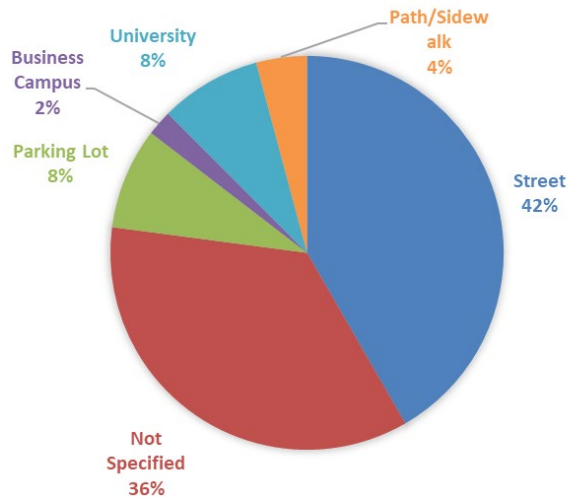
Figure 4.2: Distribution of AV-Shuttle by Road/Facility Type

Figure 4.3 shows the distribution of the cars (light-duty) AV-testing sites based on road types. Only 14 percent of the AV testing sites are located on highways and freeways.
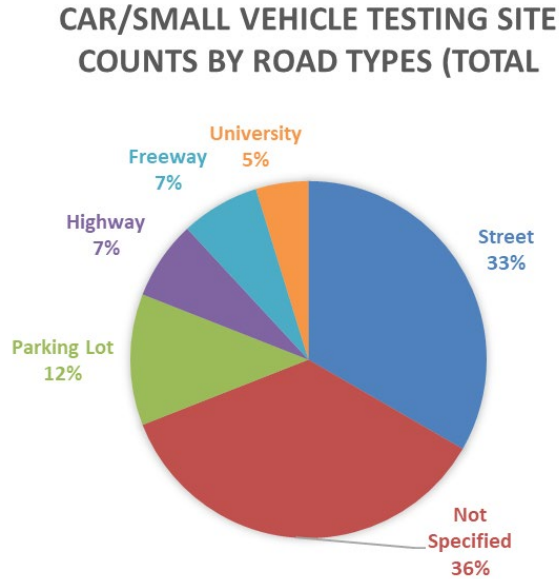
Figure 4.3: Distribution of Small Vehicle Testing by Road Types

4.2 List of State-Specific AV Projects

Table 4.1 lists the ongoing AV project deployments in different states. The details can be found either in the listed reference (see Project Title column) or on the NHTSA AV tracking tool website.

Table 4.1: State-Wise List of AV Projects
Source: NHTSA (n.d.)

State	Project Title	Location	Vehicle	Road	Safety Driver	Use	AV technology	Site Coordinator
CA	Heavy Truck Testing	San Francisco, California	Truck	Public Highway	In-Vehicle Safety Operator	Delivering Goods	Embark Trucks, Inc.	Embark Trucks, Inc
CA	Heat Testing		Car	Public Not Specified	In-Vehicle Safety Operator	Test Team Only		Waymo
CA	Closed Course Testing		Mixed Fleet	Private Not Specified	Not Reported	Test Team Only	Waymo	Waymo
CA	Nvidia-Santa Clara Public Street Testing		Car, FORD FUSION HYBRID	Public Street	In-Vehicle Safety Operator	Test Team Only	FORD MOTOR COMPANY, USA	NVIDIA Corporation
CA	Public Roads Testing	Mountain View and Sacramento, California	Delivery Robot, NURO R2		In-Vehicle or Remote Operator	Test Team Only	Nuro	Nuro
CA	Testing	Los Altos, California	Car, LEXUS	Public Not Specified	In-Vehicle Safety Operator	Test Team Only	Toyota Research Institute	Toyota

State	Project Title	Location	Vehicle	Road	Safety Driver	Use	AV technology	Site Coordinator
CA	On Road Testing	Palo Alto, California	Car, FORD FUSION HYBRID	Public Street	In-Vehicle Safety Operator	Test Team Only	Argo AI	Argo AI
CA	Drive4U Road Testing	San Mateo, California	SUV, LAND ROVER EVOQUE	Public Street	In-Vehicle Safety Operator	Test Team Only	Valeo	Valeo Mobility Tech Center
CA	Medical Delivery	San Mateo and Sacramento, California	Delivery Robot, NURO R2	Private Business Campus		Delivering Goods	Nuro	San Mateo County
CA	LAVTA – Dublin BART Station	Dublin, Bay Area, San Francisco	Shuttle, EASYMILE EZ10 GEN2	Public Street	In-Vehicle Safety Operator	Public	EasyMile	Livermore Amador Valley Transit Authority (LAVTA)
CA	On-Road Testing	San Francisco, California	Car, CHEVROLET BOLT EV	Public Street	In-Vehicle Safety Operator	Employee Riders	Cruise LLC	Cruise
CA	Public Road Testing	San Francisco, California	SUV, VOLVO XC90	Public Street	In-Vehicle Safety Operator	Employee Riders	Uber ATG	
CA	GoMentum Station – Local Motors	Concord, California	Shuttle, LOCAL MOTORS OLLI 1.0	Private Not Specified	In-Vehicle Safety Operator	Test Team Only	Local Motors	Local Motors Inc

State	Project Title	Location	Vehicle	Road	Safety Driver	Use	AV technology	Site Coordinator
CA	Cal Expo – Local Motors	Sacramento, California	Shuttle, LOCAL MOTORS OLLI 1.0	Private Parking Lot	In-Vehicle Safety Operator	Public	Local Motors	Local Motors Inc
CA	Sacramento State – Local Motors	Sacramento, California	Shuttle, LOCAL MOTORS OLLI 1.0	Private University	In-Vehicle Safety Operator	Public	Local Motors	Local Motors Inc
CA	Rancho Cordova, CA – Local Motors	Rancho Cordova, CA	Shuttle, LOCAL MOTORS OLLI 1.0	Private Business Campus	In-Vehicle Safety Operator	Employee Riders	Local Motors	Local Motors Inc
FL	AV Solutions Test Program Jacksonville Transportation Authority	Jacksonville, Florida	Shuttle, Autonom Arma	Private Not Specified	In-Vehicle Safety Operator	Test Team Only	Jacksonville Transportation Authority/Beep	Jacksonville Transportation Authority/Beep
FL	Autonomous Pilot Shuttle With HART	Tampa, Florida	Shuttle, Autonom Arma	Public Street	In-Vehicle Safety Operator	Public	Beep/ NAVYA	Beep
FL	Rain Testing	Miami, Florida	Car	Public Not Specified	In-Vehicle Safety Operator	Test Team Only	Waymo	Waymo

State	Project Title	Location	Vehicle	Road	Safety Driver	Use	AV technology	Site Coordinator
FL	AV Shuttle Network - Aqua Line	Port Saint Lucie, Florida	Shuttle, Autonom Arma	Public Street	In-Vehicle Safety Operator	Public	Beep / NAVYA	Beep
FL	Pilot with Pinellas Suncoast Transit Agency	Saint Petersburg, Florida	Shuttle, Autonom Arma	Public Street	In-Vehicle Safety Operator	Public	NAVYA	Beep
FL	Fully Autonomous Shuttle Transports COVID-19 Tests at Mayo Clinic	Jacksonville, Florida	Shuttle, Autonom Arma	Private Business Campus	Remote Safety Operator	Delivering Goods	Jacksonville Transportation Authority/Beep	Jacksonville Transportation Authority/ Beep
FL	AV Solutions Test Program - FSCJ Cecil Center	Jacksonville, Florida	Shuttle, LOCAL MOTORS OLLI 2.0	Private Street	In-Vehicle Safety Operator	Test Team Only	Robotic Research	Jacksonville Transportation Authority
AZ	Autonomous Shuttle Pilot with City of Peoria	Peoria, Arizona	Shuttle, AUTONOM ARMA	Public Street	In-Vehicle Safety Operator	Public	NAVYA	Beep
AZ	Heavy Truck Testing	Phoenix, Arizona	Heavy Truck	Public Highway	In-Vehicle Safety Operator	Goods delivery	Embark Trucks, Inc.	Embark Trucks, Inc.
AZ	On-Road Testing	Phoenix, Arizona	Car, Chevrolet Bolt EV	Public Street	In-Vehicle Safety Operator	Employee Riders	Cruise LLC	Cruise LLC

State	Project Title	Location	Vehicle	Road	Safety Driver	Use	AV technology	Site Coordinator
AZ	Public Roads Testing	Scottsdale, Arizona	Delivery Robot, NURO R2	Public Street	In-Vehicle or Remote Operator	Test Team Only	Nuro	Nuro
AZ	Waymo Via – Delivery	Chandler, Arizona	Car, Chrysler Pacifica Hybrid	Public Not Specified	In-Vehicle Safety Operator	Goods Delivery	Waymo	Waymo
MI	3M/Michigan Partnership on I-75	I-75	N/A	3.3-mile construction work zone along I-75	N/A	Public	N/A	Michigan DOT
MI	On-Road Testing	Milford, Michigan	Car, Chevrolet Bolt EV	Private Not Specified	In-Vehicle Safety Operator	Test Team Only	Cruise LLC	Cruise LLC
MI	Easymile – Oakland University	Auburn Hills, Michigan	Shuttle, EASYMILE EZ10 GEN2	Private University	In-Vehicle Safety Operator	Public	EasyMile	EasyMile
MI	Winter Weather Testing	Novi, Michigan	Car	Public Not Specified	In-Vehicle Safety Operator	Test Team Only	Waymo	Waymo
MI	AHMT Automated Testing - Farmington Hills, MI	Farmington Hills, MI	SUV	Public Business Campus	In-Vehicle Safety Operator	Public	American HAVAL Motor Technology	American HAVAL Motor Technology

State	Project Title	Location	Vehicle	Road	Safety Driver	Use	AV technology	Site Coordinator
MI	Self-Driving Shuttle Service Launched to Transport Senior Citizens and Underserved to Detroit Hospital	Detroit, Michigan	Shuttle, NAVYA Autonom Shuttle	Public Street	In-Vehicle Safety Operator	Public	NAVYA	NAVYA
MI	On-Road Testing	Dearborn/ Detroit, MI	Car, Ford Fusion Hybrid	Public Street	In-Vehicle Safety Operator	Test Team Only	Argo AI	Argo AI
MI	Testing	Ann Arbor, Michigan	Car, LEXUS	Public Not Specified	In-Vehicle Safety Operator	Test Team Only	Toyota Research Institute	
MI	Driverless Shuttle Service on University of Michigan's North Campus	North Campus, University of Michigan	Shuttle, NAVYA ARMA	Public Not Specified	In-Vehicle Safety Operator	Public	NAVYA	MCity
MI	Yandex AV Testing Michigan	Ann Arbor, MI	Car, Hyundai Sonata	Public Street	In-Vehicle Safety Operator	Test Team Only	Yandex Self Driving	
MI	NAVYA Voluntary Safety Self-Assessment	Saline, Michigan	Shuttle, NAVYA ARMA	Public Not Specified	In-Vehicle Safety Operator	Test Team Only	NAVYA	NAVYA

State	Project Title	Location	Vehicle	Road	Safety Driver	Use	AV technology	Site Coordinator
IA	Smart Infrastructure						Real-time hazard alerts for crashes, weather, work zones, traffic jams, predictive weather and traffic conditions for use by drivers and AVs, real-time data feeds for use by AVs including HD maps for key corridors, automotive-grade information architecture	Iowa DOT
MO	Deployment of Autonomous TMA (MoDOT, 2018).		Autonomous TMAs (Truck Mounted Attenuators).				Autonomous TMAs (Truck Mounted Attenuators)	Missouri DOT
CO	EasyMile - National Renewable Energy Lab (NREL)	Golden, Colorado	Shuttle, Easymile EZ10 GEN1	Private Street	In-Vehicle Safety Operator	Employee Riders	EasyMile	EasyMile
CO	EasyMile - Westminster Food Bank		Shuttle, Easymile EZ10 GEN2	Public Street	Remote Safety Operator	Goods Delivery	EasyMile	EasyMile
CO	EasyMile - 61AV Pena Light Rail Station	Denver, Colorado	Shuttle, Easymile EZ10 GEN1	Public Street	In-Vehicle Safety Operator	Public	EasyMile	EasyMile

