

ADDRESSING THE PATCHWORK: A STATE-BY-STATE ANALYSIS FOR AUTONOMOUS TRUCKING IN THE UNITED STATES

Coordinated
& Presented By:

ITS  AMERICA

 **AUVSI**[™]

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1. Introduction

1.1. ITS America and Association for Uncrewed Vehicle Systems International (AUVSI) workgroups have developed this report on the current landscape of State policies and regulations impacting the deployment of autonomous trucks and convoys to identify potential barriers and inconsistencies resulting from a “patchwork approach” of policies across the country. This report is intended to accomplish two goals: 1) provide external validation of the current lay-of-the-land for companies as they move towards on-road commercialization; and 2) help provide an understanding among State and local partners of potential opportunities and challenges related to the successful management of autonomous trucking policy.

The scope of this document includes state and local guidance and regulations across all 50 states and DC that could impact or serve as a barrier to autonomous trucking operations. In general, this includes requirements around platooning, automated vehicles, automated trucking, and general trucking provisions. This does not include the Federal Motor Vehicle Safety Standards or the Federal Motor Carrier Safety Regulations. State and local regulations related to autonomous trucking policy and transportation policy writ large are constantly evolving, and this report reflects a regulatory environment current as of late 2023. These policies are subject to change, and this document will certainly require revision to remain current. To that end, we encourage feedback from fellow transportation stakeholders on data within this document that need to be updated, added to, or clarified.

Special thanks to Finch Fulton, formerly of Locomotion and now a Government Affairs Advisor at K&L Gates, for leading this effort.

We hope this document will be a helpful contribution to the industry as automated transportation solutions continue to be developed and deployed across the country.

Note: for California, because L4 CMVs are not currently allowed, the future rules are inferred from those imposed upon light-duty automated vehicles.

2. Terms, Definitions and Abbreviations

Name/Abbreviation	Definitions
ADS	Automated Driving System
ADAS	Automated Driver Assist Systems
CMV	Commercial Motor Vehicle
HAV	Highly Automated Vehicle
VSSA	Voluntary Safety Self-Assessment

3. Full Review

3.1. ADS Disconnect / Disengagement Requirements

While few states have disengagement requirements, those that do revolve around ensuring disengagements and disconnects are easy to perform and drivers are trained to do so. Pennsylvania is generally the most specific in this area for platooning vehicles. In the case of disengagements, they must be recorded and reportable. California is most specific in this area for automated vehicles.

- For automated vehicles
 - In [Arkansas](#) and [California](#) disengagements should be recorded and reportable.
 - In [Nevada](#), companies must ensure means of disengagement are easily accessible to the human operator of the autonomous vehicle.
 - In [Pennsylvania](#): “the HAV [must have] a mechanism to engage and disengage the ADS that is easily accessible to the HAV safety driver, and a means for the secondary safety associate, or an Emergency Service Responder, to disengage the ADS, if necessary.
- For platooning vehicles:
 - In [Maryland](#), companies must show that the driver is trained in platoon disengagements.
 - In Pennsylvania, a [platoon](#) must disengage “To manage traffic flow and ensure road safety, platooning vehicles must disengage platooning technology when:
 - i. It is necessary to allow reasonable access for vehicles to enter or exit the highway;
 - ii. It is necessary to ensure an overtaking/cutting-in vehicle to enter and occupy the space between the two vehicles without danger;

- iii. Operating on a segment of roadway with a hazardous grade speed limit;
 - iv. Entering a Weigh Station;
 - v. Entering or driving within a work zone when workers are present, or work zone is active;
 - vi. Entering or driving within toll plazas; or,
 - vii. Complying with Department's disengagement requests.
- In [Tennessee](#), companies must describe "platoon dissolution method & fallback" as part of the notification process of an operations request.

3.2. Bridges

In this section, we looked for specific constraints related to operating on bridges, particularly for platooning CMVs. In [Pennsylvania](#), there is a requirement that each vehicle in a platoon maintain a headway of at least 40 feet when traveling over bridges. Other states have standard bridge rules: overweight vehicle restrictions, and no parking, passing, stopping within X feet rules.

The most stringent requirements include:

- No passing, stopping or parking on bridges ([Arizona](#), [Arkansas](#))
- No parking within 300 feet ([Illinois](#), [Wisconsin](#))
- Know and adhere to weight limits ([Colorado](#), [Florida](#), [Iowa](#))
- No speeding on bridges ([Georgia](#))
- Stricter speed enforcement ([Kansas](#))

3.3. Communications Equipment

Many states have laws against texting while driving or the use of phones while driving. Some states specifically authorize two-way communications between trucks.

