COMMONWEALTH of VIRGINIA

AUTONOMOUS DRIVING WORKGROUP

Nicholas Donohue
Secretary of Transportation

1221 East Broad Street
Richmond, Virginia 23219

(804) 786-8032

Autonomous Driving Workgroup

2025 Va. Acts ch. 498 (HB2627) & 2026 Va, Acts ch. 738 (HB1124)

May 22, 2026 Meeting

Location: VDOT Lockwood, Auditorium
9120 Lockwood Blvd, Mechanicsville, VA 23116

Agenda

1:00 – 1:05 pm	Welcome / Opening remarks *Office of the Secretary of Transportation*
1:05 – 1:10 pm	Administrative matters / approvals: - April 2026 meeting minutes - policy on remote participation by members *Joshua Heslinga, VDOT*
1:10 – 1:20 pm	Introduction of labor & workforce impact consultants and plans *Office of the Secretary of Transportation & Knowledge Advisory Group*
1:20 – 2:45 pm	Issues and gap analysis *(discussion, facilitated by VTTI and agency representatives)*
2:45 – 3 pm	Public comment *(in-person only, sign up at the meeting)*

Notes:

- Meeting information is posted on the Commonwealth Calendar and LIS.
  (Past meeting pages have video and materials links – see the April 2026 meeting page.)
- Will be livestreamed on YouTube.com/@VDOTLIVE
  (and video available for viewing there afterward)
- Written comments may be submitted and viewed at
  https://publicinput.com/autonomousdriving
- Administrative questions about the meeting may be sent to
  joshua.heslinga@vdot.virginia.gov and ttrimble@vtti.vt.edu

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2025 Va. Acts ch. 498 (HB2627)

April 24, 2026 Meeting

Minutes – DRAFT

Meeting date, time, and location:

Friday, April 24, 2026, 1 pm
VDOT Lockwood Auditorium, 9120 Lockwood Blvd, Mechanicsville, VA 23116

Workgroup convened by:

Deputy Secretary of Transportation Laura Schewel

Workgroup members present:

Senator Lamont Bagby
Senator J.D. "Danny" Diggs
Senator Kannan Srinivasan
Delegate David Reid
Delegate Jackie Hope Glass
Delegate Brianna Sewell
Virginia State Police (Major Ron Maxey)
Virginia Department of Motor Vehicles
(Assistant Commissioner Patrick Harrison)
Virginia Department of Transportation
(Assistant State Traffic Operations Engineer Mena Lockwood)

Workgroup members absent:

Delegate Terry Austin
Delegate Jason Ballard

Summary:

This was the Work Group's first meeting of 2026.

Attendees were not required to sign in, but a wide range of stakeholders were present, including representatives of autonomous driving companies and technology associations, labor groups, trucking, airports, local government groups, and trial lawyers.

As set forth in the Agenda, the Work Group heard the following presentations:

2026 Legislative Session Summary *(Joshua Heslinga, VDOT Director of Governance and Legislative Affairs)*
Work Group Organizational Update *(Joshua Heslinga, VDOT Director of Governance and Legislative Affairs)*
Summary of Areas of Interest from Legislative Review *(Tammy Trimble, Ph.D., Virginia Tech Transportation Institute)*
Autonomous Driving Systems Safety Scan *(Noah Goodall, Ph.D., P.E., Virginia Transportation Research Council)*

The latter two presentations drew questions from workgroup members and some comments from stakeholders.

In addition, both workgroup members and stakeholders participated in discussion of the work group's goals and tasks ahead, as it works to complete its meetings and report in the timeframe set forth in the legislation.

Legislative members noted a desire to have comprehensive legislation in 2027, to consider what should be in legislation vs. subsequent regulations and what approach should be taken to legislation (*e.g.*, piloting vs. full deployment), to learn from other states while not necessarily just copying from elsewhere, to act expeditiously while not carelessly or without deliberation, and to proceed in a way that promotes public trust through measurable standards, transparency (including in testing), and accountability.

Labor representatives expressed a desire for concrete recommendations and comprehensive planning for labor and workforce and for Virginia to proceed in a way that's safe for workers and all road users.

Also mentioned in discussion:

- Distinctions between lighter and heavier vehicles (*e.g.*, tractor trailers vs cars).
- The fact that transportation is inter-state, and the potential impediment of a patchwork of requirements and laws.

- Use at airports should take into account the particular and critical needs of airports, and there should be operational data that addresses special circumstances at airports.
- A need for testing and inspection of vehicles in a robust and transparent way.
- Thinking of legislation as being iterative, especially in developing technology.

No votes were taken.

Deputy Secretary Schewel concluded the meeting at approximately 2:15 pm.

The meeting was streamed live (for viewing only, not remote participation) on YouTube.com/@VDOTLIVE, and a recording may be viewed there for complete information regarding the discussion and other content of the meeting.

The presentations and meeting handouts were posted on April 23 on the Commonwealth Calendar page for this meeting and continue to be available to view or download from the "Agenda" link there.

Anyone interested in providing written comments continues to be able to do so at https://publicinput.com/autonomousdriving

* DRAFT *

The following is the remote or electronic participation policy of the Autonomous Driving Workgroup.

Member Remote Participation

Individual Workgroup members may participate in meetings of the Workgroup by electronic communication means to the full extent permitted by applicable law, including § 2.2-3708.3 of the *Code of Virginia*. (When such individual participation is due to a personal matter, such participation is limited by law to two meetings per calendar year or 25 percent of the meetings held per calendar year rounded up to the next whole number, whichever is greater.)

This shall apply to the entire membership and without regard to the identity of the member requesting remote participation or the matters that will be considered or voted on at the meeting.

Whenever a member wishes to participate from a remote location, the law requires a quorum of the Workgroup to be physically assembled at the primary or central meeting location. A member with a disability shall count toward the quorum as physically present, in accordance with law.

Virtual Meetings

The Workgroup may hold all-virtual public meetings to the full extent permitted by applicable law, including Virginia Code § 2.2-3708.3(C). Such all-virtual public meetings are limited by law to two meetings per calendar year or 50 percent of the meetings held per calendar year rounded up to the next whole number, whichever is greater, and may not be held consecutively with another all-virtual public meeting.

When audio-visual technology is available, a member of a public body shall, for purposes of a quorum, be considered absent from any portion of the meeting during which visual communication with the member is voluntarily disconnected or otherwise fails or during which audio communication involuntarily fails.

Requests and Minutes

Requests for remote participation or that the Workgroup conduct an all-virtual public meeting shall be conveyed to Workgroup staff, who shall then relay such requests to the Secretary of Transportation's Office.

To send requests to staff, please submit them via email to Joshua.Heslinga@vdot.virginia.gov and ttrimble@vtti.vt.edu. If a request is made in another manner, staff shall ensure a record exists of the request and its handling.

Individual participation from a remote location shall be considered approved unless a member asserts that such participation would violate this policy or the provisions of the Virginia Freedom of Information Act (Va. Code § 2.2-3700 *et seq.*). If a member's participation from a remote location is challenged, then the Workgroup shall vote whether to allow such participation.

The request for remote participation or that the Workgroup conduct an all-virtual public meeting shall be recorded in the minutes of the meeting. If the Workgroup votes to disapprove of the member's participation because such participation would violate this policy, such disapproval shall be recorded in the minutes with specificity. The minutes shall include other information as required by law (see Va. Code §§ 2.2-3707 and 2.2-3708.3), depending on the type of remote participation or all-virtual public meeting.

_____

This policy was originally adopted at the Workgroup meeting on _____, 2026, and shall be reviewed and adopted once annually by recorded vote at a public meeting.

_____

The following additional explanation is intended to inform understanding of current legal requirements and is not legal advice, an authoritative interpretation of the law, or required by this policy independent of the requirements of law.

Additional Explanation of Current Requirements for Remote Participation by Members

When a meeting is scheduled to be held in person, there are four circumstances set out in subsection B of § 2.2-3708.3 where individual members of a public body may participate from a remote location instead of participating in person. In order to use these provisions, the member must notify the chair of the public body of one of the following four reasons for remote participation:

1. The member has a temporary or permanent disability or other medical condition that prevents the member's physical attendance;
2. A medical condition of a member of the member's family requires the member to provide care that prevents the member's physical attendance, or the member of the body is a caregiver who must provide care for a person with a disability at the time of the meeting, thereby preventing the member’s physical attendance;
3. The member's principal residence is more than 60 miles from the meeting location identified in the required notice for such meeting; or

4. The member is unable to attend the meeting due to a personal matter and identifies with specificity the nature of the personal matter. However, the member may not use remote participation due to personal matters more than two meetings per calendar year or 25 percent of the meetings held per calendar year rounded up to the next whole number, whichever is greater.

The limitations to two meetings per calendar year or 25 percent of the meetings held per calendar year does not apply to the first three types of remote participation (member's disability or medical condition, need to provide medical care for a family member or principal residence distance from the meeting location), it only applies when the member participates due to personal matter.

Additional Explanation of Current Requirements for Minutes

- If an individual member remotely participates in a meeting, a general description of the remote location must be included in the minutes. (That does not need to be an exact address— for example, the minutes might read that "[Member] participated from his home in [locality]" or that "[Member] participated from her office in [locality].") The remote location does not have to be open to the public.
- If a member remotely participates due to a (i) temporary or permanent disability or other medical condition that prevented the member's physical attendance, or (ii) family member's medical condition that required the member to provide care for such family member, thereby preventing the member's physical attendance, that fact must be included in the minutes. While the fact that a disability or medical condition prevents the member's physical attendance must be recorded in the minutes, identifying the specific disability or medical condition is not required.
- If a member remotely participates because the member's principal residence is more than 60 miles from the meeting location, the minutes must include that fact.
- If a member remotely participates due to a personal matter, the minutes must include the nature of the personal matter cited by the member.
- As stated above, if remote participation by a member is disapproved because it would violate the participation policy adopted by the public body, such disapproval must be recorded in the minutes with specificity. Note that even if remote participation is disapproved, the member may continue to monitor the meeting from the remote location but may not participate and may not be counted as present at the meeting.

Additional Explanation of Current Requirements for All-Virtual Meetings

The provisions of Virginia Code § 2.2-3708.3(C) and the following concern all-virtual meetings:

1. An indication of whether the meeting will be an in-person or all-virtual public meeting is included in the required meeting notice, along with a statement notifying the public that the method by which a public body chooses to meet shall not be changed unless the

public body provides a new meeting notice in accordance with the provisions of § 2.2-3707;

2. Public access to the all-virtual public meeting is provided via electronic communication means;
3. The electronic communication means used allows the public to hear all members of the public body participating in the all-virtual public meeting and, when audio-visual technology is available, to see the members of the public body as well;
4. A phone number or other live contact information is provided to alert the public body if the audio or video transmission of the meeting provided by the public body fails, the public body monitors such designated means of communication during the meeting, and the public body takes a recess until public access is restored if the transmission fails for the public;
5. A copy of the proposed agenda and all agenda packets and, unless exempt, all materials furnished to members of a public body for a meeting is made available to the public in electronic format at the same time that such materials are provided to members of the public body;
6. The public is afforded the opportunity to comment through electronic means, including by way of written comments, at those public meetings when public comment is customarily received;
7. No more than two members of the public body are together in any one remote location unless that remote location is open to the public to physically access it;
8. If a closed session is held during an all-virtual public meeting, transmission of the meeting to the public resumes before the public body votes to certify the closed meeting as required by subsection D of § 2.2-3712;
9. The public body does not convene an all-virtual public meeting (i) more than two times per calendar year or 25 percent of the meetings held per calendar year rounded up to the next whole number, whichever is greater, or (ii) consecutively with another all-virtual public meeting; and
10. Minutes of all-virtual public meetings held by electronic communication means are taken as required by § 2.2-3707 and include the fact that the meeting was held by electronic communication means and the type of electronic communication means by which the meeting was held. If a member's participation from a remote location pursuant to these requirements is disapproved because such participation would violate the policy adopted pursuant to subsection D of § 2.2-3708.3, such disapproval shall be recorded in the minutes with specificity.

If an individual member had already reached his limit on participation due to personal matters, but the public body scheduled an all-virtual public meeting, the member could still participate in all virtual public meeting because the numerical limits are counted separately for the different types of electronic meetings.