State	Project Title	Location	Vehicle	Road	Safety Driver	Use	AV technology	Site Coordinator
VA	VTTI - Automated Shuttle Testing	Blacksburg, Virginia	Shuttle, EASYMILE EZ10 GEN2	Private University	In-Vehicle Safety Operator	Public	EasyMile	VTTI
TX	EasyMile - DFW Airport Parking Lot	Dallas, Texas	Shuttle, EASYMILE EZ10 GEN2	Public Parking Lot	In-Vehicle Safety Operator	Public	EasyMile	EasyMile
TX	Texas A&M Transportation Institute Self-Driving Shuttle Demonstration	College Station, Texas	Shuttle, NAVYA AUTONOM SHUTTLE	Public Street	In-Vehicle Safety Operator	Public road	NAVYA	Texas Transportation Institute (TTI)
TX	Houston Nuro-Domino's R2 Deliveries (Ohnsman, 2021)	Houston, Texas	Delivery Robot, R2	Public Street	N/A	Public	Nuro	Nuro
TX	Public Roads Testing (Holley, 2019)	Houston, Texas	Car, PRIUS	Public Street	In-Vehicle or Remote Operator	Test Team Only	Nuro	Nuro
TX	On Road Testing (Marakby, 2019)	Austin, Texas	Car, FORD FUSION HYBRID	Public Street	In-Vehicle Safety Operator	Test Team Only	Argo AI	Argo AI
TX	World's First Fully Self-Driving Ride on Public Roads	Austin, Texas	Car, WAYMO FIREFLY	Public Street	No	Public	Waymo	Waymo

State	Project Title	Location	Vehicle	Road	Safety Driver	Use	AV technology	Site Coordinator
NY	University at Buffalo - Local Motors (Sadek et al., 2021)	Buffalo, New York		Private University		Test Team Only		University at Buffalo
MA	Public Road Testing	Boston, Massachusetts	Car	Private Not Specified		Test Team Only	Motional	FCA
WI	Driverless Shuttle Delivers Rides at University of Wisconsin-Madison (Ziemer, 2018)	Madison, Wisconsin	Shuttle	Public Street		Public	NAVYA	NAVYA
NE	Autonomous Shuttle Demonstration	Lincoln, Nebraska		Private Parking Lot		Public	NAVYA	NAVYA
OH	EasyMile - Columbus Goods Delivery	Columbus, Ohio		Public Street		Delivering Goods	EasyMile	EasyMile
OH	The Goodyear Tire & Rubber Company (Local Motors, n.d.)	Akron, Ohio	Car	Public Not Specified		Test Team Only	Local Motors	LOCAL MOTORS INC.

State	Project Title	Location	Vehicle	Road	Safety Driver	Use	AV technology	Site Coordinator
PA	Private Track Testing	Pittsburgh, Pennsylvania		Public Street		Public	Uber	Volvo
PA	Public Road Testing	Pittsburgh, Pennsylvania	Car	Public Not Specified		Test Team Only	Motional	FCA
PA	On Road Testing	Pittsburgh, Pennsylvania	Car	Public Street		Employee Riders	Uber ATG	VOLVO CAR CORPORATION
GA	Peachtree Corners (Local Motors, n.d.)	Peachtree Corners, Georgia	Car	Public Street		Public	Local Motors	Local Motors

4.3 List of CV Projects

The list of CV projects currently operational and planned for future deployment is provided in **Table 4.2**.

Table 4.2: State-Wise List of CV Projects

State	Project Title	Location	Status	Brief Description
AZ	Arizona Connected Vehicle Test Bed (Anthem)	11 intersections along 5.5-mile area of West Daisy Mountain Drive, Anthem, AZ with planned expansions along I-17, I-10 and MC-85	Operational	Advance multiple vehicle signal priority technologies in a live traffic environment, demonstrated signal priority and traveler & pedestrian information applications, and integrated I-17 freeway interchange.
AZ	Loop 101 Mobility Project	Loop 101 in Phoenix area, AZ	Planned	The primary goal of the L101 Mobility Project is to implement a Decision Support System (DSS) and provide Integrated Corridor Management (ICM) operations that will help identify and execute arterial detour routes that optimize the use of existing capacity based on real-time data and predicted congestion levels
CA	City of San Francisco Advanced Transportation and Congestion Management Technologies Deployment Initiative (ATCMTD)	San Francisco, CA	Planned	The project will be deploying smart connected traffic signals that will also improve overall efficiency by providing signal preference to priority vehicles, such as emergency vehicles and public transit vehicles.
CA	Contra Costa ATCMTD	Contra Costa, CA	Planned	N/A
CA	Contra Costa ADS	Contra Costa, CA	Planned	N/A
CA	City of Fremont Safe and Smart Corridor	34 intersections along10-miles of Fremont Blvd, Fremont, CA	Planned	The Safe and Smart Corridor project along Fremont Boulevard will deploy available technologies to improve the management of existing and future traffic conditions and ensure safety for all road users.

State	Project Title	Location	Status	Brief Description
CA	California CV Test Bed, Palo Alto	Palo Alto Test Corridor for multi-modal ITS traffic signal system software along Highway 82 also known as El-Camino Real (approximately 2.1 miles)	Operational	Deployment of DSRC units in 11 intersections to test and evaluate multi-modal ITS traffic signal system software
CA	San Jose Connected Vehicle Pilot Study	San Jose, CA	Operational	With support from the US Department of Energy's Small Business Vouchers Pilot program, Connected Signals has launched a study to evaluate the safety and efficiency implications of providing drivers with real-time, predictive information on the state of traffic signals.
CA	Los Angeles DOT Implementation of Advanced Technologies to Improve Safety & Mobility within the Promise Zone	Los Angeles, CA	Planned	The project focuses on large-scale deployment of technology to allow the traffic signal system to detect red light-violating vehicles and adjust timing, to allow personal wireless devices to prioritize pedestrian travel and safety at intersections, and to assist transit bus drivers to operate safely and efficiently.
CA	Freight Advanced Traveler Information System (FRATIS)	Los Angeles, CA	Planned	This project will implement a large-scale deployment of the Freight Advanced Traveler Information System (FRATIS) Project to provide substantial improvements in truck congestion reduction and fuel usage
CA	San Diego 2020 ATCMTD	San Diego, CA	Planned	N/A
CO	Colorado TIGER	Denver, CO	Planned	N/A
CO	Denver ATCMTD Program	Denver, CO	Planned	The project will implement three intelligent vehicle projects: a Connected Traffic Management Center (TMC) and Connected Fleets; Travel Time Reliability as a City Service for Connected Freight; and Safer Pedestrian Crossings for Connected Citizens.

State	Project Title	Location	Status	Brief Description
CO	US RoadX Connected Vehicle Project	I-70 Colorado	Operational	Vehicles participating in the pilot will be able to transmit and receive localized information on current road conditions, improving safety and provide real time information to drivers pertaining to current hazards.
CO	ColoradoDOT Wolf Creek Pass ATCMTD	Portion of Wolf Creek Pass, CO	Planned	N/A
FL	Univ of FL Pedestrian & Bicycle Safety	University of Florida, FL	Planned	The goal of this project is to reduce pedestrian and bicycle crashes and conflicts with vehicles and transit.
FL	Gainesville SPAT Deployment	Gainesville, FL	Operational	27 signals along 4 corridors, Gainesville, FL
FL	Tallahassee US90 SPaT Challenge Deployment	US-90 Mahan Drive, Tallahassee, FL	Operational	22 signals along US-90 Mahan Drive
FL	Jacksonville BUILD	Jacksonville, FL	Planned	N/A
FL	I-75 Frame Ocala	Ocala, FL	Planned	N/A
FL	Lake Mary Blvd CV Project	Lake Mary Blvd, FL	Planned	The Lake Mary Boulevard CV project will deploy, and test connected vehicle technology and applications along seven signalized intersections from International Parkway to Rinehart Road in Lake Mary, Florida.
FL	Seminole County SR 434	Seminole County, FL	Operational	The purpose of this project is to implement CV technology and Signal Performance Metrics (SPM) in Seminole County.

State	Project Title	Location	Status	Brief Description
FL	PedSafe Orlando	Orlando, FL	Planned	Recipient of the Advanced Transportation and Congestion Management Technologies Deployment (ATCMTD) grant for the Connecting the East Orlando Communities project. Connecting the East Orlando Communities represents the Central Florida Automated Vehicle Partners Smart Cities approach consisting of three program areas: PedSafe, GreenWay, and Smart Community
FL	Osceola County CV Signal Project	Osceola County, FL	Operational	The deployment was sponsored by the Federal Highway Administration as a pilot project to test Dedicated Short-Range Communications equipment and intersection processing equipment to gain experience and compile lessons learned in the deployment of CV infrastructure and applications.
FL	Pinellas County SPAT	Pinellas, FL	Operational	Signal Phase and Timing (SPaT) project at 23 traffic signals along a portion of US 19 corridor. 11 traffic signals are at-grade intersections on US 19 and 12 signals are along frontage roads
FL	Tampa Hillsborough Expressway Authority (THEA) Connected Vehicle Deployment	Selmon Expressway, Tampa, FL	Operational	Alleviate congestion and improve safety during morning commuting hours by deploying a variety of connected vehicle technologies on and in the vicinity of reversible express lanes and three major arterials in downtown Tampa.
FL	US98 Smart Bay	Tampa Bay, FL	Planned	The first part of the project consists of upgrading infrastructure by deploying a roadside unit (RSU) along with the onboard unit (OBU) installed in cars, transits, freights, and emergency vehicles. The second part includes the deployment of autonomous shuttles.
FL	Connected Freight Priority System Deployment	Palm Beach, FL	Planned	The scope of work includes the deployment of a combination of Vehicle to Infrastructure (V2I) and Vehicle to Vehicle (V2V) components required for the freight vehicles. The project will integrate several safety and mobility applications including freight signal priority.

State	Project Title	Location	Status	Brief Description
FL	Automated and Connected Vehicle Technologies for Miami's Perishable Freight Industry Pilot Demonstration Project	Miami, FL	Planned	This research & demonstration project will follow a three-phase approach to measure, prioritize and automate portions of the floral delivery supply chain in Miami-Dade County.
FL	US1 Keys Coast	Key Largo, FL	Planned	Add connected vehicle technology along 112.5 miles; Key West to Key Largo; sole access and evacuation route for the Florida Keys. Applications include Pedestrian and cyclist safety, V2V, drawbridge management, emergency vehicle preemption (EVP), freight signal priority (FSP), transit signal priority (TSP), weigh-in-motion (WIM)
GA	iATL CV2X	Alpharetta, GA	Operational	Federal Communications Commission (FCC) issued an experimental license for infrastructure and mobile C-V2X deployments within a five-mile radius of the iATL, located in Alpharetta, GA north of Atlanta
GA	Marietta GA Emergency Vehicle Signal Preemption	Marietta, GA	Operational	The city of Marietta has installed preemption software on Marietta Fire vehicles to give first responders in Marietta green lights at pre-cleared intersections.
GA	North Fulton Community Improvement District	Fulton County, GA	Operational	The installation of a state-of-the-art CV system that will connect 44 contiguous intersections within the North Fulton region.
GA	I-85/"The Ray" CV Testbed	I-85 Georgia	Operational	Six roadside units, which will be deployed along the 18-mile length of the highway, will send information from the connected vehicles to a traffic management platform.
GA	City of Atlanta Smart Corridor Demonstration Project	Atlanta, GA	Operational	North Avenue (from Georgia Tech Campus to Ponce City Market) - 20 intersections. Through the Renew Atlanta program, the City of Atlanta is currently initiating the North Avenue Smart Corridor project.
GA	Gwinnett County CV Project	Gwinnett County, GA	Planned	50 intersections along Peachtree Industrial Blvd in western Gwinnett County

State	Project Title	Location	Status	Brief Description
GA	CV-1K+ Project	Hartsfield Jackson Airport, GA	Planned	Implement connected vehicle technologies operating in the 5.9 GHz safety spectrum at approximately 1000 traffic signal intersections
IN	Indiana DOT SPaT Deployment - Merrillville	Merrillville, IN	Planned	Indiana DOT will deploy SPaT along the US30 West Corridor in Merrillville (approximately 8 intersections)
IN	Indiana DOT SPaT Deployment - Greenwood	Greenwood, IN	Planned	Indiana DOT will deploy SPaT along the US30 West Corridor in Merrillville (approximately 8 intersections)
IN	Indiana Connected Vehicle Corridor Deployment Project	I-94, IN	Operational	N/A
IA	Iowa City ADS	Iowa City, Iowa	Planned	N/A
MA	Hope TEST	Cambridge, MA	Operational	N/A
MI	MI ADS	TBD	Planned	N/A
MI	MI TIGER	TBD	Planned	N/A
MI	Lansing DSRC Deployment	Along West Saginaw Highway/M-43, Lansing, MI	Operational	N/A
MI	MI BUILD	TBD	Planned	N/A