Examples include:

- [California](#) will likely require two way communications between a remote operator and any passengers
- In [Florida](#) (316.305), a person may not operate a motor vehicle while texting, excluding navigation and safety related communications.
- In [Michigan](#), no hand-held phones are allowed, unless a driver has had to pull over and call after an incident.

3.4. Convoy Configuration

While most states do not have configuration requirements, some states with platooning legislation include a two or three vehicle restriction.

- In [Alabama](#), there is no vehicle limit, the enabling regulations allows for “group of individual commercial trucks traveling in a unified manner at electronically coordinated speeds at following distances that are closer than would be reasonable and prudent without the electronic coordination.”
- In [Florida](#), driver-assistive truck platooning technology is defined as being between “two vehicles.”
- In [Maryland](#), platoons are limited to two trucks.
- In [Kentucky](#), the rules state “A commercial motor vehicle involved in a platoon shall not draw another motor vehicle in the platoon.” The term “draw” is undefined in the statute, but likely means towing another vehicle.

3.5. Crash Reporting

Crash reporting processes must be set up to notify law enforcement immediately, and to be able to contact state authorities within two hours (or less). In general, if there are provisions related to automated vehicles, they require immediate reporting. If not, there are more delayed reporting requirements tailored to the general trucking community. Industry should expect and be ready to provide a report to the appropriate officials in any state they operate in should there be a crash that would trigger the NHTSA Standing General Order requirements.

Specific crash reporting state guidance for timing includes:

- Immediately or promptly (if involving AVs): [Alabama](#), [Arkansas](#), [Arizona](#), [California](#) (likely), [Colorado](#), [Delaware](#), [Florida](#), [Georgia](#), [Idaho](#), [Indiana](#), [Kansas](#), [Maine](#), [Michigan](#), [West Virginia](#), [New Jersey](#), [New Mexico](#), [New York](#), [North Carolina](#), [South Carolina](#), [South Dakota](#), [Tennessee](#), [Texas](#), [Utah](#), [West Virginia](#), [Wisconsin](#), [Wyoming](#)
- Immediately if the crash involves injury or death: [Alabama](#), [Oklahoma](#), [North Dakota](#), [Rhode Island](#), [Virginia](#),
- In [Pennsylvania](#), notification is due within two hours or less to the Pennsylvania Department of Transportation Statewide Traffic Management Center and Pennsylvania Turnpike Commissions Traffic Operations Center.
- Within 12 hours: [DC](#)
- Within 24 hours: [Hawaii](#)
- By close of business the next business day: [Maryland](#)
- Within 72 hours: [Iowa](#), [Oregon](#), [Vermont](#)
- Within 4 days: [Washington](#)
- Within 5 days: [Connecticut](#), [Massachusetts](#)
- Within 10 days: [Alaska](#), [Illinois](#), [Minnesota](#), [Mississippi](#), [Montana](#), [Nebraska](#), [Nevada](#)
- Within 15 days: [New Hampshire](#)
- Within 30 days: [Missouri](#)

- No specific timeframe, but still required: [Ohio](#)

3.5.1. Data Recording

Most states do not mention data recording. States that do crash data recording focus on collecting data on the events leading up to an accident or general collision reporting rather than requiring specific data elements be captured. In general, states seek enough information to understand what happened in a crash. Some states with pilot programs request data about overall operations.

Specific data recording requirements include:

- [Arkansas](#) and [South Dakota](#), as part of their pilot program, require reporting on the total number of trips, the total number of miles, the total number of disengagement of the autonomous mode, and a copy of all law enforcement accident reports that involved a vehicle operating in autonomous mode.
- [California](#), requires a data recorder for collision data in order to provide “a description of the facts causing the...emergencies, accidents or collisions. The description should be written in plain language with enough detail that a non-technical person can understand the circumstances” triggering the incident. The data recorder must be able to “record technical information about the status and operation of the vehicle’s autonomous technology sensors for 30 seconds prior to a collision.”
- Other requirements, like in [DC](#) and [Maryland](#), require sensor data “from the relevant period preceding a crash” “to understand and communicate the cause of the crash.”
- [Utah](#) and [Washington](#) recommend including privacy protections except for prosecution purposes.

3.5.2. Sensor Equipment

For this section, we focused on AV rules that specifically mention “sensors.” Not surprisingly, most states do not mention sensors; those that do focus on the expected measurements: speed, location, etc.

- [California](#) requires sensor information for “all vehicle functions” for 30 seconds leading into a collision.
- In [Maryland](#), companies must have a process for maintaining vehicle sensors.
- In Maryland and [Pennsylvania](#), vehicles in a platoon must be capable of exchanging information about the speed, location and heading between all other vehicles in the platoon.