Knowledge ADVISORY GROUP

Assessment of Labor Impacts Created by Autonomous Vehicles:

Project Overview for the Autonomous Driving Work Group

5/22/26

About Knowledge Advisory Group

- Management consultants for government agencies and nonprofit organizations
- 30+ years experience in quantitative and qualitative data strategy, collection, and analysis
- Virginia SWaM certified and staffed by former Virginia state employees

Our Scope of Work

- Conduct review of background information
- Establish data collection methodology
- Conduct interviews with key parties
- Facilitate discussion session at Summer Roundtable
- Provide a summary of findings to the AV Work Group

Trina Willard

Trina@KnowledgeAdvisoryGroup.com

(804)-564-6969

VIRGINIA TECH TRANSPORTATION INSTITUTE

State Domain Issue Discussion

Tammy Trimble, Ph.D., Research Scientist

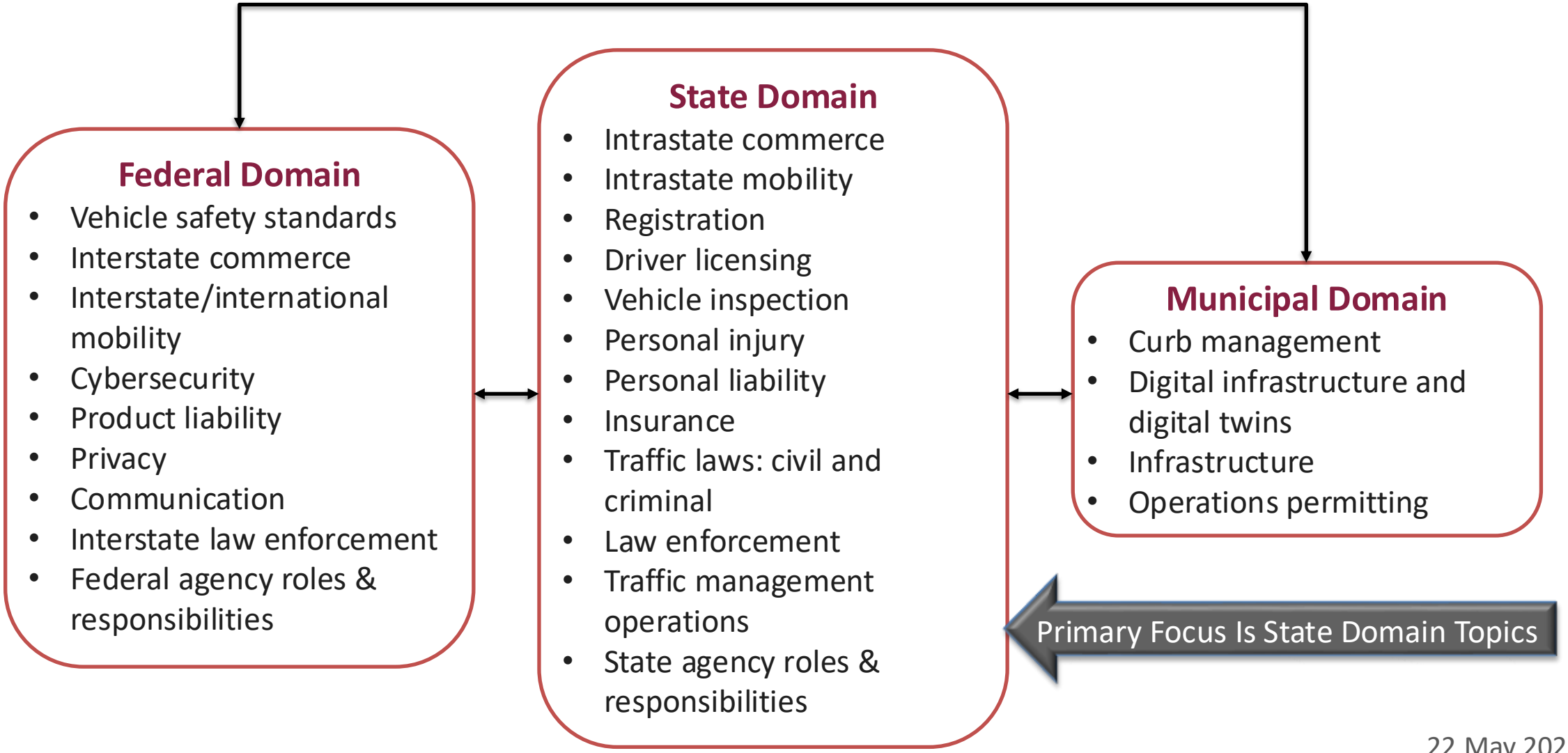
22 May 2026

Overview

What we'll cover today

- Who may operate AVs in the Commonwealth
- Permitting criteria
- Licensing requirements for fallback-ready test operators
- Safety self-certification clauses
- Taxes and other fees
- Other topics of interest to the Working Group members

Review – Interplay Between Federal, State, and Local Domains for AVs



Who May Operate AVs in the Commonwealth?

Permitting trends across the U.S.

Permitting Status	States
Driverless deployment	Alabama, Arizona, Arkansas, California, Colorado, Florida, Georgia, Iowa, Kansas, Kentucky, Louisiana, Michigan, Mississippi, Montana, Nebraska, Nevada, New Hampshire, New Mexico, North Carolina, North Dakota, Oklahoma, Pennsylvania, South Dakota, Tennessee, Texas, Utah, West Virginia
Driverless testing	District of Columbia, Maine, Maryland, Ohio, Washington
Testing with a fallback-ready test operator permitted	Connecticut, Hawaii, Massachusetts, New York, Rhode Island, Vermont
Governors have issued AV-related executive orders or proclamations	Arizona, Delaware, Hawaii, Idaho, Illinois, Maine, Massachusetts, Minnesota, Ohio, Virginia, Washington, Wisconsin

Who May Operate AVs in the Commonwealth?

Use case trends across the U.S.

Use Cases in Neighboring States

District of Columbia

- Testing with test operator
- Most likely use cases will be shuttles, robotaxis, and local goods delivery (Buckley, 2026)

Maryland

- Driverless testing; in practice driver may be required
- "Each case will be handled according to its unique circumstances"

Example Use Cases Across the U.S.

Commercial On-demand AV TNC Operations

- Arizona, California, Colorado, Florida, Georgia, Louisiana, Nevada, North Carolina, North Dakota, Pennsylvania, Tennessee, Texas, Utah, West Virginia

Agriculture/Construction/Mining/Rural Applications

- Colorado, Iowa, Minnesota, Missouri, Nevada, New Mexico, North Dakota

Recycling and Trash Trucks

- Massachusetts

Who May Operate AVs in the Commonwealth?

Use case trends across the U.S. – Commercial Trucking Deployments

Example Use Case	Locations
Heavy duty commercial trucking	Arizona, Arkansas, Florida, Georgia, Louisiana, Michigan, Nebraska, New Mexico, Oklahoma, Texas, Utah
Medium duty commercial trucking	Arizona, Iowa, Kansas, Louisiana, Tennessee
Permitted but focus is on research and testing	Iowa, Montana, Mississippi, Pennsylvania
On-road commercial trucking applications permitted but not active	Alabama, Kentucky (driver required for vehicles +62,000 lbs. through 7/31/2026), California (permitted April 2026), Colorado, Minnesota, Missouri, Nevada, North Carolina, North Dakota, South Carolina, South Dakota, West Virginia, Wyoming

Considerations for AV Operations in the Commonwealth

- Clarify who can and cannot own and operate AVs
- Consider factors such as multi-jurisdictional operations, current Commonwealth AV development activities, Commonwealth freight corridors, etc., to determine which classes of vehicles may be granted authorization by the DMV to operate one or more AVs
- Consider limiting operation of Level 4+ AVs to corporate entities as well as universities
- For those classes of vehicles not specifically addressed in the legislation, consider permitting universities to continue collaborating with corporate entities on AV-related efforts
- Note any ODD use case restrictions or special considerations (e.g., use in/around airports, ports)

What Should the Permitting Criteria Look Like?

Provide a process for MOEs wishing to test or deploy AVs to apply for a permit before operating on Virginia's public roadways. This process should provide sufficient information to allow for interaction with the manufacturer and its vehicle(s). The process should also ensure the safety of other roadway users.

Sources for Consideration

- American Association of Motor Vehicle Administrators
  - *Guidelines for Regulating Vehicles with Automated Driving Systems, Edition 4*
- Trends in other states, including:
  - West Virginia
  - California
  - Maryland *(Permit Process for Testing Highly Automated Vehicles (HAVs) in Maryland)*
- Industry recommendations and best practices for permit-related supporting materials
  - Automated Vehicle Safety Consortium (AVSC) - SAE ITC

Considerations for Minimum Permitting Requirements

- ❑ Gather sufficient information to allow for interaction with the MOE and its vehicles
- ❑ MOE certification that:
  - ✓ The AV Is capable of achieving a minimal risk condition in the event of a system failure
  - ✓ The AV is capable of operating in compliance with applicable traffic and safety laws
  - ✓ The AV is certified to be in compliance with applicable FMVSS or has exemption
  - ✓ Any additional data will be provided (incident or disengagement reporting)
  - ✓ Has submitted a FRIP to and coordinated with the Virginia State Police and other first responders in testing/deployment jurisdictions to provide training
  - ✓ Appropriate permit, registration, or other materials and fees have been completed and submitted (see discussion of taxes and fees)
- ❑ Consider whether a mechanism to capture and store sensor data for 30 seconds prior to a collision is required (see discussion of crash, incident, and disengagement reporting)
- ❑ Include language that the DMV may immediately suspend permits if the operation poses a safety risk

What Are the Licensing Requirements for Fallback-ready Test Operators?

Ensure that fallback-ready test operators involved with testing operations are licensed to operate the class of vehicle in question and have received training from the MOE on the specific AV to be operated

Why Is Licensing Important?

- Virginia requires drivers to be properly licensed for the class of vehicle to be operated
- Level 4 and Level 5 ADS-equipped vehicles designed to accommodate operation by a driver may require operation by a fallback-ready test operator when the ADS is installed on a vehicle but not engaged
- Need to ensure that the operator has a license with the endorsement or classification that corresponds to the class of vehicle to be operated

Considerations for Licensing

- Require fallback operators to hold a driver's license corresponding to those of an operator of a non-AV for the vehicle class to be operated
- Require the MOE to certify that all employees, contractors, or other persons designated to operate Level 4 or Level 5 vehicles received appropriate training (see section on training recommendations)
- Determine if DMV should be notified of additional operators that may be added during the deployment

What Should AV Safety Certification Look Like?

Certify that vehicles meet safety requirements and are able to safely operate and drive on Virginia's roads

Background

- Self-certification allows entities to formally declare that certain conditions or standards have been met without requiring certification or verification by a third party, and that the certifying party assumes responsibility for the accuracy of their statement
- Self-certification with FMVSS is the current standard with conventional vehicles
- Self-certification allows for the practical realities of rapidly evolving technologies, including automation
- The AVSC provides best practices related to the development and assessment of AV safety cases, including:
  - *Metrics and Methods for Assessing Safety Performance of Automated Driving Systems (ADS)*
  - *Assessment of Automated Driving System-Dedicated Vehicles (ADS-DVs) Safety Case Claims Supported by Evidence (CSE)*

What Should AV Safety Certification Look Like?

The District of Columbia and Maryland both require self-certification as part of the permitting processes

Example: Maryland Self-Certification Required As Part of the Permit Process

- ✓ AV safety training has been provided to employees, contractors, or other people designated to operate the vehicle
- ✓ AV meets all the applicable FMVSS or equivalent or has an exemption
- ✓ A reasonable measure of previous testing of technology in the test vehicles has been performed under controlled situations that simulate the real-world ODD conditions (various weather, types of roads, times of day) the AV is intended to operate on, prior to testing on roadways open to the public
- ✓ The points within the Safety Assessment Letter submitted to NHTSA have been addressed and include but are not limited to object detection, minimum risk condition, validation methods, data recording, post-crash behavior, privacy, system safety, vehicle cybersecurity, crashworthiness, ethical considerations, and compliance with federal, state and local laws

Considerations for AV Self-Certification

- Determine what information is required as part of the self-certification; for example, certain number of miles driven, demonstrations within specific ODDs, additional data submitted as part of the incident and disengagement data reporting and retention requirements
- Require the MOE to certify that the vehicles comply with all applicable FMVSS, including reference to an applicable exemption granted by NHTSA, if any
- Require certification that the vehicles are capable of being operated in compliance with the applicable traffic and motor vehicle laws of the Commonwealth, regardless of whether or not the vehicle is under automated operation
- Require the MOE to certify that all employees, contractors, or other persons designated to operate Level 4 or Level 5 vehicles received appropriate training (see sections on permit and fallback-ready test operator training considerations)

Sales Tax, Business Personal Property Tax, and Other Fees

Determine what sales taxes, business personal property taxes, and other fees may apply to AV permit applicants, AV rides provided, or vehicles that are hosted and maintained at a Commonwealth-based AV depot

Background

- Increased use of AVs may reduce fuel tax revenue and sales taxes and registration fees
- Options exist to compensate for the reduction in revenue, including vehicle-mile tax, congestion charges, or taxes on TNCs
- Across the U.S., specific permit and application fees vary and may be split between administrative and registration costs and specific permit fees

Examples of Permit/Application Fees

- **California:** $3,600 nonrefundable application fee and biennial renewal fee of $3,600 (covering up to 10 vehicles and 20 operators). $50 fee for each additional set of 1–10 vehicles and 1–20 drivers. $70 processing fee for changes or modifications to the testing permit. Permit fee of $3,275 for post-testing deployment.
- **Nevada:** $100 testing fee (new and renewal) and $20.50 per vehicle for testing license plates.
- **New Hampshire:** Annual fee of $500.
- **New York City:** Requires a NYC DOT testing permit and an annual fee of $5,000.

Considerations for Taxes and Other Fees

- Consider imposing a per-ride sales tax for each on-demand AV TNC ride; non-AV TNC rides could be exempt
- Consider imposing generally applicable business personal property tax applied by a local jurisdiction on tangible personal property
  - Tax would only apply to those AVs that are hosted and maintained at an AV depot within the Commonwealth, not AVs transiting to or through a jurisdiction
- Consider if other AV permit/application/registration fees may be appropriate

Discussion & Next Steps

What other questions do we need to address today?