State	Project Title	Location	Status	Brief Description
MI	U.S. Army Tank Automotive Research, Development & Engineering Center (TARDEC) "Planet M Initiative"	St. Clair & Lapeer Counties, MI	Operational	The Army's Tank Automotive Research, Development and Engineering Center (TARDEC) will test connected vehicle technology along a 21-mile portion of I-69 in Michigan (Mich. DOT has installed roadside infrastructure and makes available for testing).
MI	Macomb County Dept. Roads DSRC Deployment (MDOT/SMART Pilot)	Macomb County, MI	Operational	Three (3) year phase deployment of 750 RSU devices at signalized intersections across Macomb County, MI.
MI	I-75 Connected Work Zone (Oakland County)	3 Miles of I-75 in Oakland County, Michigan	Operational	The Michigan Department of Transportation (MDOT) and 3M are partnering to implement connected vehicle technology on a stretch of work zone on Interstate 75 that is more than 3 miles long.The process, aimed at improving driver safety and to test vehicle-to-infrastructure (V2I) technologies, will span four months on the I-75 modernization project work zone in Oakland County
MI	Road Commission for Oakland County DSRC	Farmington Hills, MI	Operational	OEM testing locations
MI	Southeast Michigan Testbed	I-96/I-696, Michigan	Operational	This project will integrate the Ann Arbor Connected Vehicle Test Environment/former Safety Pilot site along with existing infrastructure assets in Farmington Hills, Novi, Southfield and Detroit
MI	Safety Pilot Model Deployment	U.S. 23, Ann Arbor, MI	Operational	Vehicles will be equipped with wireless connected vehicle devices to test safety applications using DSRC between vehicles, while operating on public streets in an area highly concentrated with equipped vehicles
MI	Safety Pilot Model Deployment	Plymouth Road, Ann Arbor, MI	Operational	The model deployment is designed to determine the effectiveness of the technology at reducing crashes.
MI	MCity Testbed	University of Michigan, Ann Arbor, MI	Operational	University of Michigan connected and automated vehicle test bed

State	Project Title	Location	Status	Brief Description
MI	Safety Pilot Model Deployment	Washtenaw Avenue, Ann Arbor, MI	Operational	Vehicles will be equipped with wireless connected vehicle devices to test safety applications using DSRC between vehicles while operating on public streets in an area highly concentrated with equipped vehicles
MI	Ann Arbor Connected Vehicle Test Environment (AACVTE)	Ann Arbor, MI	Operational	UMTRI and its partners will operate, maintain and upgrade this unique connected vehicle test environment for a period of three years (2015-2018). The AACVTE will transition from research mode to operational deployment.
MI	American Center for Mobility (Willow Run)	Ypsilanti Township, MI	Operational	The 300+ acre site will be used as a connected and autonomous vehicle (CAV) testing facility.
MI	Michigan DOT Wayne County Project	Wayne County, MI	Operational	N/A
MI	Smart Belt Coalition (MI)	Ohio, Michigan & Pennsylvania (proposed I-99 Innovation Corridor, AV Proving Grounds (Pittsburgh & PSU)	Planned	A multi-state partnership was formed to allow transportation agencies, academic institutions, and others to work together on connected and automated vehicle initiatives
MI	Michigan DOT I-94 Truck Parking Information & Management System (TPIMS)	Along the I-94 corridor from the Indiana border to US-127 in southwest Michigan	Operational	The project approach is to help mitigate truck parking overcrowding and associated safety concerns by monitoring and managing parking availability and providing timely information to commercial vehicle operators in the I-94 corridor for both public and private truck parking facilities
MO	Kansas City US69 Corridor SPaT Challenge	Kansas City, US69 Corridor, MO	Planned	Deploy SPaT along US69 Corridor with 10+ intersections
MO	St. Louis SPaT Deployment Project	St. Louis, MO	Planned	MDOT will deploy SPaT along portions of Manchester Road (approximately 10 intersections)
MO	Springfield, MO SPaT Project	Springfield, MO	Planned	SPaT will be deployed along Sunshine Street/Campbell Avenue

State	Project Title	Location	Status	Brief Description
NE	NE TIGER	NE	Planned	N/A
NV	RTC 2020 ATCMTD	Las Vegas, NV	Planned	N/A
NV	LV BUILD	Las Vegas, NV	Planned	N/A
NV	Las Vegas SPaT Corridor	Freemont St. Las Vegas, NV	Operational	Broadcasting SPaT and map in support of connected vehicle and autonomous vehicle applications. The DSRC is deployed with the intersections of Las Vegas Boulevard/Fremont, Fremont/6th, Fremont/7th, Fremont/8th, and Carson/7th
NV	Nevada DOT DSRC for Rural ITS (Washoe County)	I-580/Washoe County, NV	Operational	Develop a pilot test corridor for CV that used multimodal (hybrid) communication methods and establish a sustainable platform that is NTCIP compliant that supports DSRC communications.
NY	New York City Connected Vehicle Project Deployment	Manhattan, NYC	Operational	Improve safety and mobility of travelers in New York City through connected vehicle technologies.
NY	New York City Connected Vehicle Project Deployment	Midtown Manhattan, NYC	Operational	Improve safety and mobility of travelers in New York City through connected vehicle technologies.
NY	New York City Connected Vehicle Project Deployment	FDR Drive, NYC	Operational	Improve safety and mobility of travelers in New York City through connected vehicle technologies.
NY	New York City Connected Vehicle Project Deployment	Brooklyn, NY	Operational	Improve safety and mobility of travelers in New York City through connected vehicle technologies
NY	New York State DOT Long Island Expressway INFORM I-495 Demonstration Test Bed	Long Island Expressway at New Hyde Park, NY	Operational	Establish a permanent test bed to demonstrate the capabilities of connected vehicle technologies.

State	Project Title	Location	Status	Brief Description
OH	Ohio Turnpike & Infrastructure Commission DSRC Projects	OH Turnpike, OH	Operational	Proof of concept project to deployment DSRC equipment along a 50-mile section of the Ohio Turnpike.
OH	NW US33 Smart Mobility Corridor	Marysville, OH	Operational	The project will deploy DSRC communications along the US 33 corridor for connected and autonomous vehicle research.
OH	NW US33 Smart Mobility Corridor	Dublin, OH	Operational	The project will deploy DSRC communications along the US 33 corridor for connected and autonomous vehicle research.
OH	City of Columbus - Smart City Challenge	Columbus, OH	Planned	This project will focus on five primary areas with specific technologies designated to improve the region's mobility.
OH	Smart Belt Coalition (OH)	Ohio Department of Transportation (ODOT), Ohio Turnpike and Infrastructure Commission, The Ohio State University and Transportation Research Center	Planned	A multi-state partnership was formed to allow transportation agencies, academic institutions, and others to work together on connected and automated vehicle initiatives. The development of a Strategic Plan will focus on 1) Connected and automated applications in work zones, including uniform work-zone scenarios offering consistency for testers as well as technologies offering better information to motorists. 2) Commercial freight opportunities in testing, including platooning and potential coordination on interstates.
PA	PennDOT Signal Phase and Timing (SPaT) Deployments & Test Beds	Cranberry Township, PA	Operational	Part of Test Bed Program
PA	SmartPGH	Pittsburgh, PA	Operational	Transit signal priority implementation
PA	PennDOT Ross Township Test Bed	Baum Centre Ave Pittsburgh, PA	Operational	The FHWA grant will be used to deploy adaptive traffic signal controls & DSRC along the McKnight Road corridor.

State	Project Title	Location	Status	Brief Description
PA	Smart Belt Coalition (PA)	I-99, PA	Operational	A multi-state partnership was formed to allow transportation agencies, academic institutions, and others to work together on connected and automated vehicle initiatives. The development of a Strategic Plan will focus on 1) Connected and automated applications in work zones, including uniform work-zone scenarios offering consistency for testers as well as technologies offering better information to motorists. 2) Commercial freight opportunities in testing, including platooning and potential coordination on interstates. Incident management applications providing better information and infrastructure for emergency responders and other agencies.
PA	PennDOT Harrisburg Demonstration	Harrisburg, PA	Operational	Provide a successful demonstration of autonomous vehicle technology to Pennsylvania legislators corresponding to pending legislation in the 2015-16 session. Equip a test bed corridor to be used for future testing and demonstrations.
TX	Dallas 2020 ATCMTD	Dallas, TX	Planned	N/A
TX	Arlington Cooper St. CV2X Project	Arlington Cooper St CV2X, TX	Planned	Approximate five-mile (8 km) radius around the heavily traveled Cooper St. corridor where the City Department of Transportation operates 31 traffic signals, two school safety zones, and an at grade railroad crossing.
TX	TX ADS	Texas	Planned	N/A
TX	TX I-10 ATCMTD	Texas	Planned	N/A

State	Project Title	Location	Status	Brief Description
TX	Automated & Connected Vehicle Test Bed to Improve Transit, Bicycle & Pedestrian Safety	Riverside Proving Grounds, Texas A&M Campus, College Station, TX	Planned	The Texas Department of Transportation (TxDOT) has partnered with Texas A&M Transportation Institute (TTI) to establish the Automated and Connected Vehicle (AV/CV) Test Bed to Improve Transit, Bicycle, and Pedestrian Safety.
TX	HOUSTON TIGER	Houston, TX	Planned	N/A
TX	Texas Connected Freight ATCMTD	Houston, TX	Planned	Create a sustainable cv deployment along freight corridors in Houston-Laredo and Dallas-San Antonio, TX
TX	ConnectSmart - Houston	Houston, TX	Planned	The project will deploy an advanced technology platform that integrates Transportation Systems Management & Operations (TSMO) and Active Demand Management (ADM) with multi-modal demand/mobility management.
WA	WSDOT SPaT Projects in Lake Forest Park/Kenmore	Lake Forest Park/Kenmore, WA	Planned	10 intersections along SR-522 north of Lake Washington through the Cities of Lake Forest Park and Kenmore will deploy DSRC for SPaT
WA	WSDOT SPaT Challenge (Poulsbo)	Poulsbo, WA	Planned	SPaT challenge deployments in 6 corridors.
WA	WSDOT SPaT Challenge Project (Spokane)	Spokane, WA	Planned	SPaT challenge deployments in 4 locations
WA	WSDOT SPaT Challenge Project (Vancouver)	Vancouver, WA	Planned	SPaT challenge deployments in 4 locations
WI	Connected Park Street Corridor	Madison, WI	Operational	20 - 30 signalized intersections along Park Street, Madison, WI

Chapter 5: Strategic Priorities of the States

This section summarizes the priorities of states regarding the connected and automated vehicle deployment pathways and policy makings. The key findings are summarized below:

5.1 Key Findings

a) Some states are more focused on CV technologies compared to AV. Also, in many cases, the legislation and testing guidelines do not differentiate between CV and AV operations. States need to initiate efforts to build standards regarding CV/AV operations and testing, leveraging collaboration with industry partners and research institutions.

b) Multiple states, including Florida, Iowa, Michigan, and Ohio, have emphasized the importance of workforce development in transitioning legacy mobility technologies towards connected and automated transportation. Moreover, to meet the potential gap in workforce supply-demand focused on CV/AV technologies, it is necessary to fund workforce development programs as well as education outreach efforts. Some states (e.g., California, Florida, Michigan, Ohio) have started working on the insurance requirement, driver training and education programs.

c) Some states raised concerns about the necessary financial resources to invest in CV/AV infrastructure. Furthermore, distributing CV/AV infrastructure development resources is an ongoing topic, and states are constantly exploring viable solutions.

d) The shift from the DSRC (Dedicated Short-Range Communications) technology to C-V2X (Cellular Vehicle-to-Everything) is causing anxiety in transportation agencies interested in CV/AV technologies and future deployments. Some states are putting significant efforts to bring together all stakeholders—DOTs, automakers, AV operators/service providers, and communications organizations.

e) Only a few CV/AV vision plans addressed the challenge of obtaining public trust and confidence in AV-related services, requiring in-depth research and steps such as opinion-based surveys. Public trust and overall adaptation of the CV/AV technology is critical to achieving the critical mass of CV/AV service users that would make the mobility services economically viable.

f) Although truck platooning has been proven beneficial in CV-based testing sites, only a few states are testing autonomous heavy-duty trucks. In business campuses and busy metropolitan settings, delivery bots, which are typically overlooked in the CAV world, have gained traction.