- [Michigan](#) discussed sensors in the working group on AV rules, but nothing has been codified.

3.6. Distance Gap

Most states rely on rules requiring a “reasonable and prudent” distance between vehicles. Some states explicitly allow platooning vehicles to be exempt from distance gap requirements.

- In [California](#), motor vehicles cannot travel closer than 300 feet to the rear of any other vehicles. CMVs can travel under a 100 feet distance only as part of platoon testing, or with an encroachment permit. The third CA PATH [report](#) on platooning was due by April 1, 2023, which would serve to help update the regulations. It has not yet been published.
- In [Delaware](#), vehicles must stay at least 300 feet apart with cut-ins allowed.
- In [Florida](#), it is unlawful to follow within 300 feet of another motor truck.
- In [Maine](#), a truck operator may not follow within 150 feet of another truck.
- In [Missouri](#), trucks may not follow within 300 feet.
- In [New Jersey](#), trucks may not follow within 100 feet.

In [Illinois](#), normal rules prevail although there is some uncertainty. Previous efforts to clarify the “reasonable and prudent” approach to explicitly allow platooning did not pass.

3.7. Driver Monitoring System Requirements

No specific requirements around driver monitoring systems were identified.

3.8. Driver in Each Truck

There are 15 states that require a human driver to be in control of each vehicle in a platoon or convoy. Perversely, many of these states do not require a human driver in a SAE L4 driverless truck.

- In [Arkansas](#), each vehicle's steering control, systems monitoring and intervention must be in the control of *its* human operator.
- In [Connecticut](#), the operator must be “seated in the driver’s seat.”
- In the [District of Columbia](#), only testing is allowed, and the vehicle must have either a test operator in the vehicle or a remote operator. It is debatable whether this would cover the driver in the lead vehicle.
- In Florida, autonomous trucks can [operate](#) without a human driver present, but [platooning](#) trucks require a driver in each vehicle.
- In [Hawaii and Vermont](#), AVs must be *tested* with a human driver. It is unclear if this would also cover deployments.

- In [Indiana](#), if the [platoon](#) includes commercial motor vehicles, an appropriately endorsed driver who holds a valid commercial driver license (CDL) must be present behind the wheel of each vehicle.
- In [Kentucky](#), an appropriately endorsed driver who holds a valid commercial driver's license shall be present behind the wheel of each commercial motor vehicle in a platoon.
- In [Maryland](#) while the language is ambiguous, the State interprets the regulations to prohibit an autonomous follower.
- In [Michigan](#) the language states that "if the platoon includes a commercial motor vehicle, an appropriately endorsed driver who holds a valid commercial driver license shall be present behind the wheel of each commercial motor vehicle in the platoon."
- [Minnesota](#) requires that "each vehicle in the vehicle platoon must have a human driver present and in the driver seat who is monitoring performance of the vehicle at all times and who holds a valid driver's license for the type or class of vehicle being driven."
- [New Mexico](#) defines "driver-assisted platoon" as a series of motor vehicles platooning with a driver in each vehicle.
- [New York](#) has regulations for testing only, but these provisions state a "person holding a valid driver license must be in the driver's seat while a vehicle is operated on public highways. That person must be prepared to take control when required to in order to operate the vehicle safely and lawfully."
- [Tennessee](#) states that "If the platoon includes a commercial motor vehicle, an appropriately endorsed driver who holds a valid commercial driver license must be present behind the wheel of each commercial motor vehicle in the platoon."
- In [Illinois](#), human drivers are not required for autonomous trucks, however, a human driver is required in the second vehicle "for the testing program's duration."

3.9. Driver Training Requirements

While most states require a "proper license" for the vehicle class, there are a few exceptions; most notably California and Pennsylvania. The list below includes requirements for ADS "test operators" as well as platoon operators.

- In [California](#), for light duty AVs, companies must provide the state information about the driver training program, records indicating a driver has completed the relevant driver training program, and an assessment of the program showing how it achieves safe operations. This program includes:

- Instruction on the ADS technology for the vehicle, including “behind the wheel” instruction provided by an experienced driver on the capabilities and limitations of the system,
- Defensive driver training, including practical experience in recovering from hazardous driving scenarios
- Instruction that matches the level of the experience of the driver in the specific type of ADS technology based on the technical maturity of the system.
- In [Connecticut](#), [Vermont](#) and [Washington](#), drivers must be trained on the capabilities and limitations of the ADS system. In [DC](#), companies must have a test operator training program that meets requirements set by DC.
- In [Maryland](#), drivers must have a CDL and have completed practical training, particularly for the platooning aspects of our operations. Companies must submit the driver training plan as part of the overall operational plan to Maryland. This includes “a brief description of the Driver Training Plan for the Platoon Operator’s specific platooning system, and confirmation of it covering how the platooning system works; understanding of platooning operations, communications, and visual indicators; platooning disengagement and fallback; driver engagement and distracted driving avoidance; and appropriate safety measures.”
- In [Pennsylvania](#),
 - ADS testers should have appropriate training programs and should be able to provide:
 - A description of safety driver training program that includes a description of:
 - (1) How the tester informs HAV safety drivers of any relevant HAV related operational issues, including, but not limited to, any operational limitations of the ADS and the safe operating parameter(s) for the given ODD for the conditions under which the HAV is tested on trafficways, including, but not limited to: (a) Safety driver knowledge of HAV operations (b) Safety driver’s decision making process when driver manually disengages ADS system (c) Safety driver’s knowledge of functionality and/or limitations of safety features originally equipped by the OEM.
 - (2) Measures to prevent driver fatigue/inattentiveness/carelessness, including but not limited to: (a) Distracted Driving avoidance techniques (b) Fatigue and Wellness Awareness (c) Drug and Alcohol Impairment Awareness. This includes both prescribed and unprescribed controlled substances.

- (3) A description of the safety measures in place in case of an ADS disengagement, regardless of the reason for the disengagement.
- (4) A description of the tester's driver training program and how that program addresses:
 - (a) Confirmation of Basic Driving Skills including, but not limited to, (i) Basic Vehicle Operation (ii) Visual Search (iii) Night Operations, if applicable (iv) Hazard Perception (v) Responses to Vehicle Malfunctions (vi) Responses to Sudden Emergencies (vii) Responses to Driving Distractions (viii) Responses to an Aggressive Driver (ix) Responses to Adverse Weather Conditions (x) Post-Crash Procedures (xi) Interactions with Vulnerable Highway Users
 - (b) Basic knowledge of Vehicle Controls/Instruments/Safety Components
 - (c) Basic Trip Procedures, including, but not limited to: (i) Pre-trip Inspection Outside the Vehicle (ii) Pre-trip Preparation Inside the Vehicle (iii) Trip Planning (iv) Post-trip Procedure
 - (d) Divided visual and mental attention tasks particular to the operation of HAV.
- NOTE: if a company provides PennDOT with their VSSA, these requirements are considered satisfied.
- For platooning the Platoon Operator shall provide a description of their driver training program. The training program should consist of:
 - I. How the platooning system works;
 - II. Platoon operations, including communication and visual indicators, and platooning system disengagement and fallback;
 - III. Training on the safety measures that are in place in case of any disengagement, regardless of the reason for disengagement;
 - IV. Driver engagement, including distracted driving avoidance, fatigue and wellness awareness, and drug and alcohol impairment awareness; and
 - V. Continuing education requirement.

3.10. Engine Braking, or Compression-release ("Jake") Braking Prohibitions

[Compression-release \("Jake"\)](#) braking, a form of engine braking used almost exclusively on diesel engines, produces extreme amounts of noise pollution if there is no muffler on the intake manifold of the engine. The sound is similar to a jackhammer but with 10 to 20 times the sound pressure level (10 to 13 dB

greater). Numerous cities, municipalities, states, and provinces have banned the use of unmuffled compression brakes, which are typically only legal in roads away from populations.

- In states like [Oregon](#), [Kansas](#), [Indiana](#) and [Montana](#) vehicles can't use an unmuffled engine brake.
- Likewise, in [Illinois](#) drivers can't operate any engine braking system that emits excessive noise, such as engine brakes without appropriate mufflers.

Anecdotally, the only place many drivers have seen engine brake restrictions have been in towns, not on highways. Therefore, even if we do not see prohibitions on a state-level, companies will want to check specific routes.

3.11. Geography Limitations

Most states have standard rules for driving on mountain passes or steep hills, but nothing specified for platooning or ADS disengagements.

- In [Alaska](#) and [Missouri](#), there is no passing on or stopping at the bottom of hills. [Virginia](#) doesn't allow passing on hills. In [Kansas](#), [Oklahoma](#), [Rhode Island](#) and [Wisconsin](#) drivers must reduce speed on hills. In [Texas](#), drivers must decrease speed on the hill crest. In [Iowa](#), there is no U-turning near hills.
- In [Arizona](#), [Georgia](#), [Hawaii](#), [Nevada](#), and [South Carolina](#) drivers must hold the vehicle as near the right-hand edge of the roadway as reasonably possible while driving highways in canyons or mountains. In [Tennessee](#) and [West Virginia](#) drivers must hold as near to the right hand edge as possible and use their horn if the view upon the curve is unclear. In [Colorado](#), trucks must travel in the right lane only on steep grades.
- [California](#), [Kentucky](#), [Louisiana](#), [North Carolina](#), do not have any prohibitions but do provide tips for mountain driving.
- In [Connecticut](#), there is guidance around keeping vehicles at least three seconds apart, especially around hills, slippery roads, low visibility conditions and others.
- In [Idaho](#), there may be requirements for trucks to use chains on certain passes and certain dates which can be found in [Idaho Code, section 49-948](#). In [Montana](#), "studded tires" are permitted on certain roads for most of the year. In [Oregon](#), trucks need chains for some of I-5s severe mountain passes. [Utah](#) also has snow tire and chain requirements in certain areas and times. In [Washington](#), trucks must carry tire chains from Nov 1 - Apr 1. [Wyoming's](#) chain laws are dependent on the severity of the weather.
- Ohio calls for 300 feet between vehicles on hills.