- Are there other topics or considerations to be considered as we move forward?
- Reminder: There will be separate workforce and safety reports
- Any other concerns or recommendations?
- Send additional feedback to Tammy Trimble at ttrimble@vtti.vt.edu

Appendix

VTTI Handout

Operational, Technical, and Legal Issues Presented by the Operation of Automated Driving Systems in the Commonwealth – Draft State Domain Issues Review

Operational, Technical, and Legal Issues Presented by the Operation of Automated Driving Systems in the Commonwealth

Draft State Domain Issues Review

Date: May 2026

Submitted by:
Virginia Tech Transportation Institute
3500 Transportation Research Plaza
Blacksburg, VA 24061

VIRGINIA TECH TRANSPORTATION INSTITUTE

CONTENTS

ACRONYMS

AAMVA	American Association of Motor Vehicle Administrators
ADAS	advanced driver assistance systems
ADS	Automated Driving System
ADS-DV	Automated Driving System-Dedicated Vehicle
AV	automated vehicle
AVIA	Autonomous Vehicle Industry Association
AVSC	Automated Vehicle Safety Consortium
CDL	Commercial Driver's License
CMV	commercial motor vehicle
CMVSS	Canada Motor Vehicle Safety Standards
CVSA	Commercial Vehicle Safety Alliance
DDT	dynamic driving task
DMV	Department of Motor Vehicles
DOT	Department of Transportation
FMVSS	Federal Motor Vehicle Safety Standards
FRIP	first responder interaction plan
IRP	International Registration Plan
LEIP	law enforcement interaction plan
MOE	manufacturers or other entity
NHTSA	National Highway Traffic Safety Administration
ODD	operational design domain
OEDR	object and event detection and response
SAE J3016	"Taxonomy and Definitions for Terms Related to Driving Automation Systems for On-Road Motor Vehicles," published by SAE International on April 29, 2021, as revised, or its successor standards.
SGO	Standing General Order Incident Reporting for Automated Driving Systems and Level 2 Advanced Driver Assistance Systems
TNC	transportation network company
U.S. DOT	United States Department of Transportation
VDOT	Virginia Department of Transportation

INTRODUCTION

Currently, there is no overarching national framework for the testing and deployment of vehicles equipped with Automated Driving Systems (ADSs). Nevertheless, efforts at the national level and by organizations of state motor vehicle administrators provide indicators of the priorities in such a framework, identifying policy areas traditionally associated with federal, state, and local domains (Figure 1).

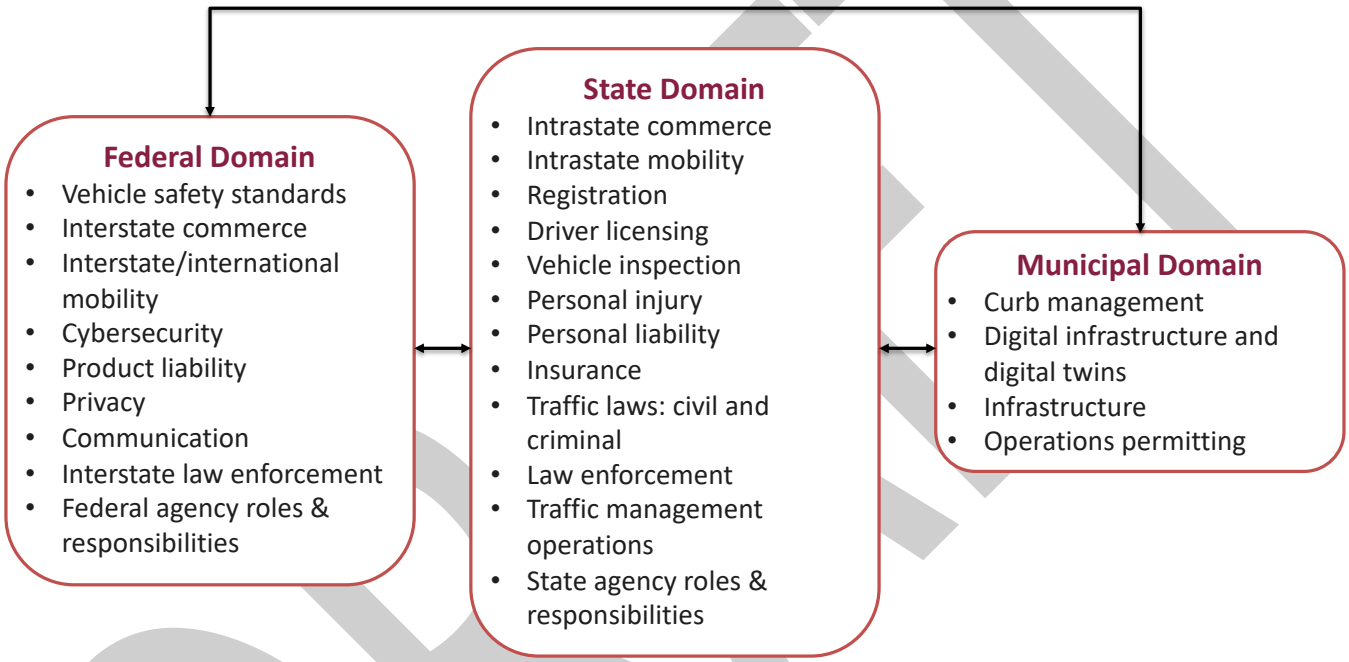


Figure 1. Interplay between federal, state, and local domains for AVs, adapted from Buckley (2026) and Loftus-Otway & Gallun (2024).[1,2]

This document provides an overview of state domain issues that need to be addressed during the development of the Commonwealth of Virginia's policies related to ADSs and "automated vehicles" (AVs). Summaries of these state domain issues were prepared based on a review of recommended practices developed by the United States Department of Transportation (U.S. DOT), the American Association of Motor Vehicle Administrators (AAMVA), state- or district-sponsored reports and policies, and industry guidance, including best practices provided by SAE International, the Automated Vehicle Safety Consortium (AVSC)–SAE ITC, and the Autonomous Vehicle Industry Association (AVIA). While issues to be addressed were obtained for all state AV-related efforts, particular attention was given to efforts associated with states neighboring Virginia, where likely inter-jurisdictional travel may occur as part of AV deployments; states where regulations have been recently updated (i.e., California, Texas); and other states noted for their role as AV activity hubs (e.g., New Mexico, Florida).

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[1] Buckley, S. (2026). *Research report: State of U.S. automated vehicle policy* (Research Report 26-01). Kimley-Horn and Associates. https://ddot.dc.gov/sites/default/files/dc/sites/ddot/DDOT%20Research%20Report%20State%20of%20U.S.%20Automated%20Vehicle%20Policy_April%202026.pdf

[2] Loftus-Otway, L., Gallun, S. (2024). *Multistate Coordination and Harmonization for AV Legislation*. NCHRP Legal Research Digest 89. https://doi.org/10.17226/27867

Several topics noted, such as intrastate commerce and mobility, are overarching themes that run throughout the discussions.

The remainder of this report will present key gaps in Virginia law related to state domain issues, the objective behind addressing that gap, the rationale, alternative approaches to addressing the gap, the Commonwealth agencies with primary oversight of the issue, and the recommended approach (i.e., legislative, regulatory, or combination). For purposes of this discussion, it is assumed that localities will retain their existing authorities relevant to motor vehicles (e.g., curb management).

Operational Considerations

State Domain Issue: Who May Operate AVs

Objective: Determine which class(es) of vehicles may be operated within the Commonwealth.

Background: States have taken a variety of approaches towards the testing and deployment of AVs (Table 1). Many states have taken an evolutionary approach to permitting. For example, California, an early supporter of state AV operations, initially restricted AVs to those under 10,001 pounds but is currently in the process of updating their regulations to permit vehicles over 10,000 pounds. In terms of reporting, California is looking to include requiring safety cases and shifting from disengagement reports to documentation of dynamic driving task (DDT) system failures. In Louisiana, initial deployment focused on commercial vehicles with a gross vehicle weight rating of 26,000 lbs. However, more recently, the state is considering the operation of on-demand AV transportation network company (TNC) services in New Orleans.

Table 1. Summary of State AV Permitting Status

Permitting Status	States
Driverless Deployment	Alabama, Arizona, Arkansas, California, Colorado, Florida, Georgia, Iowa, Kansas, Kentucky, Louisiana, Michigan, Mississippi, Montana, Nebraska, Nevada, New Hampshire, New Mexico, North Carolina, North Dakota, Oklahoma, Pennsylvania, South Dakota, Tennessee, Texas, Utah, West Virginia
Driverless Testing	District of Columbia, Maine, Maryland, Ohio, Washington
Testing with a Fallback-ready Test Operator Permitted	Connecticut, Hawaii, Massachusetts, New York, Rhode Island, Vermont
Governors Have Issued AV-related Executive Orders or Proclamations	Arizona, Delaware, Hawaii, Idaho, Illinois, Maine, Massachusetts, Minnesota, Ohio, Virginia, Washington, Wisconsin

Similarly, the use cases permitted or anticipated vary. The District of Columbia notes that the most likely use cases for AVs in the District will be shuttles, robotaxis, and local goods delivery.[3] In Maryland, the permit process framework does not specify a use case, noting rather that "each case will be handled according to its unique circumstances."[4] However, a 2021 law specifically provides for the

[3] District Department of Transportation (2026). *Autonomous vehicles.* https://ddot.dc.gov/page/autonomous-vehicles
[4] Maryland Department of Transportation (2022). *Permit process for testing highly automated vehicles (HAVs) in Maryland.* https://cav.mdot.maryland.gov/wp-content/uploads/2022/10/PermitProcessforTestingHAVs.pdf

operation of personal delivery devices.[5] Additionally, while the Maryland process indicates driverless testing may be permitted, in practice a driver may be required. In New Hampshire, a pilot program approved by the Department of Motor Vehicles to test and deploy AVs on public roads. Arkansas requires a licensed driver in the vehicle for the first 6 months of AV program operation. In Kansas, a fallback-ready test operator is generally required for the first 12 months of operation. Kentucky will also require a driver until July 31, 2026, for AVs with a gross vehicle weight rating of over 62,000 lbs. A summary of specific use cases is provided in Table 2.

Table 2. Examples of AV Use Cases by State

Use Case	States
Commercial On-Demand AV TNC operations	Arizona, California, Colorado, Florida, Georgia, Louisiana, Nevada, North Carolina, North Dakota, Pennsylvania, Tennessee, Texas, Utah, West Virginia
Level 4 Heavy-Duty Trucking	Alabama, Arkansas, Arizona, California, Colorado, Florida, Kentucky, Louisiana, Minnesota, Nebraska, Nevada, Ohio, Texas
Personal Delivery Devices	Arizona, California, Colorado, Florida, Idaho, Maryland, Missouri, North Carolina, Ohio, Pennsylvania, Tennessee, Texas, Utah, Virginia, Washington, Wisconsin

Key Considerations:

- Clarify who can and cannot own and operate AVs.
- Consider factors such as multi-jurisdictional operations, current Commonwealth AV development activities, Commonwealth freight corridors, labor needs, etc., to determine which classes of vehicles may be granted authorization by the Department to operate one or more AVs.
- Consider limiting operation of Level 4+ AVs to corporate entities as well as universities.
- For those classes of vehicles not specifically addressed in the legislation, consider permitting universities to continue collaborating with corporate entities on AV-related efforts.
- Note any operational design domain (ODD) use case restrictions or special considerations (e.g., use in/around airports, ports).

State Domain Issue: Inconsistent Use of Terminology and Definitions

Objective: Common definitions are needed to ensure the understanding of concepts associated with ADSs, as well as the intent of associated legislative and regulatory actions. Common definitions will also help to facilitate inter-jurisdictional ADS operations.

Background: The U.S. DOT encourages a consistent regulatory and operational environment for AVs, noting that "clear and consistent definition and use of terminology is critical to advancing the discussion around automation."[6] To that end, Automated Vehicles 3.0 uses "automation" and "automated vehicles" as general terms to broadly describe the topic, and uses more specific language, consistent with SAE

[5] Maryland Senate Bill 726 (2021). *Vehicle Laws – Personal Delivery Devices – Standards and Requirements.* https://mgaleg.maryland.gov/2021RS/chapters_noln/Ch_351_sb0726E.pdf

[6] U.S. DOT (2018). *Automated vehicles 3.0 preparing for the future of transportation*. https://www.nhtsa.gov/vehicle-manufacturers/automated-driving-systems

J3016 when appropriate. The District of Columbia,[7] Maryland,[8] California,[9] and Texas[10] all use definitions that reference SAE J3016. Using SAE J3016 terminology is also consistent with the AVIA[11] recommendations for legislation.

Key Considerations

- Modify §46.2-100 to adopt definitions of terms to be used throughout the subsequent recommendations and within legal and regulatory guidelines. These definitions should be consistent with SAE Recommended Practice J3016 Taxonomy and Definitions for Terms Related to Driving Automation Systems for On-Road Motor Vehicles.
- Considerations should be made as to how those definitions compare to those adopted by neighboring states that are likely candidates for near-term inter-jurisdictional testing and/or deployments (e.g., the District of Columbia, Maryland) and those with recently updated regulatory frameworks (i.e., California, Texas).
- Appendix A provides a list of proposed definitions.