The following subsections describe state-specific strategic priorities concerning connected and automated vehicle deployment.

5.1.1 California

According to Wong and Shaheen (2020), the state of California may form a multi-year state-level working group comprised of leaders from the public sector, business, non-governmental organizations (NGOs), and academic institutions to advise the governor and legislature on CV/AV policy across various objectives (e.g., land use, data management and collection, safety, environment, social equity, cybersecurity, privacy, public health, and infrastructure needs). Husch and Teigen (2017) list the sectors where California is focusing on changing state laws: law enforcement and emergency response, vehicle registrations, liability, and insurance, education and training, vehicle inspections and maintenance, environmental impacts.

5.1.2 Virginia

The AV strategic plan, developed by the Office of the Secretary of Transportation for the Commonwealth of Virginia and directed by the Office of Intermodal Planning and Investment is expected to support the Commonwealth-wide transportation system goals as stated in VTrans2040 (VDOT, 2020). The plan focused on economic competitiveness and prosperity with objectives—making locations more accessible and linked; guaranteeing safety for all road users; improving proactive system management; and assuring healthy communities and sustainable transportation communities. This AV Strategic Plan is designed to guide the creation of a successful AV program

that includes advances in quality of life, coordinated management of AV-related challenges, responsiveness to emerging technology, and support for AV integration partners. Virginia Connected Corridors (VCC) has prioritized some major CV applications. Some of these are V2V forward collision warning and Emergency Electronic Brake Light, emergency vehicle preemption, red light violation warning system, incident scene alerts for drivers and road users, work zone alerts, and transit signal priorities.

5.1.3 Iowa

Within the context of AV/CV deployments, the recommendation was made that Iowa DOT put lane lines after resurfacing, keep quality lane lines, and eventually use 6-inch lane lines (Iowa DOT & Iowa Advisory Council on Automated Transportation, 2020). The recommendation for signage is to keep it clean and free of obstructions. Reviewing signing and marking processes to ensure consistency in sign type, location, and application is recommended, as well. It is advised to create inventories of CV/AV-prone characteristics (e.g., truck platooning, safety messaging). Documenting the collection of goods and the accuracy of data collecting and reporting is also advised. The main communication infrastructure guideline is to include future communication needs in highway designs and to consult communications vendors.

5.1.4 Missouri

In the future, the State of Missouri is looking towards partnering with TTS (Traffic Technology Services) to provide a better database for future V2I/V2V interaction, according to MoDOT (2018). Missouri has used the 5.9 GHz safety band for V2V communication in the following cases: Kansas City US 69 Corridor SPaT (Signal Phasing and Timing) Challenge; Springfield, MO, SPaT Project, and St. Louis, MO, SPaT Deployment Project (United States Department of Transportation, 2022).

5.1.5 Indiana

As documented in the report by Ukkusuri et al. (2019), INDOT is prioritizing key areas, including the effects of AV-only lanes for trucks and cars, the effects on mobility and safety of a mix of AV classes (cars and trucks); the effects of autonomous intersections; the effects on mobility and safety of truck-only platooning; the effects of dedicated lanes for platooning of trucks

and other heavy vehicles; and the assessment of CV performance. Additionally, a simulation-based platform is suggested to assess future AV/CV deployment cost-benefits in Indiana.

5.1.6 Colorado

Colorado DOT's priority includes installing and improving roadside infrastructure to accommodate connected vehicles throughout the state (Colorado Department of Transportation, n.d.-a). Colorado has also prioritized deploying CV technology capable of communicating with connected vehicles at a large scale. The future development will include heavily used highways like I-25, I-225, I-270, and I-70. Colorado utilized the 5.9 GHz safety bands in initiatives such as Colorado BUILD, Colorado TIGER, Colorado Department of Transportation Wolf Creek Pass ATCMTD, Denver ATCMTD, and the US RoadX Connected Vehicle Project (United States Department of Transportation, 2022).

5.1.7 Oregon

The state of Oregon has a dedicated task force on AVs. According to the task force's suggestions, strategies for mitigating worker displacement, preparing the arriving workforce for new jobs created by the automated vehicle industry, and learning from other industries that have undergone similar transitions, including efficient and inefficient policy interventions, should be included in policy interventions (State of Oregon, 2019). Oregon DOT's recent focus is on monitoring the following AV technologies for the near term in terms of AV deployment: Advanced Traveler Information System (ATIS), Signal Phase and Timing (SPAT), Curve Speed Warning, Motorist Advisories & Warnings (MAW), Freight Dynamic Travel Planning & Response, and Dynamic Speed Harmonization (SPO-HARM). ODOT is also prioritizing some CV technologies for future deployment including ATIS, ramp metering, congestion pricing, smart truck parking and platooning, work zone traveler information, and work zone alerts for incidents (Bertini & Wang, 2016).

5.1.8 Texas

Priorities of the state have been identified in areas such as, increased mobility options for all citizens; opportunities to increase system capacity; opportunities for data-driven development; the potential increase in vehicle miles traveled; the viability of traditional existing transit services

due to the affordability and convenience that will stem from autonomous ride-sourcing; a prominent increase in roadway safety with the associated decrease in crashes; and an extended adoption period for the new technology which will accompany mixed traffic on roadways (Boske, Harrison, Montgomery, & Nath 2014; City of Austin & Capital Metropolitan Transportation Authority, 2017).

5.1.9 New York

The New York City Department of Transportation leads the New York City Pilot, which aims to increase the safety of city commuters and pedestrians by deploying V2V and V2I linked vehicle technology (Intelligent Transportation System Joint Program Office, n.d.). As a pedestrian-heavy city, the Pilot also focuses on reducing vehicle-pedestrian confrontations via in-vehicle pedestrian warnings and an extra V2I/I2V component that will equip roughly 100 pedestrians with personal gadgets that aid them in crossing the street safely. The planned deployment in New York City (NYSAMPO, 2017) offers a great opportunity to test CV technologies and applications in densely spaced crossings typical of a dense urban transportation system. As the New York Association of Metropolitan Planning Organizations (NYSAMPO) (2017) stated, it is important for New York to focus on the stability and robustness of the RSU (Road-Side Units) and OBU (On-Board Unit) platforms when deploying connected vehicle technology, as well as protecting the privacy of fleet owners and participants' personally identifiable information, in order to ensure the safety of large fleets of vehicles and their safety applications.

The University at Buffalo, situated in Buffalo, NY, is exploring the application and practicality of Olli (a low-speed, self-driving shuttle) in twelve different scenarios (Sadek et al., 2021). The results of the surveys conducted on Olli riders, along with other surveys done in the Buffalo-Niagara region, were evaluated to establish the elements that lead to public acceptability of AV technologies. The study also created the *Buffalo Principles* to help with legal and regulatory actions required for long-term testing and deployment of AVs. A small fleet of the self-driving shuttle Olli was developed to serve the first and last mile legs of trips performed by a subset of BNMC workers (Robotics and Automation News, 2018).

5.1.10 Massachusetts

The following strategic recommendations for MassDOT (Massachusetts Department of Transportation) are found in Stamatiadis et al. (2018), which includes: promoting testing of CV/AV technologies to develop valuable skills and expertise that will aid in future CV/AV deployments; modifying driver training, licensing, and registration requirements; encouraging the use of shared AVs (SAVs) by providing appropriate directions/guidelines to ensure a safe and efficient SAV system; and investing in transportation infrastructure.

5.1.11 Wisconsin

To prepare for the future AV world, the Wisconsin Department of Transportation is prioritizing focus on several AV technologies, including sensing procedure and accessories, LIDAR (Light Detection and Ranging), GPS (Global Positioning System), cameras, and other sensors, as well as techniques for testing and validating AV systems, increasing standards, safety protocols, and security, performance metrics of AVs on different terrains, and human-machine interfaces. Interaction with other road users, such as walkers and cyclists, is also emphasized, as are strategies for improving passenger comfort, public perception, and safety (Governor's Steering Committee of Wisconsin, 2018).

5.1.12 Nebraska

At present, NDOT (Nebraska Department of Transportation) has prioritized monitoring the development and use of autonomous vehicles in other states (Piatkowski et al., 2020). It is assumed that the state will begin to experience widespread automation once big tech (communications and telecommunications) companies start investing in the state's infrastructure. Before that happens, the NDOT will continue to track technological advancements and innovations.

5.1.13 Ohio

Ohio is actively engaged in connected vehicle technology through the Connected Vehicle Environment (CVE) Project, funded by the Smart City Challenge. It attempts to reduce high collision rates between cars, bikes, and pedestrians in Columbus (Smart Columbus, n.d.). The linked car environment routes were chosen for their proximity to other initiatives, in addition to area crash data. The Smart Columbus CVE Project will concentrate on the development of CV

infrastructure and applications. CV infrastructure includes roadside devices, onboard equipment, front and backhaul communications, and equipment interfaces. CV-specific applications will be deployed as part of the project, taking advantage of the infrastructure's data to provide real-time safety and mobility services. Ohio has undertaken other projects incorporating connected vehicle technology, which include US 33 smart mobility corridor & UTM research, Cincinnati/Dayton workforce corridor, SmartLane, Ohio turnpike corridor, and lake effect corridor (JobsOhio, n.d.).

In December 2018, DriveOhio, Smart Columbus, and The Ohio State University collaborated to deploy Ohio's first self-driving vehicle (Marbury, n.d.). The shuttles allow locals and guests to learn about self-driving technology. The demonstration will guide future deployments of self-driving vehicle technology in Ohio, including a route planned for a Columbus area sponsored by the USDOT Smart City Challenge grant. The deployment will also help build safety plans, procedures, and other requirements for future self-driving technology deployments in Ohio and across the country.

5.1.14 Pennsylvania

According to the Pennsylvania Turnpike Commission (2017), the Pennsylvania Transportation Center (PTC) is presently optimizing its operational perspective, targets, and objectives, as well as; identifying goals and primary priorities to address with CV technology solutions; integrating PTC's goals into nationally connected vehicle architectures; emphasizing future projects and ensuring funding resources; and specifying plans of action to execute a feasible road map. Some other sectors where PTC has prioritized focus are improving and modifying CV/AV deployment policies, engaging regularly with local and national agencies, advancing collaboration with various stakeholders, looking for attractive alternatives for CV/AV deployment in adverse terrain and weather conditions, looking for measures to ensure funding for increased CV applications through federal and state-level grants, and participating and organizing CV/AV-related seminars.

5.1.15 Oklahoma

In addition to the above-mentioned states, Oklahoma has emphasized learning from other states' practices. They have passed regulations to deploy "Automated sidewalk delivery vehicles/robots," which will allow automated vehicles to deliver goods to consumers' doorsteps (Rattigan, 2021).

5.1.16 Georgia

Georgia's priorities include establishing an Internal AV Organizational Structure, improving GDOT's understanding of AV Technology, managing exogenous AV Technology engagements, data analysis, and performance metrics for AV Technology (Hunter et al., 2018).

5.1.17 Illinois

Illinois Autonomous Vehicles Association (ILAVA) is prioritizing to develop a framework for promoting the future of mobility innovation in Illinois in collaboration with the Illinois Department of Commerce and Economic Opportunity (DCEO) and the Illinois Department of Transportation (IDOT) (State of Illinois, 2019).

5.1.18 Florida

A brief description of the priorities of Florida, which includes improving safety, reducing congestion, and technology in transportation is given by Ponnaluri (2019).

Chapter 6: Educational Outreach

6.1 Key Findings

Many state policies (and vision plans), particularly in the Midwest and South, underscored the economic and technological opportunities of connected and automated transportation systems. A major catalyst for effective CV/AV deployments is workforce development and educational outreach (Wong & Shaheen, 2020). This chapter explores how the states plan to reach out to the general public, policymakers, and transportation professionals to educate about connected and automated vehicle technologies and the future deployment paths.

6.1.1 Florida

The education and outreach program focuses on managing organizational change while also establishing a cohesive narrative consistent with other states and raising awareness about CV/AV's potential (Florida Department of Transportation, 2019). Education and outreach are meant to provide the current and future transportation workforce with increased CV/AV Program knowledge and skills, including, but not limited to, technology, deployment, integration, and software development. The necessity for building an educational outreach campaign to teach transportation planners, managers, engineers, local agencies, and users (the general public, motor carriers and other road users) about the CV/AV Program will be investigated by FDOT (Florida Department of Transportation). Outreach will help system users and stakeholders to understand how CV/AV infrastructure will be installed and operated, as well as the infrastructure needs, standards, ramifications, and issues that come with such deployments.