3.12. Hazardous Grade Speed Limits

[Pennsylvania](#) has a requirement for disengagement of platooning systems in hazardous grade limit zones, but no other state even mentions having a hazardous grade speed limit.

3.13. External Markings

3.13.1. Hazard Light Restrictions

States have not proactively structured requirements around hazard light to permit them to be used for external communication for autonomous trucks and convoys.

Some states describe hazard lights as additional lights that can be placed on the vehicle, while others tailor their rules around indicator lights on a vehicle. Some have requirements that the light colors be between amber and white (and sometimes yellow) and/or restrictions against blue, green and red lighting.

Examples include:

- In [Missouri](#) and [Tennessee](#), flashing signals are prohibited.
- In [Connecticut](#), hazard lights can be used if the vehicle is unable to go at least 40mph. In [Virginia](#), “all four turn signals shall not be flashed simultaneously while the vehicle is traveling faster than thirty miles per hour.” In [Colorado](#), the rules allow hazard lights only when the vehicle is going under 25 mph.
- [Alabama](#), [Arkansas](#), [Delaware](#), [Illinois](#), [Indiana](#), [Kentucky](#), [Ohio](#) and [Texas](#) allow for hazard lights in “the presence of a vehicular traffic hazard requiring unusual care in approaching, overtaking, or passing.”
- [Pennsylvania](#) allows the use of the front and rear signal lamps to indicate a vehicular traffic hazard. However, vehicles must use the signals when the vehicle is stopped or disabled on a highway, except when the vehicle is stopped in compliance with a traffic-control device or when legally parked. Drivers of other vehicles shall exercise extraordinary care in approaching, overtaking and passing a vehicle displaying vehicular hazard warning signals.
- In [California](#), flashing lights may only be used to indicate an unusual traffic hazard, but this is intended to be infrequently used.

3.13.2. Blue Light Restrictions

In at least 22 states, there are restrictions on the use of blue lights, often because of concerns that people may confuse vehicles with these lights for emergency or law enforcement vehicles. In [Florida](#), for example, the language just prohibits “red or blue” light (not including brake lights) without detailing specifically what this means.

Companies have considered using the SAE J3134 recommended “blue-green” lighting to indicate autonomy but individual companies have gotten feedback that the color is too similar to colors in use by some State departments. Additionally, some states have specific color restrictions, detailed below.

We did not find any State barriers to the use of the color purple to indicate autonomy, however [NHTSA has previously indicated](#) that purple would be inappropriate. There does not seem to be an agreed upon color for indicating autonomy at this time.

3.13.3. Specific Color Restrictions

- In [Arkansas](#), no blue, red or green shall be visible from directly in front of the vehicle. In [Maine](#), green is reserved for some oversized loads. No red or green light can be visible from the front in [Nebraska](#). In [Oregon](#), green light is intended only for use on emergency vehicles.
- States that require the color to be between amber and white include [Arizona](#), [Delaware](#), [Indiana](#), [Kentucky](#), [Texas](#)
- In [Alaska](#), additional hazard lights must be between yellow and white.

3.13.4. Visual Identifier / External Markings for Platoons

- [Indiana](#) (likely), [Kentucky](#), [Maryland](#), [Pennsylvania](#), [Tennessee](#) and [West Virginia](#) require specific platooning stickers. Other states require standard Federal markings, unless hauling hazardous materials.

3.14. Highways and Interstates Only / Types of Roads Allowed

If a State does have rules for ADS or platooning operations, they typically confine them to “highways,” “public roads,” “limited access highways/ roads” or “interstate(s).” Some also request that companies let them know where they intend to test or deploy.