States with similar approach: Alabama, Arizona, Arkansas, California, Colorado, Connecticut, District of Columbia, Hawaii, Iowa, Kentucky, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, South Dakota, Texas, Utah, Vermont, Washington, West Virginia

Agency oversight: Virginia Department of Transportation (VDOT), Virginia Department of Motor Vehicles (DMV)

Legislative or Regulatory: Legislative

State Domain Issue: Clarification of Vehicle Operators

Objective: To further clarify definitions associated with the operation of SAE Level 4 and Level 5 vehicles and responsibilities associated with the operation of a vehicle, clear articulation of the vehicle operator is required.

Background: As noted in SAE J3016, the DDT includes "all of the real-time operational and tactical functions required to operate a vehicle in on-road traffic, excluding the strategic functions such as trip scheduling and selection of destinations and waypoints, and including, without limitation, the following subtasks:

1. Lateral vehicle motion control via steering (operational);

[7] Code of the District of Columbia §50-2351. *Definitions.* https://code.dccouncil.gov/us/dc/council/code/sections/50-2351
[8] Maryland Department of Transportation (2022). *Permit process for testing highly automated vehicles (HAVs) in Maryland.* https://cav.mdot.maryland.gov/wp-content/uploads/2022/10/PermitProcessforTestingHAVs.pdf
[9] Texas Transportation Code §545.451. *Definitions.* https://statutes.capitol.texas.gov/?tab=1&code=TN&chapter=TN.545&artSec=545.451
[10] California Department of Motor Vehicles §227.02. *Definitions.* https://www.dmv.ca.gov/portal/file/adopted-regulatory-text-pdf/
[11] AVIA (2025). *Securing American leadership in autonomous vehicles: Advancing the framework for automated driving system safety*. https://cdn.prod.website-files.com/67ee365c25e6530594bd40c2/683d8d2fa60ac22d542b1049_Securing%20American%20Leadership%20in%20Autonomous%20Vehicles1.pdf

2. Longitudinal vehicle motion control via acceleration and deceleration (operational);
3. Monitoring the driving environment via object and event detection, recognition, classification; and response preparation (operational and tactical);
4. Maneuver planning (tactical); and
5. Enhancing conspicuity via lighting, sounding the horn, signaling, gesturing, etc. (tactical)."

The role of fully performing all the subtasks of the DDT may be fulfilled by the human driver, the driving automation system, or a combination of both. As defined within the Code of the District of Columbia §50-2351, "autonomous operation means the performance of the entire DDT by an ADS, beginning upon the performance of the entire DDT by an ADS and continuing until the ADS is disengaged."[12]

When assessing compliance with applicable traffic or motor vehicle laws, it should be clear whether the responsibility for compliance is with a human driver or an engaged ADS installed on SAE Level 4 of Level 5 vehicle.

Key Considerations

- Recognize that the ADS is the operator of the vehicle. When an ADS installed on a motor vehicle is engaged, the ADS is the operator of the vehicle, including for purposes of assessing compliance with applicable traffic or motor vehicle laws.
- Recognize the responsibilities of the owner or authorized operator. When an ADS installed on an SAE Level 4 or Level 5 vehicle is engaged, the owner of the automated motor vehicle or, if the vehicle is operating under an authorization issued by the department, the authorization holder for the automated motor vehicle shall be issued any citation for a violation of traffic or motor vehicle laws related to the vehicle.
- Allow for the driverless testing or operation of an SAE Level 4 or Level 5 vehicle. Notwithstanding any other law, a licensed human driver is not required to operate an SAE Level 4 or Level 5 automated motor vehicle if the ADS installed on the vehicle is engaged.

Other states with similar requirements: California, Colorado, District of Columbia, Florida, Georgia, Iowa, Kansas, Kentucky, Louisiana, Michigan, Mississippi, Nebraska, New Mexico, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, South Dakota, Tennessee, Texas, Utah, Washington, West Virginia

Agency oversight: Virginia DMV and Virginia State Police

Legislative or Regulatory: Legislative

PERMITTING CONSIDERATIONS

State Domain Issue: Permitting Criteria

Objective: Provide a process for manufacturers or other entities (MOEs) wishing to test or deploy AVs to apply for a permit before operating on Virginia's public roadways. This process should provide sufficient information to allow for interaction with the manufacturer and its vehicle(s). The process should also ensure the safety of other roadway users.

[12] Code of the District of Columbia §50-2351. *Definitions*. https://code.dccouncil.gov/us/dc/council/code/sections/50-2351

Background: AAMVA suggests that the permit application process include the completion or attachment of all the following information:[13]

- Name of the MOE
- Corporate physical and mailing address of manufacturer or other entity
- In-jurisdiction physical and mailing address of MOE if different than the corporate address
- Program administrator or director and associated contact information
- Vehicle-specific information for all vehicles to be permitted, including:
    - Vehicle identification number (VIN)
    - Year (if assigned by the manufacturer)
    - Make (if assigned by the manufacturer)
    - Model (if assigned by the manufacturer)
    - License plate number and jurisdiction of issuance (if applicable)
    - SAE level of testing and description of actual ADS features to be tested (more specific than just level of testing)
    - Indication of intention for testing with or without a human controlling the vehicle from within the vehicle type (passenger, commercial, low speed, etc.)
- List of all drivers of ADS-equipped vehicles, including:
    - Full name
    - Date of birth
    - Driver's license number and jurisdiction or country of issuance
- Summary of training provided to employees, contractors, or other persons designated by the manufacturer or other entity as drivers of test vehicles
- Disclosure of all jurisdictions where application or issuance of testing registration permits has occurred or been denied
- Confirmation that no active safety system (e.g., automatic emergency braking) has been modified (where applicable). If the active safety system has been modified, the capability must still remain.
- Disclosure of all jurisdictions where testing is or has occurred and an application or permit was not required. Require details of what testing occurred and a description of any incidents.
- Self-certification of prior testing of the technology to be used in the test vehicles under controlled conditions that simulate the real-world conditions (including, but not limited to, weather, types of roads, and times of the day and night) the manufacturer intends to subject the vehicle to on public roadways
- Certification from the MOEs testing ADS-equipped vehicles within the jurisdiction that the vehicles comply with all applicable Federal Motor Vehicle Safety Standards (FMVSS) or Canada Motor Vehicle Safety Standards (CMVSS) and no required safety devices have been made inoperable; in lieu of the certification, evidence the vehicle(s) received an exemption or waiver from the FMVSS or CMVSS (see Section 4.9)
- Certification that any vehicle used within this program is not subject to open recalls
- Copy of the manufacturer's safety plan for testing vehicles, including a minimal risk condition component
- Routes to be used when testing ADS-equipped vehicles without a human controlling the vehicle from within the vehicle (if applicable)
- Description and details of remotely controlled operation of vehicles in the course of testing, including items such as redundancy, latency, location of remote operator(s), and licensure of remote operators

[13] AAMVA (2024, March). *Guidelines for regulating vehicles with Automated Driving Systems. Edition 4* Section 4.1 *Application and permit for manufacturers and other entities to test vehicles on public roadways.* https://www.aamva.org/getmedia/c95fd480-5917-471a-b7ee-da88ec6cb7b5/Guidelines-for-Regulating-Vehicles-with-Automated-Driving-Systems-Ed-4_final.pdf

- Evidence of the MOE's ability to respond to damages for personal injury, death, or property damage caused by a vehicle during testing; evidence may be in the form as approved by the jurisdiction (e.g., an instrument of insurance, a surety bond, proof of self-insurance)
- Plan for sharing relevant incidents and crash data regarding the vehicle, driver, and vulnerable road users leveraging provisions of NHTSA's current Standing General Order Incident Reporting for Automated Driving Systems and Level 2 Advanced Driver Assistance Systems (SGO) Acknowledgement from the MOEs that they will disclose any conflict[14] related to the movement of test vehicles in the local jurisdiction. Similarly, the MOEs should disclose any pattern of conflict that is either observed or is being actively investigated in other jurisdictions. AVIA notes that AV deployment laws generally permit AVs to operate without a human driver if an AV is:
    - Able to achieve a minimal risk condition in the event of a system failure;
    - Capable of operation in compliance with applicable traffic and safety laws; and
    - Certified to be in compliance with applicable FMVSS, including reference to any exemption.
- A first responder interaction plan has been provided to the state.
- The AV meets applicable insurance, registration, and titling requirements.

These recommendations are consistent with current state activities. For example, West Virginia permits the operation of fully autonomous vehicles without a human driver, provided the ADS is engaged and the vehicle meets the following conditions:[15]

1. If a failure of the ADS occurs which renders the system unable to perform the entire dynamic driving task (DDT) relevant to its intended operational design domain, the fully autonomous vehicle will achieve a minimal risk condition;
2. The fully autonomous vehicle is capable of operating in compliance with the applicable traffic and motor vehicle safety laws and regulations of this state when reasonable to do so, unless an exemption has been granted by the Department of Transportation; and
3. When required by federal law, the vehicle bears the required manufacturer's certification label indicating that at the time of its manufacture it has been certified to be in compliance with all applicable Federal Motor Vehicle Safety Standards, including reference to any exemption granted by the National Highway Traffic Safety Administration.
4. A law enforcement interaction plan has been submitted.

California includes an additional requirement. Under California Vehicle Code § 38750 (2025), AVs operating on public roads must be equipped with a separate mechanism to capture and store sensor data for at least 30 seconds prior to a collision. This mechanism operates in a "read-only" format to ensure data integrity for at least 3 years, acting as critical evidence for incident review and legal liability.[16]

Key Considerations

- Consider permitting criteria in tandem with the State Domain Issue: Safety Self-certification Clauses discussion.
- Gather sufficient information to allow for interaction with the manufacturer and its vehicle(s) (see AAMVA recommendations above).
- Receive MOE self-certification that the AV:

[14] Adapted from ISO/TR 21974-1 and SAE J3206. Objects should be construed broadly to include any object or animal that could reasonably contribute to property damage or injury of a road user if struck at normal travel speeds. Yukevich, S. (2023, November 7). Information Request ID PE23018-02 [Letter to Ms. Alicia Fenrick, Associate General Counsel, Cruise LLC]. NHTSA. https://static.nhtsa.gov/odi/inv/2023/INIM-PE23018-12560.pdf

[15] West Virginia Code (2022). *Chapter 17H. Fully Autonomous Vehicle Act.* https://code.wvlegislature.gov/17H-1-5/

[16] CA Veh Code § 38750 (2025). https://law.justia.com/codes/california/code-veh/division-16-6/section-38750/

    - Is able to achieve a minimal risk condition in the event of a system failure;
    - Operates in compliance with applicable traffic and safety laws;
    - Is certified to be in compliance with applicable FMVSS, including reference to any exemption; and
    - Provides any additional required data (see also State Domain Issue: Crash, Incident, and Disengagement Data Reporting)
- Require a first responder interaction plan (FRIP; see separate section on FRIP components).
- Determine if permit fees are applicable and how much those fees should be (see other fees discussion below).
- Consider whether AVs operating on public roads should be equipped with a separate mechanism to capture and store sensor data for at least 30 seconds prior to a collision.
- Include language that the DMV may immediately suspend permits if the operation poses a safety risk to the public.

States with permit requirements: States with AV testing and/or deployment have varying permitting requirements or are in the process of developing requirements. The key components are included in the alternatives section above.

Agency oversight: Virginia DMV

Legislative or Regulatory: Major requirements may be legislative with any other information deemed necessary to be determined by the Commissioner.

State Domain Issue: Titling and Registration of Motor Vehicles

Objective: Ensure that the registration requirements for AVs are consistent with those for non-AVs and do not result in undue administrative burden for AV manufacturers/developers.

Background: Per the Code of Virginia §46.2-600, every vehicle owner or authorized representative must register their motor vehicle, trailer, or semitrailer with the overseeing department before driving it on any highway within the state. Looking at commercial motor vehicles (CMVs) specifically, if a CMV is registered in another state, it does not need to register in Virginia if it is properly registered under the International Registration Plan (IRP) or has valid reciprocity, operating in interstate commerce. However, if the CMV is based, titled, or primarily operates intrastate (within Virginia) for business, it should register with the Virginia DMV and pay appropriate taxes and fees.[17] Exemptions exist for the titling and registration of company vehicles of automotive manufacturers.[18]

Key Considerations

- Require titling and registration consistent with current state requirements for non-AV vehicles.
- Consider whether AVs that are registered in the state to be identified on the registration as an AV.
- Determine if an additional fee should be assessed for AVs registered within the Commonwealth as part of the registration process and/or the permitting process.

[17] Code of Virginia § 46.2-660 *Article 5. Reciprocity for Nonresidents.*
[18] Code of Virginia §46.2-602.2 *Titling and registration of company vehicles of automotive manufacturers.*

- For vehicles titled and registered within Virginia, consider requiring the level of automation equipped on the vehicle. For AVs not titled and registered within Virginia but included as part of a MOE permit, gather the information related to the level of automation as part of the permitting process.

States requiring titling and registration in accordance with current laws of the state consistent with those of non-AVs: Alabama, Arizona, Colorado, North Dakota, Oklahoma, South Dakota, Tennessee, Texas, West Virginia

States gathering additional vehicle-related data, including the level of automation, as part of the titling process: Georgia, Iowa, Kansas, Kentucky, North Carolina

Agency oversight: Virginia DMV, in consultation with the IRP and Washington Metropolitan Area Transit Commission

Legislative or Regulatory: Legislative

State Domain Issue: First Responder Interaction Plan (FRIP)

Objective: Ensure that law enforcement and other first responders have the information necessary to safely interact with the AV and contact the MOEs in a timely manner.