The expected activities from the educational outreach programs include emphasizing the advantages and trends of CV/AV, recognizing the CV/AV Program's components and functionalities, creating CV/AV case studies and learn from them, demonstrating a thorough grasp of CV/AV design and infrastructure requirements, disseminating information on CV/AV— potential, difficulties, advantages, and perspectives—and collaborating with higher education institutions in Florida, including FAU, FIU, FPU, FSU-FAMU, UCF, UF, UNF, and USF/CUTR.

6.1.2 Georgia

Many government officials and industry professionals anticipate the Georgia DOT to play a significant role in public education by providing knowledge of AV technology and pushing for its use in enhancing road safety (Hunter et al., 2018). It is possible that the general public would be more inclined to accept CV/AV technologies if they get more opportunities to engage with the technology. Georgia DOT may work with the Chamber of Commerce, which may have more resources to devote to public education. Expert opinions were divided on which groups the DOT should educate, with some believing that the DOT should educate the public. However, other experts say that technical expertise is essential to educate legislators. In any case, the educational and outreach initiatives would encourage CV/AV service providers and technology developers to select particular states for operations, thereby leading in economic development. Many experts recommended DOT engineers and the leadership team to attend AV conferences and symposiums. This type of contact allows the DOT to engage with business and form partnerships directly, better preparing the agency for autonomous vehicle deployment (Hunter et al., 2018).

6.1.3 Iowa

The reports from the Iowa Department of Transportation (2019) and the Iowa DOT & Iowa Advisory Council on Automated Transportation (2020), outlined primary areas for the state of Iowa to increase educational and outreach activities regarding AV technology and deployments. The ATC (Automated Transportation Council) is responsible for identifying gaps in stakeholders' knowledge, skills, and abilities (KSAs) and linking resources to bridge those gaps. This ties into education, communications, and outreach (Iowa DOT & Iowa Advisory Council on Automated Transportation, 2020). At the very least, the outreach should lead to:

1. Working to establish channels of communication for active conversation, beyond speculation, about real automated transportation (AT) opportunities, and;

2. Raising awareness of AT in Iowa, the ATC, and what the ATC and DOT might be able to assist with. One of the roles of ATC is to keep stakeholders, decision-makers, and the public informed of AT issues and opportunities as technologies are continually evolving and timelines continue to change, as

outlined in Iowa DOT & Iowa Advisory Council on Automated Transportation (2020). At each council and subcommittee meeting, the ATC should examine networking, engagement, and education needs. ATC is also focused on ensuring fairness and accessibility improvements throughout all automation considerations. Another strategy recommended is to prepare Iowa's regulators and the DOT for future inevitable AV safety challenges. ATC may assist in this area by issuing a news release and developing a scenario strategy.

6.1.4 Michigan

To maintain its lead in educational CV/AV efforts, Michigan is recommended to foster strong industry-academic collaboration, particularly in developing academic programs that meet industry needs (Center for Automotive Research, 2018). Educators may continue to work closely with industry experts to keep courses current and students informed of new CV/AV technological advances. Some community colleges may employ technical councils to stay current with key commercial advances. The region and state are also suggested to assist southeast Michigan community colleges by better aligning their curriculum with corporate demands and building underrepresented programs in computer science, cybersecurity, IT/data management, and software/design. Academic institutions, economic development groups, and other stakeholders are advised to sponsor activities that encourage and support students' entrepreneurial ideas. This proposal from the Center for Automotive Research (2018), includes K–8th graders, especially in science, technology, engineering, and mathematics (STEM). Also, economic and workforce development entities are encouraged to organize, sponsor, or attend CV/AV job fairs. Existing events and recruiting do not adequately handle talent acquisition in this business.

6.1.5 Minnesota

The Minnesota Department of Transportation (MnDOT) would have to provide public information on CV/AV, organize public hearings and listening sessions, and request broad public feedback on CV/AV policies and projects to educate and engage the public on CV/AV per (MnDOT, 2019). Some available recommendations from Hallmark et al. (2019) suggest Minnesota

to create a CV/AV public engagement and communications plan including strategic goals, clients, programs, webinars, and events. A public engagement and communication plan ensures that CV/AV policy and program choices meet Minnesotans' needs and that societies are included in the policy-making process. Minnesota is also suggested to make a strategy to analyze communication and engagement tools, segregate audiences, and message for each community, focusing on those with mobility issues and vulnerable road users.

6.1.6 New York

Good and reliable information sources regarding the safety and function of autonomous vehicles (AVs) are essential for building public confidence in the technology. A forum dedicated to AV research and discussion may be a powerful instrument to raise public awareness of AVs and increase their use. Despite its value in raising public awareness, the forum alone was insufficient in convincing participants that autonomous vehicles are a safe alternative to human-driven vehicles (Sadek et al., 2021). Interaction with a functional AV, like the Olli (a low-speed, self-driving shuttle), is substantially more effective in persuading the public than any other method.

6.1.7 Ohio

To educate and inform the citizens about the benefits and future of autonomous driving technology, Ohio is holding different workshops and webinars with stakeholders from various sectors. For example, Partners for Automated Vehicle Education's (PAVE) first public workshop (virtual), *Helping Ohio Communities Prepare for An Autonomous Future,* was held in May 2021 in collaboration with DriveOhio and Ohio's Transportation Research Center (TRC) (Partners for Automated Vehicle Education, 2021). The workshop's goal was to aid communities in preparing for a future with autonomous vehicles. The workshop discussed how an autonomous car works, followed by an exploration of the various levels of AV technology and a timeline of AV testing. The event also touched on AV safety and regulatory perspectives.

6.1.8 Oregon

Oregon's dedicated task force on automated vehicles made several recommendations, including an assessment of the impact of driver-assistance technologies (SAE Levels 1-2); identification of occupations that are likely to be impacted by the deployment of automated vehicles (i.e. occupants who will lose jobs as well as those who will gain new jobs); information on the effect of automated vehicles with varying levels of automation (SAE Levels 3-5); and identification of co-existing occupations (State of Oregon, 2019). These procedures will assist in teaching local people about the benefits and opportunities associated with evolving autonomous technologies.

6.1.9 Pennsylvania

Pennsylvania DOT is recommended to collaborate with local and state educational institutions to enhance workforce training, as stated in Mashayekh et al. (2014). The next phase should be to increase the DOT's expertise base in CV/AV technology, from early exposure to complete comprehension of CV/AV technologies and concepts. Educating and nurturing leaders within each regional and vocational group would be effective. These education and training activities are expected to be tailored to different stakeholders' needs. To go to the next level, Pennsylvania DOT is recommended to take the following steps: identify and support staff champions, reorganize to reduce stove-piping and authority issues, review CV/AV specialist job demands — in areas such as systems engineering, data analytics and management, communication, and software/hardware — in relation to internal staff availability and make a plan to educate the agency, legislators, and the public about the CV/AV financial model (Lopez et al., 2018).

PennDOT is suggested to routinely review its internal training program and add CV/AV-related curriculum and material. To ensure that workers are adequately trained in CV/AV technologies and concepts, PennDOT should encourage transportation authorities and practitioners to participate in training programs and webinars. Both the federal government and third-party professional organizations like SAE and Institute of Transportation Engineers are sponsoring or planning to assist CV/AV projects (Lopez et al., 2018).

6.1.10 Virginia

The goal of the *education* work package according to Virginia Department of Transportation (VDOT) (2020) is to foster efficient communication between VDOT's staff, partner agencies, industry stakeholders, and the general public about CV/AV advances and education. VDOT's preparations for CV/AVs and changes/upgrades in CV/AV technology will necessitate communication with its workers, partner agencies, industry stakeholders, and the general public. Furthermore, public and stakeholder support, particularly VDOT workers familiar with and trained in CV/AV-related technologies, will be critical for effective CAV deployments.

Within the *education* workstream, VDOT is expected to initiate projects and expand continued efforts to participate in local, state, federal, and industry-level CV/AV dialogues and deployments relating to staff development; monitor domestic and national debates about future workforce and certifications; establish channels of communication between VDOT and the public regarding CV/AV technology (specific VDOT CV/AV initiatives) and CV/AV-related education; and provide advice and training to the existing VDOT workforce.

6.1.11 Texas

Some suggested steps (City of Austin & Capital Metropolitan Transportation Authority, 2017) for the Texas DOT to accelerate the state's AV readiness include engaging the general public, businesses, and tourists on how this technology can meet their needs and meet local issues, allowing lowered or zero parking requirements with TDM (Transportation Demand Management), on-site access to shared mobility assurances, implementing market-based performance pricing for parking, permitting for shared parking between businesses, and improving compact and integrated land use. The TxDOT is educating its citizens on the various technical distinctions between AV and CV.

6.1.12 Indiana

Besides these states, Indiana DOT was recommended to focus on education and outreach among all stakeholders to build synergy, trust, and cooperation (Ukkusuri et al., 2019).

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Appendix: CV/AV Survey Participating Agencies

(Agency Type 1: Freeway; Type 2: Arterial; Type 3: Transit)

Agency State	Metro Area	Agency Name	Agency Type
AL	Birmingham-Hoover, AL	Alabama Department of Transportation - Maintenance Bureau	1
AL	Birmingham-Hoover, AL	City of Birmingham	3
AL	Birmingham-Hoover, AL	Shelby County Highway Department	3
AL	Montgomery, AL	Alabama DOT- 6th Division	3
AL	Montgomery, AL	City of Montgomery	3
AL	Montgomery, AL	Montgomery Area Transit System	2
AL	Huntsville, AL	City of Huntsville	3
AL	Montgomery, AL	East Alabama Regional Planning and Development Commission	2
AR	Little Rock-North Little Rock-Conway, AR	Arkansas Highway and Transportation Department	1
AR	Little Rock-North Little Rock-Conway, AR	Little Rock City	3
AZ	Phoenix-Mesa-Scottsdale, AZ	Arizona DOT	3
AZ	Phoenix-Mesa-Scottsdale, AZ	Chandler City	3
AZ	Phoenix-Mesa-Scottsdale, AZ	Mesa City	3
AZ	Phoenix-Mesa-Scottsdale, AZ	Peoria City	3
AZ	Phoenix-Mesa-Scottsdale, AZ	City of Scottsdale Public Works	3
AZ	Phoenix-Mesa-Scottsdale, AZ	Tempe City	3
AZ	Phoenix-Mesa-Scottsdale, AZ	Glendale City Transportation Department	2
AZ	Phoenix-Mesa-Scottsdale, AZ	Maricopa County Department of Transportation	3
AZ	Phoenix-Mesa-Scottsdale, AZ	Peoria Dial-A-Ride	2
AZ	Phoenix-Mesa-Scottsdale, AZ	Phoenix Public Transit Department	2
AZ	Phoenix-Mesa-Scottsdale, AZ	Town of Gilbert	3
AZ	Tucson, AZ	Pima Association of Government Transportation	3
AZ	Tucson, AZ	Pima County DOT	3
AZ	Tucson, AZ	Tucson City	3
AZ	Tucson, AZ	SunTran	2
CA	Bakersfield, CA	Bakersfield City Public Works	3

Agency State	Metro Area	Agency Name	Agency Type
CA	Fresno, CA	Caltrans District 6	1
CA	Fresno, CA	Fresno City	3
CA	Fresno, CA	Fresno Area Express	2
CA	Los Angeles-Long Beach-Santa Ana, CA	Access Services	2
CA	Los Angeles-Long Beach-Santa Ana, CA	City of Arcadia	2
CA	Los Angeles-Long Beach-Santa Ana, CA	Caltrans District 7 - Los Angeles Transportation Management Center	1
CA	Riverside-San Bernardino-Ontario, CA	Caltrans District 8	1
CA	Riverside-San Bernardino-Ontario, CA	Corona City Transit Service (CCTS)	2
CA	Los Angeles-Long Beach-Santa Ana, CA	City of Costa Mesa	3
CA	Los Angeles-Long Beach-Santa Ana, CA	City of Garden Grove	3
CA	Los Angeles-Long Beach-Santa Ana, CA	Glendale Public Works Traffic Section	3
CA	Los Angeles-Long Beach-Santa Ana, CA	La Mirada Transit	2
CA	Los Angeles-Long Beach-Santa Ana, CA	Long Beach City Traffic Engineering Division	3
CA	Los Angeles-Long Beach-Santa Ana, CA	Los Angeles City DOT	3
CA	Los Angeles-Long Beach-Santa Ana, CA	Los Angeles-Regional Transit Operations	2
CA	Los Angeles-Long Beach-Santa Ana, CA	Pasadena Department of Transportation	3
CA	Los Angeles-Long Beach-Santa Ana, CA	Pomona City Public Works Department	3
CA	Riverside-San Bernardino-Ontario, CA	City of Riverside	3
CA	Los Angeles-Long Beach-Santa Ana, CA	Santa Ana City	3
CA	Los Angeles-Long Beach-Santa Ana, CA	Culver City Department of Transportation	2