- In [California](#), platooning “testing” operations must have their routes approved. ADS CMVs are not authorized until permissive regulations are passed.
- [Connecticut](#) bans testing on limited access highways. This rule is from 2017, so it may only be considering light-duty AVs.
- [Louisiana](#) prohibits platooning on a 2-lane highway.
- States that allow testing on highways only: [Florida](#), [Iowa](#), [Kentucky](#) (platooning), [Nevada](#), [New York](#) (with approval), [Oregon](#), [Pennsylvania](#) (with approval), [Utah](#), [Vermont](#).
- [South Dakota](#) allows operations on the interstate only.

- [West Virginia](#) allows for operations on limited access highways or interstates.
- In [Maryland](#), operations are limited to only specific controlled access highways, although the state has indicated they would approve relevant and appropriate routes.
- In [Minnesota](#), operations are limited to freeways and expressways.

3.15. Insurance Requirements

Some states specify that an automated commercial vehicle be covered by motor vehicle liability coverage. For most states, the coverage per vehicle varies between \$1 million to \$5 million, although Michigan has a \$10 million minimum. Some states have no specific amount, but do specify that the vehicle be covered.

- States with no identified requirements: Alaska, Colorado, Delaware, Idaho, Illinois, Kansas, Kentucky, Massachusetts, Mississippi, Missouri, Montana, Nebraska, New Mexico, Oklahoma, Rhode Island, South Carolina, Tennessee, Wisconsin and Wyoming. [Oregon currently has none but](#) is considering changes.
- States that require the same amount as for conventional vehicles: [Georgia](#), [Indiana](#), [New Jersey](#), [Texas](#), [Virginia](#) and [West Virginia](#).
- States that require an appropriate amount (which isn't specified): [Arizona](#), [Arkansas](#), [District of Columbia](#), [Iowa](#), [Minnesota](#), [Ohio](#), [South Dakota](#), [Utah](#).
- States requiring at least \$2 million in coverage per vehicle include: [Alabama](#) and [Louisiana](#).
- States requiring at least \$5 million in coverage per vehicle include [California](#) (for light duty vehicles), [Connecticut](#), [Florida](#), [Hawaii](#) (likely), [Nevada](#), [New Hampshire](#), and [New York](#).
- [Maryland](#) requires minimal levels according to the [Federal](#) minimum levels of financial responsibility for motor carriers.
- [Michigan](#) requires at least \$10M per vehicle.

3.16. Lane Boundary Markings

No State requirements for specific or unique rules regarding lane markings for ADS were identified. In general lane boundary markings must follow the Federal Manual on Uniform Traffic Control Devices for Streets and Highways.

3.17. Tractor / Trailer Lighting Limitations

For this review, we looked for general CMV rules about lighting requirements. For some states, the specific lighting requirements included were for either a tractor or trailer. For others, specifics are outlined for farm tractors.

- In [Alaska](#), truck tractors also need two cab clearance lights, yellow, one each side.
- In [Arizona](#), a trailer must have one clearance lamp on each side, side reflector lamps, reflectors, and stoplight.
- In [Arkansas](#), [Colorado](#), [Indiana](#) and [Maine](#), a trailer must have one tail lamp with red light visible from 500 ft.
- [DC](#) specifies that a truck tractor have two front clearance lamps, one rear Trailer: two front clearance lamps, two side lamps, two rear clearance lamps
- In [Michigan](#), trailers need one working tail light, and two red rear reflectors.
- [Minnesota](#) requires that a trailer must have a headlamp with red light for 500 feet and reflectors 20-60 inches from the ground
- [Mississippi](#) prohibits red lighting except on the rear of a truck, trailer or tractor.

3.18. Load Types Prohibited

For this category, we looked for specific load type restrictions for autonomous trucks or for trucks that are platooning. Only Pennsylvania and Maryland have specific prohibitions for platooning (hazardous materials, loose materials, lumber, etc.). Other states only mention hazardous materials for general CMVs and endorsement processes.

- [Hawaii](#) has special rules for transporting drinking water.
- [Georgia](#) is a good example of standard rules for flammable and combustible liquids.
- [Louisiana](#) has certain knowledge tests for different load types.
- [Maryland](#), has a prohibition on platooning trucks from transporting hazardous or loose materials.
- [Pennsylvania](#) doesn't allow platooning vehicles to carry hazardous materials, overweight loads, livestock, fluids, pipes, lumber and more.

3.19. Maximum Speed

The standard range for trucks is from 65-75 miles per hour (mph) for interstates and 55-65 mph for other highways. A number of states in the Northwest allow for up to 80 mph. The slowest maximum speed is 55 mph in [Oregon](#), 60 mph in [Washington](#), and even 45 mph on certain routes in [Virginia](#).

- [Alabama](#): 70 mph
- [Alaska](#): 65 mph
- [Arizona](#): 75 mph
- [Arkansas](#): 65 mph, 50 mph for trucks in other locations
- [California](#): 65 mph for most, 55 or 70 for others and 55 for trucks.