Background: FRIPs provide guidance for law enforcement, first responders, and other emergency personnel when interacting with AVs. A FRIP describes how first responders should interact with an AV: at a minimum, (i) how to communicate with a fleet support specialist who is available during the times the AV is in operation; (ii) how to safely remove the AV from the roadway and steps to safely tow the vehicle; (iii) how to recognize whether the AV is in autonomous mode; and (iv) any additional information the manufacturer or fleet operator deems necessary regarding public safety risks associated with the operation of the AV. FRIPs replaces the term law enforcement interaction plans (LEIPs) and expands the focus of LEIPs by including all emergency responders and potential secondary responders such as tow truck operators. In some cases, the terms FRIP and LEIP are used interchangeably.

While interaction specifics will vary based on vehicle type and ADS application, ensuring a consistent framework will assist law enforcement and other first responders when they need to interact with an Automated Driving System-Dedicated Vehicle (ADS-DVs). Both AAMVA and AVIA support the requirement of a first responder interaction plan before operating on the public roads of a given state.[19,20] Further, the AVSC Best Practice for First Responder Interactions with Fleet-Managed ADS-DVs (Revised) recommends a framework for ADS-DV developers when creating a FRIP. Recommended components are included as Section 6.1 of the AVSC Best Practice document and include:[21]

- An introduction describing the process used to develop the plan, how information is organized, stakeholders included in the plan creation, and review/update process and schedule;

[19] AAMVA (2024, March). *Guidelines for regulating vehicles with Automated Driving Systems. Edition 4* https://www.aamva.org/getmedia/c95fd480-5917-471a-b7ee-da88ec6cb7b5/Guidelines-for-Regulating-Vehicles-with-Automated-Driving-Systems-Ed-4_final.pdf

[20] AVIA. *State policy*. https://www.theavindustry.org/policy

[21] Automated Vehicle Safety Consortium (2024). *First responder interactions with fleet-managed automated driving system-dedicated vehicles* (ADS-DVs) (Revised) (AVSC-I-01-2024). https://avsc.sae-itc.com/publication/avsc-01-2024

- A description of the ODD including the geographical area description, including applicable limitations, road types (e.g., divided roads, one-way streets, highways), speed range, weather condition, time of day;
- The role(s) and responsibilities, type(s) of services provided, and hours of fleet operations;
- Description, pictures, diagrams, or other means to identify the ADS-DVs;
- Locations of or methods for determining contact information to reach fleet operations;
- Instructions for disabling the ADS-DVs;
- Methods for accessing required documentation such as owner or service provider information, vehicle registration, and proof of insurance;
- Means for de-powering the ADS-DVs;
- Instructions for moving ADS-DVs from the roadway;
- The means for determining the presence of passengers and how first responders may assist them with exiting the vehicle;
- Special considerations for extricating passengers from the ADS-DV;
- Considerations for firefighting on or around ADS-DVs;
- Safe towing of ADS-DVs;
- Descriptions of how to communicate the ADS-DVs release after the vehicle has been signaled and pulled over;
- Description of the process to access ADS data during/after first responder interactions; and
- Any other considerations.

While most states do not explicitly require LEIPs, several states have required LEIPs as part of the requirements for testing and/or deployment of AVs. Even for the states that do not have specific statutory requirements for an LEIP for fully automated vehicles, safety issues and interactions are often addressed in other ways. For example, Ohio does not currently have a specific statutory requirement for an LEIP, but according to Executive Order 2018-04K,[22] companies must register with DriveOhio and provide a safety plan, which includes procedures for how the vehicle interacts with traffic laws and law enforcement. Similarly, Texas state law does not explicitly mandate a standardized, state-wide LEIP for AVs. However, under Senate Bill 2807 (2025),[23] companies must receive authorization for commercial operation, and cities like San Antonio and Austin are training personnel on vendor-specific interaction protocols to handle emergency scenarios.

Components of West Virginia's LEIP include:[24]

- How to communicate with a fleet support specialist who is available during the times the vehicle is in operation;
- How to safely remove the fully autonomous vehicle from the roadway and steps to safely tow the vehicle;
- How to recognize whether the fully autonomous vehicle is in autonomous mode; and
- Any additional information the manufacturer or owner deems necessary regarding hazardous conditions or public safety risks associated with the operation of the fully autonomous vehicle.

[22] DriveOhio Executive Order 2018-04K (2018). Executive Order 2018-04K | DriveOhio
[23] Texas Senate Bill 2807 (2025). Bill Text: TX SB2807 | 2025-2026 | 89th Legislature | Enrolled | LegiScan
[24] West Virginia Code Article 1. Fully Autonomous Vehicles §17H-1-5. (2022). *Operation of fully autonomous vehicles without a human driver.* https://code.wvlegislature.gov/17H-1-5/

New York State's LEIP is required as part of the process to apply for a permit. Components of the plan include but are not limited to:[25]

1. Contact phone number for the representative responsible;
2. How the vehicle will be identified/distinguished from other conventional vehicles;
3. How to safely immobilize, disable and tow the vehicle if it is involved in a crash;
4. How to recognize the vehicle is being operated in an autonomous mode;
5. How to disengage an autonomous mode in the even the operator is incapacitated; and
6. Any other public safety concerns during operation or in the event of a collision, including any that may impact law enforcement, fire, EMS, or towing professions.

Some states have additional requirements built into the interactions with regard to law enforcement and safety. For example, in California, AV companies are required to respond within 30 seconds to law enforcement calls, must comply within 2 minutes of receiving an emergency geofence message and leave/avoid the area identified, and must also report on their ability to meet these metrics.[26]

Key Considerations:

- Require FRIPs as part of the application process, with information consistent with that of AVSC Best Practices.
- Ensure MOEs submit and provide training to first responders in the localities in which they operate.
- Require FRIPs to be reviewed regularly by the demonstration and testing entities and updated as needed to ensure safety, but at least annually.

States with similar requirements: California, Arizona, New Mexico, Kansas, Oklahoma, Mississippi, Kentucky, West Virginia, Pennsylvania, New York, Massachusetts, New Hampshire, Maine

Agency oversight: Virginia DMV, Virginia State Police, and other emergency personnel entities

Legislative or Regulatory: Legislative (requirement) and Regulatory (components) or Legislative (requirements and components)

State Domain Issue: Financial Responsibility (Liability)

Objective: To clarify the liability coverage requirement for AVs, which proves financial responsibility for the vehicles before operating on public roads.

Background: Continuity of insurance coverage is important regardless of whether a vehicle is in automated or manual mode, and there should not be uncertainty regarding who is insured and where coverage applies, to ensure liability and timeliness by which accident victims are compensated. Current insurance requirements are outlined in Title 46.2, Chapter 21 of the Code of Virginia.

There is a range of liability requirements for AVs, from the same liability coverage as nonautomated vehicles to requiring a $10 million umbrella policy. In some states, the liability coverage requirements

[25] New York State Autonomous Vehicle Technology Demonstration/Testing Permit. Autonomous Vehicle Technology Demonstration / Testing Permit | NY DMV
[26] California Autonomous Vehicle Codes (2025). California Vehicle Code section 38751

can also vary depending on if the vehicle is intended for personal or commercial use. Table 3 provides a summary of state liability coverage requirements.

Table 3. Summary of State Liability Coverage Requirements (adapted from the Insurance Institute for Highway Safety[27] and updated)

Liability Coverage Requirements	States
Same liability coverage as nonautomated vehicles	Arizona, Georgia, Hawaii, Kansas, Iowa, Michigan, Mississippi, Missouri, Nebraska, North Carolina, North Dakota, Ohio, Rhode Island, South Dakota, Tennessee, West Virginia
Same liability coverage as nonautomated vehicles; 1954.051 of Texas Insurance Code requires rideshare companies to carry liability coverage of $1 million	Texas
Same liability coverage as nonautomated vehicles plus additional coverages including $10 million umbrella	Massachusetts
$750,000 to $5 million based on vehicle type and commercial purpose (per 49 C.F.R. § 387.9)	Arkansas
$1 million	Florida, Kentucky, Oklahoma, Pennsylvania, Utah
$2 million	Alabama, Louisiana
$5 million	California, Colorado, Connecticut, District of Columbia, Maine, Maryland, New Hampshire, Nevada, New Mexico, New York, Oregon, Vermont, Washington
Not specifically addressed	Alaska, Delaware, Idaho, Illinois, Indiana, New Jersey, Minnesota, Montana, South Carolina, Virginia, Wisconsin, Wyoming

Key Considerations:

- Existing tort law principles have been applied to AVs and should continue to apply to AVs; distinct liability standards are not necessary and are not reflected in other state AV laws.
- Require clear requirements for liability coverage as part of the application process.

Agency oversight: Virginia DMV

Legislative or Regulatory: Legislative

[27] Insurance Institute for Highway Safety (2026). *Highly automated vehicles: Laws and regulations*. https://www.iihs.org/research-areas/advanced-driver-assistance/highly-automated-vehicle-laws

FALLBACK-READY TEST OPERATOR CONSIDERATIONS

State Domain Issue: Licensing Requirements for Fallback-ready Test Operators

Objective: Ensure that fallback-ready test operators involved with testing operations are licensed to operate the class of vehicle in question and have received training from the MOE on the specific AV to be operated.

Background: To identify individuals driving on Virginia's roads and to certify that they are capable of operating a motor vehicle. §46.2-300 notes that no person except those exempted in §46.2-303 through §46.2-308 shall drive any motor vehicle on any highway in the Commonwealth until such person has applied for a driver's license, as provided in this article, satisfactorily passed the examination required by §46.2-325, and obtained a driver's license, nor unless the license is valid. §46.2-307 extends reciprocal driving privileges to those nonresidents licensed under laws of their home state or country. Further, §46.2-341.7 notes that "no person shall drive a commercial motor vehicle (CMV) in the Commonwealth unless he has been issued a commercial driver's license or commercial learner's permit and unless such license or permit authorizes the operation of the type and class of vehicle so driven, and unless such license or permit is valid."

Level 4 and Level 5 ADS-equipped vehicles that are designed to accommodate operation by a driver (whether in-vehicle or remote) may require the vehicle to be operated when an ADS is installed on a motor vehicle but not engaged. Additionally, a human operator may perform the DDT fallback when circumstances allow this to be done safely. This operation by a fallback-ready driver would be completed by a licensed human driver ready to take control of the vehicle if the need arises. The licensed driver should have a license with the endorsement or classification corresponding to the class of vehicle to be operated.

Because full implication of endorsements or restrictions for ADS-equipped vehicles is not well known, and to avoid the risk of creating conflicting jurisdictional endorsements and restrictions, AAMVA does not recommend driver's license endorsements and restrictions at this time.

Key Considerations:

- Require a standard government issued driver's license, with license number and the state in which it was issued, corresponding to the vehicle class to be operated.
- Require company self-certification that all employees, contractors, or other persons designated to operate their Level 4 or Level 5 vehicles received training and instruction related to, but not limited to, the operation, capabilities, and limitations of the vehicles being tested (see section on training for training-related recommendations).
- Require notification of additional drivers or operators that may be added during the deployment.

States with similar license requirements: Alabama, Arizona, Arkansas, California, Connecticut, Florida, Hawaii, Illinois, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Nevada, New Hampshire, New Jersey, New Mexico, New York, Oregon, Pennsylvania, Rhode Island, South Carolina, Vermont, Washington, Wisconsin, Wyoming

Agency oversight: Virginia DMV

State Domain Issue: Training Requirements for Fallback-ready Test Operators

Objective: Provide added safety safeguards by requiring certification from each organization that each fallback operator has been properly trained to operate the ADS-equipped vehicle.

Background: Additional safety safeguards would be provided to the state by requiring certification that each fallback operator has been properly trained to operate the ADS-equipped vehicle. Requiring specialized training is consistent with current training requirements for CMVs within the Commonwealth. For example, the "Virginia Commercial Driver's License (CDL) Act" establishes state requirements for operating CMVs and requires compliance with federal standards by requiring drivers to pass strict medical, written, and road skills tests to safely operate heavy or hazardous vehicles. Drivers are required to hold an active CDL when they are driving:

- Class A vehicles that are used to tow heavy weight. The total weight of all vehicles must exceed 26,000 pounds for this rule to apply. In addition, the towed vehicle must weigh more than 10,000 pounds.
- Class B vehicles that weigh more than 26,000 pounds and tow other vehicles under 10,000 pounds.
- Class C vehicles that transport 16 or more passengers or are used in the conveyance of hazardous materials.
- Class D vehicles used for private passengers with a dedicated driver.