Agency State	Metro Area	Agency Name	Agency Type
CA	Los Angeles-Long Beach-Santa Ana, CA	City of Laguna Beach Transit Department	2
CA	Los Angeles-Long Beach-Santa Ana, CA	Los Angeles County Public Works	3
CA	Los Angeles-Long Beach-Santa Ana, CA	Montebello Bus Lines	2
CA	Los Angeles-Long Beach-Santa Ana, CA	Simi Valley Transit	2
CA	Los Angeles-Long Beach-Santa Ana, CA	Gold Coast Transit District	2
CA	Sacramento--Arden-Arcade--Roseville, CA	Sacramento City DOT	3
CA	San Diego-Carlsbad-San Marcos, CA	Caltrans - San Diego District 11 Transportation Management Center	3
CA	San Diego-Carlsbad-San Marcos, CA	Caltrans - San Diego District 11 Transportation Management Center	1
CA	San Diego-Carlsbad-San Marcos, CA	Carlsbad City Public Works	3
CA	San Diego-Carlsbad-San Marcos, CA	El Cajon City, Public Works Department	3
CA	San Diego-Carlsbad-San Marcos, CA	Escondido City	3
CA	San Diego-Carlsbad-San Marcos, CA	San Diego City Traffic Engineering	3
CA	San Diego-Carlsbad-San Marcos, CA	San Diego County	3
CA	San Francisco-Oakland-Fremont, CA	Alameda-Contra Costa Transit	2
CA	San Francisco-Oakland-Fremont, CA	San Francisco Bay Area Rapid Transit (BART)	2
CA	San Francisco-Oakland-Fremont, CA	Caltrans District 4 Transportation Management Center	1
CA	San Francisco-Oakland-Fremont, CA	Caltrans District 4 - Golden Gate Division	3
CA	San Francisco-Oakland-Fremont, CA	Redwood City	3
CA	San Francisco-Oakland-Fremont, CA	San Francisco Municipal Transportation Agency (SFMTA)	3
CA	San Jose-Sunnyvale-Santa Clara, CA	San Jose City DOT	3
CA	San Francisco-Oakland-Fremont, CA	Livermore Amador Valley Transit (LAVTA)	2
CA	San Francisco-Oakland-Fremont, CA	San Francisco Municipal Transportation Agency	2
CA	San Francisco-Oakland-Fremont, CA	San Mateo County Transit District (SamTrans)	2
CA	San Jose-Sunnyvale-Santa Clara, CA	Santa Clara County Roads and Airport Dept	3
CA	San Francisco-Oakland-Fremont, CA	SolTrans (Solano County Transit)	2
CA	San Francisco-Oakland-Fremont, CA	Western Contra Costa Transit Authority	2

Agency State	Metro Area	Agency Name	Agency Type
CA	Sacramento--Arden-Arcade--Roseville, CA	Sacramento Regional Transit District (SRTD)	2
CA	Santa Barbara-Santa Maria-Goleta, CA	Santa Maria City Public Works	3
CA	Stockton, CA	Caltrans- District 10	1
CA	Salinas, CA	Monterey County Resource Management Agency	3
CA	Salinas, CA	Seaside City Public Works	3
CA	San Luis Obispo-Paso Robles, CA	Caltrans- District 5	3
CA	Modesto, CA	Caltrans- District 10	1
CA	San Francisco-Oakland-Fremont, CA	Golden Gate Bridge, Highway and Transportation District	2
CA	Riverside-San Bernardino-Ontario, CA	Riverside Transit Agency	2
CA	Modesto, CA	Modesto Area Express	2
CA	San Francisco-Oakland-Fremont, CA	San Francisco Bay Ferry (under WETA)	2
CO	Denver-Aurora, CO1/	Arvada City	3
CO	Denver-Aurora, CO1/	Aurora City Public Works Department	3
CO	Denver-Aurora, CO1/	Boulder City Public Works	3
CO	Denver-Aurora, CO1/	Denver City and County Public Works	3
CO	Denver-Aurora, CO1/	Greeley City	2
CO	Denver-Aurora, CO1/	Lakewood City Traffic Engineering	3
CO	Denver-Aurora, CO1/	Colorado Department of Transportation	1
CO	Denver-Aurora, CO1	Colorado Department of Transportation	3
CO	Denver-Aurora, CO1	Adams County	3
CO	Denver-Aurora, CO1/	Boulder County Transportation Department	3
CO	Denver-Aurora, CO1/	Douglas County Department of Public Works Engineering	3
CO	Denver-Aurora, CO1/	Jefferson County Transportation and Engineering	3
CO	Denver-Aurora, CO1/	Regional Transportation District	2
CT	Hartford-West Hartford-East Hartford, CT	Greater Hartford Transit District	2
CT	Hartford-West Hartford-East Hartford, CT	East Hartford Town	3
CT	Hartford-West Hartford-East Hartford, CT	Manchester Town	3

Agency State	Metro Area	Agency Name	Agency Type
CT	Hartford-West Hartford-East Hartford, CT	Town of West Hartford	3
CT	New Haven-Milford, CT	Meriden City	3
CT	New Haven-Milford, CT	Greater New Haven Transit District	2
CT	New Haven-Milford, CT	City of West Haven	3
CT	Bridgeport-Stamford-Norwalk, CT	Bridgeport City	3
CT	Bridgeport-Stamford-Norwalk, CT	Stamford City	3
CT	Bridgeport-Stamford-Norwalk, CT	Connecticut Department of Transportation	2
CT	Bridgeport-Stamford-Norwalk, CT	Norwalk Transit District	2
CT	Bridgeport-Stamford-Norwalk, CT	Town of Greenwich	3
CT	Norwich-New London, CT	Norwich Public Utilities	3
DC	Washington-Arlington-Alexandria, DC-VA-MD-WV	District of Columbia DOT	1
DC	Washington-Arlington-Alexandria, DC-VA-MD-WV	Washington Metropolitan Area Transit Authority	2
DE	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	Wilmington City	3
DE	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	Delaware Department of Transportation	3
FL	Jacksonville, FL	Duval County (includes Jacksonville City)	3
FL	Jacksonville, FL	St. Johns County Traffic Division	3
FL	Jacksonville, FL	Florida Department of Transportation	1
FL	Miami-Fort Lauderdale-Pompano Beach, FL	Florida s Turnpike Enterprise	1
FL	Orlando-Kissimmee, FL	Orlando City	3
FL	Orlando-Kissimmee, FL	Orange County Traffic Engineering	3
FL	Orlando-Kissimmee, FL	Osceola County	3
FL	Orlando-Kissimmee, FL	Seminole County Public Works	3
FL	Bradenton-Sarasota-Venice, FL	Manatee County	3
FL	Bradenton-Sarasota-Venice, FL	Manatee County	3
FL	Bradenton-Sarasota-Venice, FL	Manatee County Transit	2
FL	Bradenton-Sarasota-Venice, FL	Sarasota County Transportation	2
FL	Tampa-St. Petersburg-Clearwater, FL	Clearwater City	3

Agency State	Metro Area	Agency Name	Agency Type
FL	Tampa-St. Petersburg-Clearwater, FL	St. Petersburg City	3
FL	Tampa-St. Petersburg-Clearwater, FL	Tampa City	3
FL	Tampa-St. Petersburg-Clearwater, FL	Hillsborough County Engineering & Operations	3
FL	Tampa-St. Petersburg-Clearwater, FL	Pinellas County Traffic Management	3
FL	Tampa-St. Petersburg-Clearwater, FL	Florida DOT - Tampa Bay District 7	1
FL	Tampa-St. Petersburg-Clearwater, FL	Pasco County Public Transportation (PCPT)	2
FL	Miami-Fort Lauderdale-Pompano Beach, FL	Boca Raton City Municipal Services Dept.	3
FL	Miami-Fort Lauderdale-Pompano Beach, FL	Florida Department of Transportation-District 4	1
FL	Miami-Fort Lauderdale-Pompano Beach, FL	Florida DOT -District 6 - SunGuide Transportation Management Center	1
FL	Pensacola-Ferry Pass-Brent, FL	Pensacola City Public Works	3
FL	Pensacola-Ferry Pass-Brent, FL	Escambia County Office of Transportation and Traffic Operations	3
FL	Pensacola-Ferry Pass-Brent, FL	Santa Rosa County Public Works	3
FL	Pensacola-Ferry Pass-Brent, FL	Escambia County Area Transit	2
FL	Deltona-Daytona Beach-Ormond Beach, FL	Volusia County Public Works	3
FL	Cape Coral-Fort Myers, FL	Lee County Transit (LeeTran)	2
GA	Atlanta-Sandy Springs-Marietta, GA	Atlanta City Public Works	3
GA	Atlanta-Sandy Springs-Marietta, GA	Clayton County Department of Transportation & Development	3
GA	Atlanta-Sandy Springs-Marietta, GA	Cobb County Department of Transportation	3
GA	Atlanta-Sandy Springs-Marietta, GA	DeKalb County Traffic Engineering Division	3
GA	Atlanta-Sandy Springs-Marietta, GA	Gwinnett County Department of Transportation	3
GA	Atlanta-Sandy Springs-Marietta, GA	Henry County DOT	3
GA	Atlanta-Sandy Springs-Marietta, GA	Douglas County Georgia Department of Transportation	2
GA	Atlanta-Sandy Springs-Marietta, GA	Fulton County Public Works	3
GA	Atlanta- Sandy Springs - Marietta, GA	Georgia Department of Transportation	3
GA	Atlanta- Sandy Springs - Marietta, GA	Georgia Department of Transportation	1
IA	Des Moines-West Des Moines, IA	Iowa Department of Transportation	1

Agency State	Metro Area	Agency Name	Agency Type
IA	Des Moines-West Des Moines, IA	City of Des Moines Traffic and Transportation	3
IA	Des Moines-West Des Moines, IA	Polk County Public Works	3
ID	Boise City-Nampa, ID	Ada County Highway District	3
ID	Boise City-Nampa, ID	Ada County Highway District	1
ID	Boise City-Nampa, ID	Treasure Valley Transit	2
IL	Chicago-Naperville-Joliet, IL-IN-WI	Chicago DOT	3
IL	Chicago-Naperville-Joliet, IL-IN-WI	Hammond City Engineer	3
IL	Chicago-Naperville-Joliet, IL-IN-WI	City of Joliet, Department of Public Works	3
IL	Chicago-Naperville-Joliet, IL-IN-WI	Waukegan City	3
IL	Chicago-Naperville-Joliet, IL-IN-WI	Cook-DuPage Transportation (CDT)	2
IL	Chicago-Naperville-Joliet, IL-IN-WI	Cook County Highway Department	3
IL	Chicago-Naperville-Joliet, IL-IN-WI	DuPage County Transportation	3
IL	Chicago-Naperville-Joliet, IL-IN-WI	Kane County Transportation	3
IL	Chicago-Naperville-Joliet, IL-IN-WI	Lake County Division of Transportation -Illinois	3
IL	Chicago-Naperville-Joliet, IL-IN-WI	McHenry County Division of Transportation	3
IL	Chicago-Naperville-Joliet, IL-IN-WI	Will County Division of Transportation	3
IL	Chicago-Naperville-Joliet, IL-IN-WI	Chicago Transit Authority (CTA)	2
IL	Chicago-Naperville-Joliet, IL-IN-WI	Illinois Department of Transportation, Region One	1
IL	Chicago-Naperville-Joliet, IL-IN-WI	Illinois Department of Transportation, Region One	3
IL	Chicago-Naperville-Joliet, IL-IN-WI	Mount Prospect Village	3
IL	Chicago-Naperville-Joliet, IL-IN-WI	Oak Park Village Public Works	3
IL	Chicago-Naperville-Joliet, IL-IN-WI	Village of Schaumburg Transportation Department	3
IL	Chicago-Naperville-Joliet, IL-IN-WI	Skokie Village	3
IL	St. Louis, MO-IL	Metro (Bi-State Development Agency)	2
IL	St. Louis, MO-IL	St. Charles City Public Works	3
IL	St. Louis, MO-IL	St. Louis City	3
IL	St. Louis, MO-IL	Franklin County	3
IL	St. Louis, MO-IL	Jefferson County Public Works	3
IL	St. Louis, MO-IL	St. Charles County	3
IL	St. Louis, MO-IL	Illinois Department of Transportation	1