- [Colorado](#): 75 mph, except for narrow/ winding curves
- [Connecticut](#): 65 mph
- [Delaware](#): 65 interstate, 55 mph others
- [DC](#): 55 mph highways, 20 mph as designated
- [Florida](#): 70 mph interstates
- [Georgia](#): 70 mph
- [Hawaii](#): 65 mph
- [Idaho](#): 70 mph for trucks
- [Illinois](#): 70 mph
- [Indiana](#): 65 mph for trucks
- [Iowa](#): 70 mph
- [Kansas](#): 75 mph
- [Kentucky](#): 65 mph interstate
- [Louisiana](#): 75 mph rural highways, 60 mph interstate
- [Maine](#): 70 mph
- [Maryland](#): 70 mph interstate, 55 mph otherwise
- [Mass](#): 65 mph interstate, 50 mph outside business district
- [Michigan](#): 60 mph for trucks over 10,000 lbs.
- [Minnesota](#): 65 mph urban interstate, 70 mph rural interstate, 65 mph expressways
- [Mississippi](#): 65 mph
- [Missouri](#): 70 mph
- [Montana](#): 65 mph on federal interstate; 60 mph other public highways
- [Nebraska](#): 70 mph
- [Nevada](#): 75 mph
- [New Hampshire](#): 70 mph, rural interstate
- [New Jersey](#): 65 mph
- [New Mexico](#): 75 mph
- [New York](#): 55-65 mph interstate
- [North Carolina](#): 70 mph interstate, others 55mph
- [North Dakota](#): 75 mph interstates
- [Ohio](#): 70 mph for trucks
- [Oklahoma](#): 75 mph, 80 on specified segments
- [Oregon](#): 55 mph for trucks, 60 on [designated](#) interstates
- [Pennsylvania](#): 70 mph, not specified for trucks
- [Rhode Island](#): 65 mph rural highways, 55 mph for all others
- [South Carolina](#): 70 mph
- [South Dakota](#): 80 mph
- [Tennessee](#): 65 mph
- [Texas](#): 70 mph, not specified for trucks. 75-85 on approved highways
- [Utah](#): 70 mph urban 80 mph most others
- [Vermont](#): 65 mph

- [Virginia](#): 45 mph for trucks on routes numbered 600 or higher
- [Washington](#): 60 mph for trucks
- [West Virginia](#): 70 mph
- [Wisconsin](#): 65 mph
- [Wyoming](#): 75 mph, sometimes 80 mph

3.20. Minimum Speed

Most states don't specify a number, they have code that specifies that vehicles can't move so slowly as to be disruptive. Those states that do have specific numbers generally specify a range from 40-45 mph for highways.

- 30 mph: [Mississippi](#)
- 35 mph: [Pennsylvania](#)
- 40 mph: [Connecticut](#), [Kansas](#), [Massachusetts](#) (turnpike), [Minnesota](#), [Missouri](#), [South Dakota](#)
- 45 mph: [Arkansas](#), [Illinois](#), [Maine](#), [Nebraska](#), [New Hampshire](#), [New York](#), [South Carolina](#), [Utah](#)
- 50 mph: [Florida](#)
- 55 mph: [Michigan](#)
- For [North Carolina](#), the rule is 45 mph when max is 60; otherwise 40 mph.
- In [Ohio](#), it is between 30-50 mph.
- In [Tennessee](#), the minimum speed for the left lane is 55 mph.

3.21. Move Over Laws

Nearly all States have enacted [Move Over](#) laws. Generally speaking, trucks of all kinds approaching an emergency response, or any stationary vehicles with flashing lights, should either safely merge into a lane farther away from the response area (as far as reasonably possible) or pass the emergency response area at a speed of no more than 15 or 20 miles per hour less than the posted speed limit and reasonable for safely passing.

Explicit examples: [Pennsylvania](#), [Ohio](#), [Texas](#), [Arkansas](#), [Indiana](#)

3.21.1. Right Lane Only

Almost all States have a standard slow-moving / move over law about using the right lane unless passing. However, as of the publishing of this report, similar laws have not been identified in Pennsylvania, Ohio and Texas.

3.22. No HAVs allowed

Industry partners have worked with AUVSI to create a L4 CMV deployment [map](#). If a state is dark blue, operations are expressly permitted according to state law. If

3.24. No Truck Lanes

For this section, we reviewed language about the existence of no truck lanes or platoon behavior. The rule of thumb is that trucks should stay in the right lane. However, companies should evaluate each route because there may be instances where an autonomous truck or convoy would want to move over to provide greater ease for vehicles entering a route from a right hand entry lane.