Taxicab operators (i.e., those individuals transporting passengers in vehicles that are designed to transport no more than six passengers, excluding the driver) are also required to follow specific operational requirements.[28]

In terms of AVs, the AVSC provides a best practice for MOEs to follow in the selection, training, and oversight of in-vehicle test operators.[29]

Key Considerations:

- Consider reciprocity options, especially with the District of Columbia and Maryland.
- Require that the AV developer has created a fallback-ready test operator training program that meets minimum requirements set by the Department or is reasonably equivalent thereto and each test operator or remote operator shall successfully complete the training program before testing with an associated AV in the Commonwealth (District of Columbia).
- Require self-certification that AV training has been provided to the employees, contractors, or other persons designated by the manufacturer or other entity as operators of the test vehicle (Maryland, California[30]).
- Require that test AVs be operated solely by employees, contractors, or other persons designated by the AV manufacturer or any such entity involved in the testing of the AV.[31]

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[28] Virginia Department of Motor Vehicles (2026). *Taxicab*. https://www.dmv.virginia.gov/businesses/motor-carriers/intrastate/taxi-cab

[29] Automated Vehicle Safety Consortium (2019). *In-vehicle fallback test driver selection, training, and oversight procedures for automated vehicles under test* (AVSC00001201911). https://avsc.sae-itc.com/publication/avsc00001201911

[30] California Code of Regulations tit. 13, §227.32 (d). (2018). *Requirements for Autonomous Vehicle Test Drivers.*

[31] AAMVA (2024, March). *Guidelines for regulating vehicles with Automated Driving Systems. Edition 4.* https://www.aamva.org/getmedia/c95fd480-5917-471a-b7ee-da88ec6cb7b5/Guidelines-for-Regulating-Vehicles-with-Automated-Driving-Systems-Ed-4_final.pdf

- Training and instruction for those operating AVs may include, but are not limited to:
  - **Takeover and disengagement training:** The fallback-ready test operator must demonstrate the ability to quickly take control when the ADS fails or encounters situations where intervention is necessary.
  - **System capabilities and limitations:** The fallback-ready test operator should have in-depth training on applicable enabling sensors (e.g., LIDAR, cameras, radar) and the ADS system in the vehicle to be operated.
  - **ODD knowledge:** Training on specific conditions (weather, time of day, road type) where the AV is designed to operate safely.
  - **Emergency response procedures:** Training for law enforcement interaction, accident protocols, and managing vehicle malfunctions.
  - **Situational monitoring:** Maintaining high attentiveness, even when systems are engaged, to recognize potential hazards the ADS might miss.
  - **Defensive driving techniques:** Specialized training for handling vehicles on unimproved roads, maneuvering in reverse, and emergency braking technique

States with similar license requirements: California, District of Columbia, Hawaii, Illinois, Maryland, New Mexico, New York[32]

Agency oversight: Virginia DMV

AV Safety-related Considerations

State Domain Issue: Safety Self-certification Clauses

Objective: To certify that vehicles meet safety requirements and are able to safely operate and drive on Virginia's roads.

Background: Self-certification allows entities to formally declare that certain conditions or standards have been met without requiring certification or verification by a third party, and that the certifying party assumes responsibility for the accuracy of their statement. Self-certification with FMVSS is the current standard with conventional vehicles, which allows for AVs to fit into the pre-existing framework. Self-certification allows for the practical realities of rapidly evolving technology such as automation.

The AVSC provides best practices related to the development and assessment of AV safety cases:

- *Metrics and Methods for Assessing Safety Performance of Automated Driving Systems (ADS),* which "[R]ecommends a set of metrics that may be used to assess ADS safety performance of the dynamic driving task (DDT). These metrics and methods are principally designed to provide evidence of safety performance for a manufacturer's decision to deploy (and monitor) fleet-operated/managed SAE level 4 and 5 ADS-dedicated vehicles (ride-hailing or product delivery)."[33]

[32] New York City Department of Transportation (2026). *Autonomous Vehicles in New York City*. https://www.nyc.gov/html/dot/html/motorist/autonomous-vehicles.shtml

[33] Automated Vehicle Safety Consortium (2025). *Metrics and methods for assessing safety performance of automated driving systems (ADS)* (AVSC00006202103). https://avsc.sae-itc.com/publication/avsc00006202103

- *Assessment of Automated Driving System-Dedicated Vehicles (ADS-DVs) Safety Case Claims Supported by Evidence (CSE)*, which "defines best practices for evaluating the quality, coherence, and sufficiency of its safety claims and the evidence used to support them."[34]

Certain states, like Florida, require little additional information beyond the FMVSS self-certification process. Other states, like Texas, require additional authorization for commercial vehicles in addition to self-certification. Some states, like Maryland, as well as the District of Columbia, require additional self-certification as part of the permitting process. In Maryland, the permitting process includes the following self-certification components:[35]

- The AV safety training has been provided to the employees, contractors, or other people designated by the manufacturer or other entity as operators of the test vehicles.
- Each vehicle meets all the applicable FMVSS or equivalent; or it is subject to exemption from such standards by NHTSA.
- A reasonable measure of previous testing of the technology in the test vehicles has been performed under controlled conditions that simulate the real-world conditions (various weather, types of roads, times of day/night, etc.) to which the applicant intends to subject the vehicle on public roadways, prior to testing on roadways open to public travel.
- The points within the Safety Assessment Letter submitted to NHTSA for the test vehicles have been addressed (including but not limited to object detection, minimum risk condition, validation methods, data recording, post-crash behavior, privacy, system safety, vehicle cybersecurity, crashworthiness, ethical considerations, and compliance with federal, state and local laws).

In the District of Columbia, the legislative code creates an Autonomous Vehicle Testing Program to develop the permitting application process (which is still in the process of being implemented) for testing entities. When implemented, the permitting process will require the following self-certified information for AVs:[36]

- A safety and risk mitigation assessment that addresses functional safety and cybersecurity risks, or the AV testing entity's most recent Voluntary Safety Self-Assessment, as described by the National Highway Traffic Safety Administration;
- Vehicles comply with all applicable FMVSS, including reference to an applicable exemption granted by the National Highway Traffic Safety Administration, if any;
- Vehicles are capable of being operated in compliance with the applicable traffic and motor vehicle laws of the District, regardless of whether the vehicle is under autonomous operation;
- Vehicles shall be tested with either a test operator physically present in the vehicle or with a remote operator;
- When a test operator is physically present in the autonomous vehicle, safely alert the test operator of a performance-relevant failure that renders the autonomous driving system unable to safely perform the entire dynamic driving task or when the vehicle operates outside of its operational design domain, and when the alert is given, achieve a minimal risk condition or require the test operator to take control of the vehicle; or

[34] Automated Vehicle Safety Consortium (2025). *Assessment of automated driving system-dedicated vehicles (ADS-DVs) safety case claims supported by evidence (CSE)* (AVSC-D-04-2025). https://avsc.sae-itc.com/publication/avsc-d-04-2025

[35] Maryland Department of Transportation (2026). *Permit process for testing highly automated vehicles (HAVs) in Maryland.* *https://cav.mdot.maryland.gov/wp-content/uploads/2022/10/PermitProcessforTestingHAVs.pdf*

[36] Code of the District of Columbia § 50–2352.01 (2026). *Autonomous Vehicle Testing Program.* Autonomous Vehicle Testing Program. | D.C. Law Library

- When a test operator is not physically present in the autonomous vehicle, achieve a minimal risk condition in the event of a performance-relevant failure that renders the autonomous driving system unable to safely perform the entire dynamic driving task or if the vehicle operates outside of its operational design domain;
- Vehicles have been previously tested with a test operator physically present in the vehicle within the operational design domain in which the AV testing entity has been permitted to operate, and the autonomous vehicle testing entity shall have reasonably determined that the vehicle is capable of safe operation within the parameters of the operational design domain without a test operator physically present;
- Vehicles shall be equipped with a mechanism to capture and store sensor data from the relevant period preceding a crash between the vehicle and another vehicle, object, or person while the vehicle is under autonomous operation;
- Vehicles shall create a test operator training program that meets minimum requirements as set by the Department or is reasonably equivalent thereto and each test operator or remote operator shall successfully complete the training program before testing with an associated autonomous vehicle in the District; and
- The AV testing entity shall have the ability to respond to a judgment for damages, personal injury, death, or property damage from the operation of an autonomous vehicle on public roadways in the amount of $5 million.

California requires extensive permitting and reporting self-certification that also includes the annual certification of reports of vehicle disengagement from autonomous mode during tests.[37] Testing entities must also certify that that the vehicle is equipped with a communication link between the vehicle and a remote operator to provide information on the vehicle's location and status and to allow two-way communication between the remote operator and any passengers if the vehicle experiences any failures that would endanger the safety of the vehicle's passengers or other road users while operating without a driver.[38]

Key Considerations:

- Determine what information is required as part of the self-certification (e.g., certain number of miles driven; demonstrations within specific ODDs, additional data submitted as part of the State Domain Issue: Crash, Incident, and Disengagement Data Reporting and Retention requirements).
- Require the MOE to certify that the vehicles comply with all applicable FMVSS, including reference to an applicable exemption granted by the National Highway Traffic Safety Administration (NHTSA), if any;
- Require certification that the AV is capable of being operated in compliance with the applicable traffic and motor vehicle laws of the Commonwealth, regardless of whether or not the vehicle is under automated operation.
- Require the MOE to certify that all employees, contractors, or other persons designated to operate Level 4 or Level 5 vehicles have received appropriate training (see also the sections on permit requirements and fallback-ready test operator training).

[37] California Department of Motor Vehicles (2026). *Autonomous Vehicles*. Autonomous Vehicles - California DMV
[38] California Code § 38755 (2025). *Autonomous Vehicles*. California Vehicle Code section 38755

States with similar safety self-certification requirements: Alabama, Arizona, California, District of Columbia, Florida, Georgia, Hawaii, Iowa, Kansas, Kentucky, Maine, Maryland, Massachusetts, Michigan, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, South Dakota, Utah, Vermont, West Virginia,

Agency oversight: Virginia DMV in coordination with VDOT

State Domain Issue: Crash, Incident, and Disengagement Data Reporting and Retention

Objective: Ensure that MOEs report crashes in a manner consistent with non-AVs. Identify geographic areas and circumstances (e.g., lighting, infrastructure, weather, situations) when AVs are involved in crashes and where AVs encounter incidents and disengagements.

Background: States provide specific guidance for crash reporting requirements for crashes resulting in bodily injury, serious bodily injury, death, or damage to property.[39,40] However, reporting thresholds vary across the states.[41] Within Virginia, accidents that occur on public highways and involve on of the following are required to be reported to the DMV using form FR200:[42]

1. Death or injury to a person;
2. Total property damage that results in ≥$1,500 in property damage;
3. Hit and run resulting in $500 or more in damage; and
4. Hazardous materials.[43]

The Virginia DMV maintains the official record of all reportable crashes occurring within the Commonwealth.

Looking specifically at AV reporting requirements, at the federal level, NHTSA's SGO requires MOEs to report certain crashes involving vehicles equipped with ADSs or SAE Level 2 advanced driver assistance systems (ADAS).[44] At the state level, within the last 6 months, Texas and California released updated AV-related regulations. Texas requires that AV crashes that result in injuries, death, or ≥$1,000 in property damage be reported. Law enforcement is to submit a CR-3 crash report within 10 days of an incident. California's reporting requirements focus on new safety metrics, including system failures,

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[39] Pennsylvania Department of Transportation (2024). *Highly automated vehicle accident reporting guidelines*. https://www.pa.gov/content/dam/copapwp-pagov/en/penndot/documents/research-planning-innovation/researchandtesting/autonomous_vehicles/documents/highly%20automated%20vehicle%20accident%20reporting%20guidelines%20-%2009-2024.pdf

[40] California Department of Motor Vehicles (2026). *New autonomous vehicle regulations strengthen oversight and enforcement, authorize trucks and transit.* https://www.dmv.ca.gov/portal/news-and-media/new-autonomous-vehicle-regulations-strengthen-oversight-and-enforcement-authorize-trucks-and-transit/

[41] Blanco, M., Atwood, J., Russell, S., Trimble, T., McClafferty, J., & Perez, M. (2016, January). *Automated vehicle crash rate comparison using naturalistic data*. Virginia Tech Transportation Institute. https://vtechworks.lib.vt.edu/items/d33dc4e1-58f3-4813-9677-4a0f425880c7

[42] Virginia Department of Motor Vehicles (2020). *Voluntary report of a crash (FR 200).* https://www.dmv.virginia.gov/sites/default/files/forms/fr200.pdf

[43] Note: §46.2-373 of the Code of Virginia requires that a law enforcement officer who in the course of his/her duties investigates a motor vehicle accident resulting in injury or death to any person or total property damage of $1,500 or more will file an accident report within twenty-four (24) hours of the completion of the investigation.

[44] NHTSA (2025). *Standing General Order on crash reporting for incidents involving ADS and Level 2 ADAS.* https://www.nhtsa.gov/laws-regulations/standing-general-order-crash-reporting

vehicle immobilizations, and hard braking events, and also expand collision reporting and require data on vehicle miles traveled. Specific requirements include the following:[45]

- **Safety Metrics vs. Disengagements:** Manufacturers must now report specific, precise safety-relevant events, including hard braking events (defined as deceleration >5 m/s² for at least 0.5 seconds on roads with ≥ 35 mph speed limits) and system failures, replacing older, broader "disengagement" reports.
- **Immobilization Reporting:** Data on all vehicle immobilizations occurring during both driverless and drivered testing/deployment must be submitted.
- **Collision Data:** Reports must align with the NHTSA SGO June 2025 version.
- **Operational Data:** Mandatory reporting of total vehicle miles traveled during both testing and deployment phases.
- **Law Enforcement Interaction:** AV companies are required to respond within 30 seconds to law enforcement calls and report on their ability to meet this metric.
- **Traffic Citations:** Effective July 1, 2026, law enforcement can issue "Notices of AV Noncompliance" for moving violations directly to the manufacturer, which will be logged as part of their compliance reporting.