Agency State	Metro Area	Agency Name	Agency Type
IL	St. Louis, MO-IL	Illinois Department of Transportation	3
IL	St. Louis, MO-IL	MoDOT Highway Safety & Traffic Division	1
IN	Chicago-Naperville-Joliet, IL-IN-WI	INDOT Traffic Management	1
IN	Chicago-Naperville-Joliet, IL-IN-WI	North Township of Lake County	2
IN	Chicago-Naperville-Joliet, IL-IN-WI	PACE	2
IN	Indianapolis-Carmel, IN	Boone County Highway Department	3
IN	Fort Wayne, IN	Fort Wayne City Public Works	3
IN	Fort Wayne, IN	Fort Wayne Public Transportation (Citilink)	2
KS	Wichita, KS	Wichita Area Metropolitan Planning Organization	2
KS	Kansas City, MO-KS	Kansas City -Kansas UG of Wyandotte County	3
KY	Louisville/Jefferson County, KY-IN	Louisville Jefferson County Metro Government	3
KY	Louisville/Jefferson County, KY-IN	Kentucky Transportation Cabinet	1
KY	Louisville/Jefferson County, KY-IN	Transit Authority of River City (TARC)	2
LA	Baton Rouge, LA	Capital Area Transit (CATS)	2
LA	Baton Rouge, LA	Baton Rouge/East Baton Rouge Parish	3
LA	New Orleans-Metairie-Kenner, LA	Greater New Orleans Expressway Commission	1
LA	New Orleans-Metairie-Kenner, LA	Jefferson Parish	3
LA	New Orleans-Metairie-Kenner, LA	Louisiana Department of Transportation and Development DOTD HQ Annex	3
LA	New Orleans-Metairie-Kenner, LA	Jefferson Parish Transit	2
LA	New Orleans-Metairie-Kenner, LA	St. Bernard Urban Rapid Transit (SBURT)	2
MA	Boston-Cambridge-Quincy, MA-NH	Boston City	3
MA	Boston-Cambridge-Quincy, MA-NH	Cambridge City	3
MA	Boston-Cambridge-Quincy, MA-NH	Lynn City Public Works	3
MA	Boston-Cambridge-Quincy, MA-NH	City of Newton	3
MA	Boston-Cambridge-Quincy, MA-NH	Quincy City	3
MA	Boston-Cambridge-Quincy, MA-NH	Massachusetts Department of Transportation - Highway Division	1
MA	Boston-Cambridge-Quincy, MA-NH	Framingham Town	3
MA	Boston-Cambridge-Quincy, MA-NH	Weymouth Police Traffic Division	3
MA	Providence-New Bedford-Fall River, RI-MA	Fall River City	3

Agency State	Metro Area	Agency Name	Agency Type
MA	Providence-New Bedford-Fall River, RI-MA	Pawtucket City	3
MA	Providence-New Bedford-Fall River, RI-MA	Greater Attleboro-Taunton Regional Transit Authority	2
MA	Providence-New Bedford-Fall River, RI-MA	Rhode Island Department of Transportation	1
MA	Springfield, MA	Chicopee City, Engineering Dept.	3
MA	Springfield, MA	Springfield City Public Works	3
MD	Baltimore-Towson, MD	Harford Transit Link	2
MD	Baltimore-Towson, MD	Howard County Department of Public Works	3
MD	Washington-Arlington-Alexandria, DC-VA-MD-WV	Montgomery County DOT	3
MD	Washington-Arlington-Alexandria, DC-VA-MD-WV	Prince Georges County Dept of Public Works & Transportation	3
MI	Detroit-Warren-Livonia, MI	Ann Arbor Transportation Authority	2
MI	Detroit-Warren-Livonia, MI	Ann Arbor City	3
MI	Detroit-Warren-Livonia, MI	Detroit City Public Works Department	3
MI	Detroit-Warren-Livonia, MI	Royal Oak City	3
MI	Detroit-Warren-Livonia, MI	Livingston County Road Commission	3
MI	Detroit-Warren-Livonia, MI	Monroe County Road Commission	3
MI	Detroit-Warren-Livonia, MI	St. Clair County Road Commission	3
MI	Detroit-Warren-Livonia, MI	Macomb County Department of Roads	3
MI	Detroit-Warren-Livonia, MI	Road Commission for Oakland County	3
MI	Detroit-Warren-Livonia, MI	Suburban Mobility Authority for Regional Transportation (SMART)	2
MI	Detroit-Warren-Livonia, MI	Washtenaw County Road Commission	3
MI	Grand Rapids-Wyoming, MI	The Rapid - Interurban Transit Partnership	2
MI	Grand Rapids-Wyoming, MI	Ottawa County Road Commission	3
MI	Detroit-Warren-Livonia, MI	Detroit City Department of Transportation	2
MN	Minneapolis-St. Paul-Bloomington, MN-WI	Bloomington City Public Works	3
MN	Minneapolis-St. Paul-Bloomington, MN-WI	Anoka County Highway Department	3

Agency State	Metro Area	Agency Name	Agency Type
MN	Minneapolis-St. Paul-Bloomington, MN-WI	Dakota County Transportation Department	3
MN	Minneapolis-St. Paul-Bloomington, MN-WI	Ramsey County	3
MN	Minneapolis-St. Paul-Bloomington, MN-WI	Scott County Public Works	3
MN	Minneapolis-St. Paul-Bloomington, MN-WI	Washington County	3
MN	Minneapolis-St. Paul-Bloomington, MN-WI	Minnesota Department of Transportation	3
MN	Minneapolis-St. Paul-Bloomington, MN-WI	Metro Transit Control Center	2
MO	Kansas City, MO-KS	Kansas City - Missouri Department of Public Works	3
MO	Kansas City, MO-KS	Olathe City	3
MO	Kansas City, MO-KS	Overland Park City	3
MO	Kansas City, MO-KS	Missouri Department of Transportation	1
MO	Kansas City, MO-KS	Missouri Department of Transportation	3
MO	Springfield, MO	Springfield (MO) City Public Works	3
MO	Springfield, MO	MoDOT Highway Safety & Traffic Division	1
MO	Springfield, MO	City Utilities Transit Services of Springfield, MO	2
MS	Jackson, MS	Mississippi Department of Transportation	1
NC	Charlotte-Gastonia-Concord, NC-SC	Charlotte Department of Transportation	3
NC	Greensboro-High Point, NC	Greensboro City DOT	3
NC	Greensboro-High Point, NC	High Point City	3
NC	Greensboro-High Point, NC	City of Greensboro/Greensboro Transit Agency	2
NC	Greensboro-High Point, NC	North Carolina DOT for Randolph County	3
NC	Durham, NC	Durham Area Transit Authority	2
NC	Greenville, NC	North Carolina DOT	3
NC	Greenville, NC	City of Greenville	3
NC	Asheville, NC	Asheville Transit System	2
NC	Greenville, NC	Greenville Area Transit	2
NC	Charlotte-Gastonia-Concord, NC-SC	Gastonia City Traffic Engineering	3
NE	Omaha-Council Bluffs, NE-IA	City of Council Bluffs	3

Agency State	Metro Area	Agency Name	Agency Type
NE	Omaha-Council Bluffs, NE-IA	Omaha City Public Works Department	3
NE	Omaha-Council Bluffs, NE-IA	Omaha Transit Authority	2
NJ	Allentown-Bethlehem-Easton, PA-NJ	Allentown City Traffic Signal Maintenance	3
NJ	New York-Northern New Jersey-Long Island, NY-NJ-PA	New Rochelle City Public Works	3
NJ	New York-Northern New Jersey-Long Island, NY-NJ-PA	Newark City	3
NJ	New York-Northern New Jersey-Long Island, NY-NJ-PA	Union City - New Jersey	3
NJ	New York-Northern New Jersey-Long Island, NY-NJ-PA	Bergen County Planning and Engineering	3
NJ	New York-Northern New Jersey-Long Island, NY-NJ-PA	Essex County DPW	3
NJ	New York-Northern New Jersey-Long Island, NY-NJ-PA	Middlesex County	3
NJ	New York-Northern New Jersey-Long Island, NY-NJ-PA	Monmouth County Traffic Engineer	3
NJ	New York-Northern New Jersey-Long Island, NY-NJ-PA	Ocean County Engineering Department	3
NJ	New York-Northern New Jersey-Long Island, NY-NJ-PA	Huntington Area Rapid Transit (HART)	2
NJ	New York-Northern New Jersey-Long Island, NY-NJ-PA	Jersey City Public Works Department	3
NJ	New York-Northern New Jersey-Long Island, NY-NJ-PA	MTA Metro-North Railroad	2
NJ	New York-Northern New Jersey-Long Island, NY-NJ-PA	Nice Bus operated by TransDev	2
NJ	New York-Northern New Jersey-Long Island, NY-NJ-PA	Nassau County Traffic Management	3
NJ	New York-Northern New Jersey-Long Island, NY-NJ-PA	New Jersey Turnpike Authority - Operations Department	1
NJ	New York-Northern New Jersey-Long Island, NY-NJ-PA	Palisades Interstate Park Commission	1
NJ	New York-Northern New Jersey-Long Island, NY-NJ-PA	TRANSCOM	1
NJ	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	Gloucester Township	3

Agency State	Metro Area	Agency Name	Agency Type
NJ	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	Burlington County Engineer's Office	3
NJ	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	Camden County Highway	3
NJ	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	New Jersey Turnpike Authority - Operations Department	1
NJ	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	South Jersey Transportation Authority	1
NJ	New York-Northern New Jersey-Long Island, NY-NJ-PA	Hudson County Engineer	3
NM	Albuquerque, NM	Bernalillo County Traffic Engineering Public Works	3
NM	Albuquerque, NM	Rio Rancho City for Sandoval County - Department of Public Works Engineering	3
NM	Albuquerque, NM	New Mexico DOT - District 3	1
NV	Las Vegas-Paradise, NV	Regional Transportation Com of Southern Nevada (Clark County)	3
NV	Las Vegas-Paradise, NV	Nevada Department of Transportation	1
NV	Reno-Sparks, NV	Sparks City Public Works	3
NY	Albany-Schenectady-Troy, NY	Albany City Traffic Engineering	3
NY	Albany-Schenectady-Troy, NY	New York State Thruway Authority	1
NY	Albany-Schenectady-Troy, NY	Saratoga County	3
NY	Albany-Schenectady-Troy, NY	Troy City	3
NY	Buffalo-Niagara Falls, NY	Niagara Falls City Traffic Engineering	3
NY	Buffalo-Niagara Falls, NY	Cheektowaga Town	3
NY	New York-Northern New Jersey-Long Island, NY-NJ-PA	New York State DOT - Hudson Valley - Region 8	1
NY	New York-Northern New Jersey-Long Island, NY-NJ-PA	Putnam County Transit	2
NY	New York-Northern New Jersey-Long Island, NY-NJ-PA	Babylon Town Engineer	3
NY	New York-Northern New Jersey-Long Island, NY-NJ-PA	Town of Clarkstown	3
NY	New York-Northern New Jersey-Long Island, NY-NJ-PA	Town of Huntington	3
NY	New York-Northern New Jersey-Long Island, NY-NJ-PA	Westchester County Department of Public Works	3

Agency State	Metro Area	Agency Name	Agency Type
NY	Rochester, NY	Monroe County DOT	3
NY	Rochester, NY	New York State DOT - Rochester - Region 4	1
NY	Rochester, NY	Rochester-Genesee Regional Transportation Service	2
NY	Syracuse, NY	New York State DOT - Syracuse - Region 3	1
NY	Syracuse, NY	Onondaga County	3
NY	New York-Northern New Jersey-Long Island, NY-NJ-PA	New York State DOT - Long Island - Region 10	3
NY	New York-Northern New Jersey-Long Island, NY-NJ-PA	Long Island Railroad Company	2
NY-NJ	New York-Northern New Jersey-Long Island, NY-NJ-PA	Port Authority of NY & NJ	1
NY-NJ	New York-Northern New Jersey-Long Island, NY-NJ-PA	Coach USA/Rockland Coach	2
OH	Cincinnati-Middletown, OH-KY-IN	City of Cincinnati, Traffic Engineering Division	3
OH	Cincinnati-Middletown, OH-KY-IN	Butler County Engineer	3
OH	Cincinnati-Middletown, OH-KY-IN	Clermont County	3
OH	Cincinnati-Middletown, OH-KY-IN	Hamilton County Engineers Office	3
OH	Cincinnati-Middletown, OH-KY-IN	Warren County	3
OH	Cincinnati-Middletown, OH-KY-IN	MetroSORTA	2
OH	Cleveland-Elyria-Mentor, OH	Cleveland Heights City	3
OH	Cleveland-Elyria-Mentor, OH	Elyria City	3
OH	Cleveland-Elyria-Mentor, OH	Lakewood City	3
OH	Cleveland-Elyria-Mentor, OH	Lorain City	3
OH	Cleveland-Elyria-Mentor, OH	Geauga County	3
OH	Cleveland-Elyria-Mentor, OH	Lake County	3
OH	Akron, OH	Ohio Turnpike Commission	1
OH	Columbus, OH	Columbus City, Division of Traffic Management	3
OH	Columbus, OH	Franklin County	3
OH	Dayton, OH	Dayton City	3
OH	Dayton, OH	Kettering City	3
OH	Dayton, OH	Springfield City	3
OH	Dayton, OH	Miami County Engineers Office	3