Like California, Colorado also requires specific safety reporting for AVs involved in testing. MOEs must detail how they detect and handle disengagements on curves or different road conditions along with a list of past incidents.[46]

The Commonwealth may see additional safety-related benefits by tracking the circumstances where AVs have incidents and/or disengagements. This information may be used to help AV developers improve their ADS. Information may also be used by the Commonwealth to identify potential ODD constraints (e.g., time of day, weather, lighting), situational concerns (e.g., interactions with first responders, curb management), or infrastructure improvement needs (e.g., lane markings, other roadway furniture needs). Roadway (or street) furniture refers to all non-structural objects and equipment installed on, along, or above roads and verges to manage traffic, enhance safety, and provide guidance. Examples include safety and control features (e.g., crash barriers, guardrails), traffic management (e.g., traffic signals, signs), navigation (e.g., street signs, warning signs, raised road markers), and amenities (e.g., streetlights, bus stops).[47]

Considerations regarding the public's interest in terms of interactions with AVs during crashes and/or incidents have more recently come to light. For example, California also requests feedback from the public regarding their experience with AVs operating on California public roads via an AV Incident

[45] California Department of Motor Vehicles (2026). *New autonomous vehicle regulations strengthen oversight and enforcement, authorize trucks and transit.* https://www.dmv.ca.gov/portal/news-and-media/new-autonomous-vehicle-regulations-strengthen-oversight-and-enforcement-authorize-trucks-and-transit/

[46] Colorado Autonomous Mobility Task Force (2024). *Autonomous Mobility Task Force application.* https://www.codot.gov/programs/innovativemobility/assets/automated-task-force-application-updated-2024.pdf

[47] Hornbeck Group (2025). *What is street furniture and why is it important*. https://hornbeckgroup.com/blog/what-is-street-furniture

Form.[48] Additionally, results from the District of Columbia's research report, State of U.S. AV Policy,[49] include the need for consumer protection policies for AV-related incidents: "For example, if an AV is involved in a minor collision, such as a rear-end crash, there must be a clear process for the human driver to receive insurance information and resolve the situation, even though no human is driving the AV."

Key Considerations:

- The legislation should provide data retention and sharing requirements, within the operative sections of the legislation.
- Require collision reporting in a manner consistent with NHTSA's SGO and current Virginia requirements.
- Based on the findings of the concurrent HB2627 Safety Report, consider what additional data, if any, should be collected.
- Provide a means for the public to report their experience with AVs operating on Virginia public roads.

States with disengagement reporting: California, Colorado

Legislative or Regulatory: Legislative

Agency oversight: Virginia DMV, VDOT, and Virginia State Police

State Domain Issue: Enforcement of Compliance with Rules of the Road, Federal and State CMV Requirements, and ODD Restrictions

Objective: Ensure a process for issuing a Notice of AV Noncompliance to MOEs when AVs commit a moving violation.

Background: To ensure that AVs operate safely and to guarantee the safety of other road users, a standard requirement during the permitting process is to request self-certification that the AV can operate in accordance with the rules of the road associated with the noted ODD and comply with applicable federal and state CMV requirements (e.g., stopping at weight stations).

Several instances have been documented where AVs have impeded the flow of traffic or violated other rules of the road. To address situations such as this, states like California have established a process for law enforcement to issue a Notice of AV Noncompliance when an AV commits a moving violation or fails to otherwise comply with applicable state and federal CMV requirements (e.g., stopping at work zones). Effective July 1, 2026, California will permit law enforcement to issue these noncompliance notifications directly to the manufacturer, who will then log the notices as part of their annual

[48] California Department of Motor Vehicles (2026.). *Autonomous Vehicles Incident Form*. https://www.dmv.ca.gov/portal/dmv-autonomous-vehicles-feedback-form/

[49] Buckley, S. (2026). *Research report: State of U.S. automated vehicle policy* (Research Report 26-01). District Department of Transportation. https://ddot.dc.gov/sites/default/files/dc/sites/ddot/DDOT%20Research%20Report%20State%20of%20U.S.%20Automated%20Vehicle%20Policy_April%202026.pdf

compliance reporting.[50] California also permits the DMV to impose targeted operational restrictions on MOEs (e.g., fleet size, location, speed, weather limits) when necessary for public safety.

Similarly, Maine provides additional safety restrictions on AV testing, including permitting a local municipality, city, or operating agency to request a temporary restriction on the testing of AVs for emergencies, special events, or safety concerts. Further MOEs may not test in complex and/or irregular work zones or during weather emergencies.[51] In these situations, the MOE should be told the details of the restrictions (e.g., where, when, for how long) in sufficient time to ensure compliance.

Further, The Commercial Vehicle Safety Alliance (CVSA) has established an Enhanced CMV Inspection Program for Autonomous Truck Motor Carriers. This program "establishes a no-defect, point-of-origin inspection program for ADS-equipped CMVs" that "includes an enhanced inspection standard and procedure for motor carriers operating ADS vehicles and a 40-hour CSVA training course and exam for motor carrier personnel who will be conducting the inspections."[52]

Key Considerations:

- Provide a process for law enforcement to issue notices of AV noncompliance.
- As part of compliance reporting, require MOEs to report notices of AV noncompliance.
- Ensure any ODD restrictions are conveyed to the MOE with sufficient time to ensure compliance.
- Adopt inspection programs consistent with industry best practices.

States with similar requirements: California, Texas

Agency oversight: Virginia DMV and Virginia State Police in cooperation with VDOT

OTHER CONSIDERATIONS

State Domain Issue: Sales Tax, Business Personal Property Tax, and Other Fees

Objective: Determine what sales taxes, business personal property taxes, and other fees may apply to AV rides provided or vehicles that are hosted and maintained at an AV depot within the Commonwealth.

Background: A Pew Charitable Trust-sponsored examination of the potential impact of AVs on state revenue noted that the increased use of AVs may reduce fuel tax revenue and sales taxes and registration fees. To offset these potential revenue reeducations, policymakers could level vehicle-mile taxes, congestion charges, or taxes on TNCs.[53] In looking at state-specific permit and application fees, the

[50] California Code, Vehicle Code. § 38752 (2025). *Autonomous Vehicles Section* California Vehicle Code section 38752
[51] Maine State Legislature H.P. 1204 (2017). https://custom.statenet.com/public/resources.cgi?id=ID:bill:ME2017000H1204&ciq=ncsl&client_md=69cc78ce6a23e4ebc76b3cf658017877&mode=current_text
[52] Commercial Vehicle Safety Alliance (CVSA) (2022, October 4). *CVSA announces new Enhanced Commercial Motor Vehicle (CMV) Inspection Program for Autonomous Truck Motor Carriers*. https://cvsa.org/news/new-enhanced-cmv-inspection-program/
[53] Fox, W. (2019). *The influence of autonomous vehicles on state tax revenue.* The Pew Charitable Trusts. https://www.pew.org/en/research-and-analysis/white-papers/2019/12/how-autonomous-vehicles-may-impact-state-revenue

amount required varies and may be split between administrative and registration costs and specific permit fees, for example:

- **California:** Nonrefundable application fee and biennial renewal fee of $3,600 (covering up to 10 vehicles and 20 operators). Additional $50 fee for each additional set of 1–10 vehicles and 1–20 drivers. Processing fee of $70 for changes or modifications to the testing permit. Permit fee of $3,275 for post-testing deployment.
- **Nevada:** Payment of a $100 testing fee (new and renewal) and $20.50 per vehicle for testing license plates.
- **New Hampshire:** Annual fee of $500.
- **New York City:** Requires a New York City DOT testing permit and an annual fee of $5,000.

Key Considerations:

- Consider imposing a per-ride sales tax for each on-demand AV TNC ride; non-AV TNC rides could be exempted.
- Consider imposing generally applicable business personal property tax applied by a local jurisdiction on tangible personal property. This tax would only apply to those AVs that are hosted and maintained at an AV depot within the Commonwealth, not AVs transiting to or through a jurisdiction.
- Consider if other AV permit/application/registration fees may be appropriate.

Agency oversight: Legislative

State Domain Issue: Restrictions on Non-drivers to Be Passengers

Objective: Ensure the safety of passengers within motor vehicles.

Background: AAMVA recommends that jurisdictions not impose any other requirements (e.g., licensure, sobriety, clean driving history) for nondrivers to be passengers in ADS-DVs. AAMVA notes the comparability of riding as a passenger in an ADS-DV to taking a taxi, riding a bus, or riding a subway, none of which requires special training to be a passenger/rider.[54]

In regard to restrictions on unsupervised children that may be placed in an ADS-DV, AAMVA suggests that jurisdictions review their laws and regulations related to unsupervised children in motor vehicles to ensure safety.[55] Virginia, the District of Columbia, and West Virginia do not currently provide guidance on the age of unattended children in vehicles. However, several surrounding states do:

- North Carolina[56] provides the following guidance: "It is unlawful for any parent or legal guardian of a person less than 12 years of age to knowingly permit that person to occupy a fully

[54] AAMVA (2024, March). *Guidelines for regulating vehicles with Automated Driving Systems. Edition 4.* https://www.aamva.org/getmedia/c95fd480-5917-471a-b7ee-da88ec6cb7b5/Guidelines-for-Regulating-Vehicles-with-Automated-Driving-Systems-Ed-4_final.pdf

[55] AAMVA (2024, March). *Guidelines for regulating vehicles with Automated Driving Systems. Edition 4.* https://www.aamva.org/getmedia/c95fd480-5917-471a-b7ee-da88ec6cb7b5/Guidelines-for-Regulating-Vehicles-with-Automated-Driving-Systems-Ed-4_final.pdf

[56] N.C.G.S. § 20-401(d) (2017)

autonomous vehicle in motion or which has the engine running unless the person is under the supervision of a person 18 years of age or older."

- In Maryland, a child under 8 is considered unattended if not supervised by someone at least 13 years old.[57]
- In Pennsylvania, no child under six years of age may be left in a car alone when the person responsible is out of sight of the car and "under circumstances which endanger the health, safety or welfare of the child."[58]

Further, several ridesharing companies and taxi services have their own requirements, which may vary by location. For example, teens in Phoenix between the ages of 14 and 17 can travel independently via Waymo when the teen is linked to a parent or guardian's account.[59] However, in California, as of May 2026, unaccompanied minors are not permitted to ride unaccompanied in AVs regardless of parental consent or who books the ride.[60]

Uber offers teen accounts for the District of Columbia; Baltimore, Maryland; and the cities of Charlottesville-Harrisonburg, Hampton Roads, Richmond, and Roanoke, Virginia. Under teen accounts, riders aged 13 to 17 may ride unaccompanied with a parent or legal guardian's permission.[61] Where available, Lyft Teen offers similar accommodations for unaccompanied teens.[62]

Key Considerations:

- Consider applying existing requirements for TNCs to AVs operating in ride share models (i.e., on-demand AV networks) or transit.

Agency oversight: Virginia DMV

Legislative or Regulatory: Does not need to be defined in AV legislation if following the prevailing approach to on-demand AV network regulation across the country.

State Domain Issue: Data Privacy & Protection

Objective: Ensure data privacy and cybersecurity to protect the safety of the consumers.

Background: Several transportation features (e.g., location trackers, attention sensors, cruise control, onboard cameras, active recordings, fuel efficiency metrics, tire pressure sensor data, etc.) gather data to benefit the vehicle passengers and to make rides safe, efficient, and pleasant, but concerns remain as to whether or not the data gathered from the vehicle instrumentation remains private. Data privacy and cybersecurity threats occur at a rapid pace of change that is difficult to manage, which requires timely security system updates. Most states do not have explicit AV data privacy policies, but rather focus primarily on the operational safety, insurance, and law enforcement aspects of how AVs behave and report safety-relevant data. General data privacy associated with AVs (personal data usage, surveillance

[57] Md. Code Ann., Fam. Law § 5-801 (2025)
[58] 75 Pa.C.S. § 3701.1 (2026).
[59] Waymo (2025, July 8). *Waymo teen accounts offer peace of mind for Phoenix families.* https://waymo.com/blog/2025/07/waymo-teen-accounts/
[60] Waymo (n.d.). *Waymo rider rules.* https://support.google.com/waymo/answer/9197501
[61] Uber (n.d.). *Teen accounts on Uber*. https://www.uber.com/us/en/drive/services/teens/
[62] Lyft (n.d.). *Introducing Lyft teen: Rides for teens. Designed with parents in mind.* https://www.lyft.com/rider/teen

concerns, passenger rights, data monetization) often falls under current state and federal data privacy laws, which often requires consent before processing personal data.

Several states, however, do require additional information and/or certifications with regard to the data privacy and cybersecurity of AVs. Maryland's permitting process[63] includes self-certification of appropriate privacy considerations and protections for AV users, as well as vehicle cybersecurity approaches to guard against vehicle hacking risks. Colorado encourages applicants to "maintain adequate cybersecurity protocols and to stop the vehicle immediately upon a breach of cybersecurity or to allow the vehicle(s) to be stopped immediately by a human operator. MOEs are asked to provide information about the approach to data collection and sharing during testing and in the event of an incident or accident. MOEs are also asked to provide information about how they are approaching data security.[64] In California, Senate Bill 296, signed into law in October 2023, mandates that manufacturers and dealers disclose in-vehicle cameras to consumers and prohibits the sale or use of recorded in-vehicle images/video for advertising purposes.[65]

Key Considerations:

- Encourage MOEs and testing entities to employ data privacy and cybersecurity best practices with regard to ADS design and throughout the entire life cycle of ADS-equipped vehicles.
- Facilitate education for the public on cybersecurity awareness and the potential impact on vehicle automation.[66]
- Require self-certification that MOEs are using data privacy and cybersecurity best practices based on standards-setting bodies and maintaining adequate security protocols that ensure the safety of the ADS from unauthorized access to data or control of the vehicle.
- Ensure existing data privacy requirements in Virginia apply equally to AV companies as they do in other industry.
- Consider expanding Virginia's privacy laws to provide consumer protections for transportation-related data.

States with consumer data privacy and protection laws: Arizona, California, Colorado, Connecticut, Iowa, Maryland, Montana, New York, New Jersey, Tennessee, Texas, Utah, Virginia (health only), Washington (health only)

Agency oversight: General consumer data privacy authority with support from Virginia DMV, VDOT, and other agencies as appropriate

State Domain Issue: Arbitration

Objective: Discuss Virginia's current approach to arbitration and how existing Virginia standards should apply to the AV industry.

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[63] Maryland Department of Transportation (2026). *Permit process for testing highly automated vehicles (HAVs) in Maryland.* Permit Process for Testing HAVs

[64] Colorado Autonomous Mobility Task Force (2024). *Autonomous Mobility Task Force application.* https://www.codot.gov/programs/innovativemobility/assets/automated-task-force-application-updated-2024.pdf

[65] California Legislation Senate Bill 296 (2023). Bill Text: CA SB296 | 2023-2024 | Regular Session | Amended | LegiScan

[66] AAMVA (2024, March). *Guidelines for regulating vehicles with Automated Driving Systems. Edition 4* (See *Chapter 7.1 Other Considerations.* https://www.aamva.org/getmedia/c95fd480-5917-471a-b7ee-da88ec6cb7b5/Guidelines-for-Regulating-Vehicles-with-Automated-Driving-Systems-Ed-4_final.pdf

Background: For purposes of this discussion, the Federal Arbitration Act means 9 U.S.C. §§ 1-16, as may be amended.

Key Considerations:

- Considerations to be provided for the June Working Group meeting.

SPECIAL CONSIDERATIONS FOR LEVEL 3 VEHICLES

State Domain Issue: ADS Marker Lamps/Automated Vehicle External Indicator

Objective: Consider the use of external ADS marker lamps to indicate that a vehicle's Level 3 ADS is engaged to enhance road user awareness, support law enforcement, and facilitate safe interaction with other vehicles.

Rationale**:** Within a given ODD, there may be times when individuals in the driver's seat may not be actively engaged in the DDT because the ADS in a Level 3 ADS-equipped vehicle or dual mode Level 4 ADS-equipped vehicles is engaged. In situations such as these, the occupant in the driver's position may be mistaken for a distracted or inattentive human driver. There is thought that external signaling of ADS engagement may enhance awareness and interaction with other road users. Beginning with the 2026 model year, Mercedes-Benz will be equipping EQS and S-Class sedans with these marker lamps. Mercedes-Benz also became the first automotive manufacturer to receive approval for the ADS marker lamps in Germany.[67] Further, in looking at how road users interacted with ADS marker lights, findings associated with following distance and aggressive driving events suggest that the activation of ADS marker lights do not pose any additional risk to road safety.[68]

Several states have also provided for the use of ADS marker lamps in the context of a Level 3 ADS-equipped vehicle. Beginning in 2026, AVs in California, in partnership with Nevada, may be equipped with an ADS marker lamp in accordance with SAE J3134 and SAE J578.[69,70] Alabama[71] and Florida[72] also have similar permissions allowing vehicles to be equipped with visual indicators. AAMVA also included ADS marker lamps in their Guidelines for Regulating Vehicles with Automated Driving Systems, noting that "when authorized to do so, install ADS marking lamps to allow law enforcement to identify if an ADS-equipped vehicle is being operated by the ADS or by the driver to mitigate

[67] Mercedes-Benz (2025). *Automated driving in Germany: Approved to test special marker lights.* https://group.mercedes-benz.com/technology/autonomous-driving/driving/drive-pilot-marker-lights.html

[68] Sciortino, N., Betz, D., & Scupke, S. (2026, May 12-15). *Automated Driving System (ADS) marker lights on-road study and questionnaire* (Paper No. ESV26-268). Enhanced Safety of Vehicles, Toronto, Canada. https://static.nhtsa.gov/esv/pdf/ESV/Proceedings/28/ESV26-268%20_ADSMarkerLight_OnRoad_and_Questionnaire_Study.pdf

[69] California Code Vehicle Code § 38750 (2025). https://law.justia.com/codes/california/code-veh/division-16-6/section-38750/

[70] Nevada Senate Committee on Growth and Infrastructure (2025, February 20). *SGRI989T: Testimony of Sarah N. Peterson* (Exhibit No. SGRI989T). 83rd Session of the Nevada Legislature. https://archive.leg.state.nv.us/Session/83rd2025/Exhibits/Senate/GRI/SGRI989T.pdf

[71] Ala. Code § 32-9C-9 (2024). https://law.justia.com/codes/alabama/title-32/chapter-9c/section-32-9c-9/

[72] Fla. Stat. §319.145(1)(a)-(b) (2025).

enforcement stops for driver-centric violations, such as distracted driving. Visual or other cues should be included in the law enforcement interaction plan."[73]

At the federal level, NHTSA has issued a request for a proposal for the *Evaluation of ADS Marker Lamp Concept* project, with the objective of exploring this topic further for Level 3 vehicles. In the interim, SAE International Recommended Practice J3134 Automated Driving System (ADS) Marker Lamp and SAE International Standard J578 Chromaticity Requirements for Ground Vehicle Lamps and Lighting Equipment provide guidance for industry. However, results from this study are not anticipated for several years.

Key Considerations:

- Include language permitting MOEs to equip ADS marker lamps in accordance with SAE J3134, as may be revised, and SAE J578, as may be revised.

States with similar ADS marker lamp permitting: Alabama, California, Florida, Nevada

Agency oversight: Virginia DMV with input from Virginia State Police

[73] AAMVA (2024, March). *Guidelines for regulating vehicles with Automated Driving Systems. Edition 4* (See *Chapter 6.1 Vehicle Identification).* https://www.aamva.org/getmedia/c95fd480-5917-471a-b7ee-da88ec6cb7b5/Guidelines-for-Regulating-Vehicles-with-Automated-Driving-Systems-Ed-4_final.pdf

APPENDIX A. KEY TERMS AND DEFINITIONS

Except as otherwise noted, all definitions reflect those found in SAE J3016 and are consistent with recommendations made by AAMVA.

Authorization Holder	A person granted authorization by the Department to operate one or more AV. [*The use of the term "person" is intentional to account for corporate entities as well as universities. "Person" is already defined in the Virginia Vehicle Code, so it does not need to be separately defined in AV legislation. This is also the approach taken in AV laws across the country*].
Automated Driving System (ADS)	The hardware and software that are collectively capable of performing the entire DDT on a sustained basis, regardless of whether it is limited to a specific ODD.
Automated Vehicle Depot	A central location used by an AV fleet operator for activities including, but not limited to, general vehicle maintenance, charging, and parking.
Automated Vehicle External Indicator	A device that an AV may be equipped with that emits light to indicate when an ADS is engaged in the operation of the vehicle
First Responder Interaction Plan (FRIP)	A document of procedures specifying how first responders should interact with an AV that, at minimum, describes: (i) how to communicate with a fleet support specialist who is available during the times the AV is in operation; (ii) how to safely remove the AV from the roadway and steps to safely tow the vehicle; (iii) how to recognize whether the AV is in automated mode; and (iv) any additional information the manufacturer or fleet operator deems necessary regarding public safety risks associated with the operation of the AV.
Fully Autonomous Vehicle (AV)	A motor vehicle equipped with an ADS designed to function without a human driver as a Level 4 or 5 system under SAE J3016 or its successor standards.

Dynamic Driving Task (DDT)	All of the real-time operational and tactical functions required to operate a vehicle in on-road traffic, including: 1. Lateral vehicle motion control via steering; 2. Longitudinal motion control via acceleration and deceleration; 3. Monitoring the driving environment via object and event detection, recognition, classification, and response preparation; 4. Object and event detection and response (OEDR) execution; 5. Maneuver planning; and 6. Enhancing conspicuity via lighting, signaling, and gesturing. "Dynamic driving task" or "DDT" does not include strategic functions such as trip scheduling and the selection of destinations and waypoints. "DDT fallback" means the response by: 1. The person or human driver to either perform the DDT or achieve a minimal risk condition after the occurrence of a DDT performance-relevant system failure, or upon ODD exit; or 2. An ADS to achieve minimal risk conditions, given the same circumstances identified in subdivision.
Fallback-ready Test Operator	The user of a vehicle equipped with an engaged Level 3 ADS feature who is properly qualified and able to operate the vehicle and is receptive to ADS-issued requests to intervene and to evident DDT performance-relevant system failures in the vehicle compelling him or her to perform the DDT fallback.
Human Driver	A natural person in the vehicle with a valid driver's license for the class of vehicle being operated who controls all or part of the DDT.
Minimal Risk Condition	A condition to which a person, human driver, or an ADS may bring a vehicle after performing the DDT fallback in order to reduce the risk of a crash when a given trip cannot or should not be completed.
On-demand Automated Vehicle Network	A digital network that enables the prearrangement of transportation of passengers or goods through fully automated vehicles or ADS-equipped vehicles for compensation.
Operational Design Domain (ODD)	The operating conditions under which a given ADS is specifically designed to function, including, but not limited to, (i) environmental, geographical, and time-of-day restrictions, (ii) and/or the requisite presence or absence of certain traffic or roadway characteristics.

Remote Assistance	Event-driven provision, by a remotely located human, of information or advice to an ADS-equipped vehicle in driverless operation to facilitate trip continuation when the ADS encounters a situation it cannot manage.[74] • **Note 1:** Remote assistance does not include real-time DDT or fallback performance by a remote driver. Rather, the ADS performs the complete DDT and/or fallback, even when assisted by a remotely located human. • **Note 2:** Remote assistance may include providing an ADS with revised goals and/or tasks. • **Note 3:** The remote assistance function does not include providing strategic instruction regarding selection of destinations or trip initiation timing (i.e., dispatch functions), even if the same person performs both remote assistance and dispatching functions.
Remote Driver	A driver who is not seated in a position to manually exercise in-vehicle braking, accelerating, steering, and transmission gear selection input devices (if any) but is able to operate a vehicle. • **Note 1:** A remote driver may include a user who is within the vehicle, within line of sight of the vehicle, or beyond line of sight of the vehicle. • **Note 2:** A remote driver is not the same as a driverless operation dispatcher, although a driverless operation dispatcher may become a remote driver if [they have] the means to operate the vehicle remotely. • **Note 3:** A remote driver does not include a person who merely creates driving-relevant conditions that are sensed by, or communicated to, the ADS (e.g., a police officer who announces over a loudspeaker that a particular stop sign should be ignored; another driver who flashes [the] head lamps to encourage overtaking, or a pedestrian using a Dedicated Short-Range Communication (DSRC) system to announce [their] presence).

[74] Although the remote assistant may not provide direct operational control over the vehicle, they can provide the vehicle with alternate routes or maneuvers that the vehicle will evaluate to determine the appropriate route. The remote assistant would need knowledge and understanding of the vehicle type and roadway. For example, in the context of a CMV, the remote assistant would need to know how the size and weight of the vehicle will impact the maneuverability and particular routes the vehicle may be prompted to take. Because of the unique characteristics of vehicles and roadways, a remote assistant may need specific training, skills, and credentials, including up to proper licensing, for the vehicle type they are remotely assisting (AAMVA).

Remote Driving	Real-time performance of part or all of the DDT and/or DDT fallback (including, real-time braking, steering, acceleration, and transmission shifting), by a remote driver. • **Note 1:** A receptive remote fallback-ready test operator becomes a remote driver when they perform the fallback. • **Note 2:** The remote driver performs or completes the OEDR and has the authority to overrule the ADS for purposes of lateral and longitudinal vehicle motion control. • **Note 3:** Remote driving is not driving automation. • **Note 4:** Remote driving of a vehicle by a human is sometimes referred to as "teleoperation." However, "teleoperation" is not defined consistently in the literature, and thus, to avoid confusion, is not used herein.
Request to Intervene	A notification by an ADS to a human driver that the human driver should promptly begin or resume performance of the DDT.
Responsible Vehicle Operator (Operator)	The individual who is responsible for the safe and lawful operation of an ADS-equipped vehicle and its ADS on public ways whether that individual is inside of, or outside of, the vehicle; is physically controlling the steering, acceleration, braking, and stopping of the vehicle; is controlling these actions of the vehicle remotely; or is prepared to take control of the vehicle when the ADS performs unsafely or inappropriately or fails in any way.
SAE J3016	The "Taxonomy and Definitions for Terms Related to Driving Automation Systems for On-Road Motor Vehicles" published by SAE International on April 29, 2021, as revised, or its successor standards.