Agency State	Metro Area	Agency Name	Agency Type
OH	Dayton, OH	Springfield City Area Transit (SCAT)	2
OH	Toledo, OH	Lucas County Engineering	3
OH	Toledo, OH	Ohio Turnpike Commission	1
OH	Toledo, OH	Toledo Area Regional Transit Authority (TARTA)	2
OH	Youngstown-Warren-Boardman, OH-PA	Warren City	3
OH	Youngstown-Warren-Boardman, OH-PA	Youngstown City Public Works	3
OH	Youngstown-Warren-Boardman, OH-PA	Mahoning County	3
OH	Youngstown-Warren-Boardman, OH-PA	Western Reserve Transit Authority (WRTA)	2
OH	Akron, OH	DriveOhio	3
OK	Oklahoma City, OK	Central Oklahoma Transportation and Parking Authority	2
OK	Oklahoma City, OK	Edmond City	3
OK	Oklahoma City, OK	Oklahoma City Public Works	3
OK	Oklahoma City, OK	City of Norman	3
OK	Oklahoma City, OK	Oklahoma DOT	1
OK	Tulsa, OK	Tulsa City	3
OK	Tulsa, OK	Tulsa County	3
OK	Tulsa, OK	Tulsa Transit	2
OR	Portland-Vancouver-Beaverton, OR-WA	Beaverton City	3
OR	Portland-Vancouver-Beaverton, OR-WA	Clackamas County	3
OR	Portland-Vancouver-Beaverton, OR-WA	Oregon Department of Transportation	1
OR	Portland-Vancouver-Beaverton, OR-WA	TriMet	2
OR	Eugene-Springfield, OR	Oregon DOT	1
OR	Eugene-Springfield, OR	Oregon DOT - Region 2	3
OR	Eugene-Springfield, OR	Lane County Public Works	3
OR	Eugene-Springfield, OR	Lane Transit District	2

Agency State	Metro Area	Agency Name	Agency Type
PA	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	Abington Township Public Works	3
PA	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	Bensalem Township Public Works	3
PA	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	Bristol Township Public Works	3
PA	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	Mercer County	3
PA	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	Pennsylvania DOT -District 6	1
PA	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	Philadelphia Streets Department	3
PA	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	Upper Darby Township	3
PA	Pittsburgh, PA	ACCESS Transportation Systems	2
PA	Pittsburgh, PA	Beaver County Transit Authority (BCTA)	2
PA	Pittsburgh, PA	Westmoreland County Public Works	3
PA	Pittsburgh, PA	Westmoreland County Transit Authority	2
PA	Scranton--Wilkes-Barre, PA	Lackawanna County Transit System (COLTS)	2
PA	Scranton--Wilkes-Barre, PA	Luzerne County Transit Authority (LCTA)	2
PA	Allentown-Bethlehem-Easton, PA-NJ	Pennsylvania DOT	1
PA	Lancaster, PA	South Central Transit Authority (SCTA)	2
PA	Lancaster, PA	Lancaster City Public Works	3
SC	Charleston-North Charleston-Summerville, SC	Berkeley-Charleston-Dorchester Council of Governments	2
SC	Charleston-North Charleston-Summerville, SC	South Carolina Department of Transportation	1
SC	Charleston-North Charleston-Summerville, SC	South Carolina Department of Transportation	3
SC	Charlotte-Gastonia-Concord, NC-SC	South Carolina Department of Transportation	1
SC	Greenville-Mauldin-Easley, SC	City of Greenville	3
SC	Greenville-Mauldin-Easley, SC	Spartanburg City Traffic Engineering	3
SC	Greenville-Mauldin-Easley, SC	Greenville Transit Authority (GTA)	2
SC	Greenville-Mauldin-Easley, SC	South Carolina Department of Transportation	1
SC	Columbia, SC	South Carolina Department of Transportation	1

Agency State	Metro Area	Agency Name	Agency Type
TN	Knoxville, TN	Knoxville City	3
TN	Knoxville, TN	Blount County Highway Department	3
TN	Knoxville, TN	Knox County Engineering & Public Works	3
TN	Knoxville, TN	Knoxville Area Transit	2
TN	Memphis, TN-MS-AR	Memphis City	3
TN	Nashville-Davidson--Murfreesboro, TN	Rutherford County	3
TN	Nashville-Davidson--Murfreesboro, TN	Tennessee Department of Transportation	1
TN	Chattanooga, TN-GA	City of Chattanooga	3
TN	Chattanooga, TN-GA	Tennessee Department of Transportation	1
TN	Chattanooga, TN-GA	Chattanooga Area Regional Transit Authority (CARTA)	2
TX	Austin-Round Rock, TX	Texas Department of Transportation Austin District	1
TX	Dallas-Fort Worth-Arlington, TX	City of Arlington, Public Works & Transportation	3
TX	Dallas-Fort Worth-Arlington, TX	Dallas City	3
TX	Dallas-Fort Worth-Arlington, TX	Garland City Transportation Department	3
TX	Dallas-Fort Worth-Arlington, TX	Mesquite City	3
TX	Dallas-Fort Worth-Arlington, TX	Plano City	3
TX	Dallas-Fort Worth-Arlington, TX	Denton County Transportation Authority	2
TX	Dallas-Fort Worth-Arlington, TX	Texas DOT - Dallas District	1
TX	Dallas-Fort Worth-Arlington, TX	Texas DOT - Dallas District	3
TX	Dallas-Fort Worth-Arlington, TX	Grand Prairie City	2
TX	El Paso, TX	El Paso City Traffic Engineer	3
TX	El Paso, TX	Sun Metro -Mass Transit El Paso City	2
TX	Houston-Sugar Land-Baytown, TX	Fort Bend County Engineering	3
TX	Houston-Sugar Land-Baytown, TX	Montgomery County	3
TX	Houston-Sugar Land-Baytown, TX	Harris County Traffic Engineering Texas DOT	3
TX	Houston-Sugar Land-Baytown, TX	METRO Metropolitan Transit Authority of Harris Co	2
TX	Houston-Sugar Land-Baytown, TX	Texas Department of Transportation	3
TX	Houston-Sugar Land-Baytown, TX	Texas Department of Transportation	1
TX	San Antonio, TX	San Antonio City	3

Agency State	Metro Area	Agency Name	Agency Type
TX	San Antonio, TX	Texas DOT TransGuide	3
TX	San Antonio, TX	Texas DOT - TransGuide Operations Center	1
TX	Dallas-Fort Worth-Arlington, TX	Denton City	3
TX	McAllen-Edinburg-Mission, TX	Texas DOT	1
TX	Beaumont-Port Arthur, TX	Port Arthur City Public Works	3
TX	Austin-Round Rock, TX	TxDOT Traffic Safety Division	1
UT	Salt Lake City, UT	Salt Lake City Transportation	3
UT	Salt Lake City, UT	Utah Transit Authority	2
UT	Ogden-Clearfield, UT	Weber County Engineering	3
UT	Provo-Orem, UT	Provo City Public Works	3
UT	Provo-Orem, UT	Orem City Public Works Dept.	3
VA	Virginia Beach-Norfolk-Newport News, VA-NC	Newport News City	3
VA	Virginia Beach-Norfolk-Newport News, VA-NC	Norfolk City Department of Transit	3
VA	Virginia Beach-Norfolk-Newport News, VA-NC	Virginia Beach City, Strategic Growth Areas Office	3
VA	Richmond, VA	Richmond City	3
VA	Richmond, VA	Henrico County Public Works	3
VA	Washington-Arlington-Alexandria, DC-VA-MD-WV	Alexandria City	3
VA	Washington-Arlington-Alexandria, DC-VA-MD-WV	Arlington County Traffic Engineering Division	3
VA	Washington-Arlington-Alexandria, DC-VA-MD-WV	Fairfax Connector Bus System	2
VA	Washington-Arlington-Alexandria, DC-VA-MD-WV	Potomac and Rappahannock Transportation Commission	2
VA	Washington-Arlington-Alexandria, DC-VA-MD-WV	Virginia Department of Transportation	3
VA	Virginia Beach-Norfolk-Newport News, VA-NC	Virginia Department of Transportation	1
VA	Roanoke, VA	Roanoke City Public Works Transportation Division	3
VA	Roanoke, VA	Virginia DOT	3
WA	Portland-Vancouver-Beaverton, OR-WA	Clark County Public Works	3

Agency State	Metro Area	Agency Name	Agency Type
WA	Portland-Vancouver-Beaverton, OR-WA	Washington County Land Use and Transportation	3
WA	Seattle-Tacoma-Bellevue, WA	Bellevue City	3
WA	Seattle-Tacoma-Bellevue, WA	Seattle Department of Transportation	3
WA	Seattle-Tacoma-Bellevue, WA	Tacoma City Public Works Department	3
WA	Seattle-Tacoma-Bellevue, WA	Pierce County Public Works & Utilities	3
WA	Seattle-Tacoma-Bellevue, WA	Everett City	3
WA	Seattle-Tacoma-Bellevue, WA	Everett Transit	2
WA	Seattle-Tacoma-Bellevue, WA	Federal Way City Traffic Engineering	3
WA	Seattle-Tacoma-Bellevue, WA	King County Metro Transit	2
WA	Seattle-Tacoma-Bellevue, WA	King County DOT	3
WA	Seattle-Tacoma-Bellevue, WA	Pierce Transit	2
WA	Seattle-Tacoma-Bellevue, WA	Community Transit Snohomish County Public Transportation	2
WA	Seattle-Tacoma-Bellevue, WA	Snohomish County Public Works	3
WA	Seattle-Tacoma-Bellevue, WA	Washington State Ferries	2
WA	Seattle, Tacoma, WA	Washington State Department of Transportation	1
WA	Bellingham, WA	Washington State DOT	3
WA	Bellingham, WA	City of Bellingham	3
WA	Bellingham, WA	Whatcom Transportation Authority	2
WA	Spokane, WA	Washington State Department of Transportation	3
WA	Spokane, WA	Washington State Department of Transportation	1
WA	Spokane, WA	Spokane Transit Authority	2
WA	Janesville, WI	Wisconsin Department of Transportation	1
WA	Janesville, WI	Janesville City Public Works	3
WA	Janesville, WI	Janesville Transit System	2
WA	Spokane, WA	Spokane County Public Works	3
WI	Milwaukee-Waukesha-West Allis,WI	Kenosha City	3
WI	Milwaukee-Waukesha-West Allis,WI	Milwaukee City	3
WI	Milwaukee-Waukesha-West Allis,WI	Racine City	3
WI	Milwaukee-Waukesha-West Allis,WI	Waukesha City	3

Agency State	Metro Area	Agency Name	Agency Type
WI	Milwaukee-Waukesha-West Allis,WI	West Allis City	3
WI	Milwaukee-Waukesha-West Allis,WI	Kenosha County Public Works	3
WI	Milwaukee-Waukesha-West Allis,WI	Kenosha Area Transit	2
WI	Milwaukee-Waukesha-West Allis,WI	Milwaukee County Department of Transportation	3
WI	Milwaukee-Waukesha-West Allis,WI	Ozaukee County	3
WI	Milwaukee-Waukesha-West Allis,WI	Waukesha County Department of Public Works	3
WI	Milwaukee-Waukesha-West Allis,WI	Wisconsin Department of Transportation	1
WV	Washington-Arlington-Alexandria, DC-VA-MD-WV	Virginia Department of Transportation	3

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KANSAS TRANSPORTATION RESEARCH
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