- States without identified “no truck lanes”: Hawaii, [Idaho](#), Illinois, [Iowa](#), Kansas, [Louisiana](#), [Maine](#), [Massachusetts](#) (with negligible limitations), [Minnesota](#) (not yet), Mississippi, [Montana](#), [Nebraska](#), [Nevada](#) (some current temporary restrictions), New Hampshire, [New Mexico](#) (for now), [Ohio](#), [Oklahoma](#), [Oregon](#), Rhode Island, [South Carolina](#), South Dakota
 - Link to unofficial but [comprehensive](#) report for the States not specifically hot linked above.
- These states do *not* have specific no truck lanes, but require trucks to travel only in the right lane unless passing: [Alaska](#), [California](#) (unless otherwise indicated by signage), [Colorado](#) (anywhere speed limit is over 65 mph), [Indiana](#), [Kentucky](#), [Tennessee](#), [West Virginia](#)
- These states do not allow trucks to use the left lane if there are over three lanes: [Arkansas](#), [Florida](#), [Georgia](#), [Michigan](#), [New Jersey](#), [North Carolina](#), [Utah](#)
- These states have limitations on certain routes: [Alabama](#), [Connecticut](#), [DC](#), [Maryland](#), [Missouri](#), [New York](#), [Texas](#), [Vermont](#), [Virginia](#), [Washington](#)
- [Pennsylvania](#) has no truck lanes, on which they also currently prohibit platooning.
- In [Arizona](#), they delegate the question to the local authorities
- [North Dakota](#) and [Wisconsin](#) have lanes with weight restrictions

3.25. Other Platooning or Uniform Truck Travel Regulations

This section focuses on unique rules that apply only to platooning vehicles. Most states that have platooning legislation beyond basic follow-too-closely exemptions have requirements that companies submit a platooning plan.

- These states include: [Arkansas](#), [Florida](#), [Kentucky](#), [Maryland](#) (and drivers must have a copy of the approval with them), [Michigan](#), [Minnesota](#), [Mississippi](#), [North Dakota](#), [Pennsylvania](#), [South Dakota](#), and [West Virginia](#).
- In [New York](#), companies must have a law enforcement interaction plan.

NOTE: this list does not include those for which companies need to submit an automated vehicle plan. (See: Reporting Requirements)

3.26. Oversize / Overweight loads

For this section, we reviewed what is considered oversize and requires a permit in the state. In general, if a truck is greater than these metrics we should check to see if it is oversize (example: [Virginia](#)):

- Length: 40 feet excluding load, 48 feet with load
- Width: 8'6"
- Height: 13'6"
- Weight: Gross Vehicle Weight of 80,000 lbs. or 20,000 lbs. on an axle

In states like [Pennsylvania](#), platoons are prohibited from hauling oversize/overweight loads.

3.27. Rest Stop / Safety Rest Area Parking

Generally, the State Highway Patrol has authority over rest stops, with potential exceptions of toll road authorities. There are some [Federal regulations](#), but they mostly cover access and the types of commerce that can take place. Many states have no specific laws, rules or guidance. Generally, companies should not expect to be able to use rest stops for interchanging trailers, but should be able to utilize rest stops provided they do not get in the way of others or block traffic.

- In [Pennsylvania](#), [Missouri](#) and [West Virginia](#), there are no rules that cause concern. States with no specific law or guidance beyond the normal include [Arkansas](#), [Indiana](#) and [Oklahoma](#).
- In [Tennessee](#), there is no overnight parking, and vehicles cannot stay for longer than two hours.
- In places like [Ohio](#), rules prohibit things like parking on the grass; parking of commercial vehicles for interchanging, unloading, etc., is prohibited; and drivers can't leave equipment for more than a given period of time (three hours, for example).
- [Kentucky](#) explicitly prohibits use as a relay station or transfer point for trailers in transit, and the maximum time a rest area can be used is four hours.
- In [Texas](#), vehicles cannot stay in a rest area for more than 24 hours.

3.28. Roads and Traffic

For this section, we looked for unique rules on roads and traffic for autonomous trucks and convoys, or just unique state laws. Nothing significant was found.

3.29. Seat Belt Use in Autonomous Trucks / Convoys

Initially, the research focused on whether a human driver/supervisor had state level laws that would prevent the driver from getting out of the seat and moving

to the sleeper berth. Upon further review of the Federal Motor Carrier Safety Regulations (FMCSRs), we believe that federal regulations require people to either be in a seat belt or sleeper berth when the vehicle is moving:

[Seat Belts \(392.16\)](#): No driver shall operate unless they are properly restrained by the seat belt assembly. Drivers also shall not operate unless passengers are properly restrained (seat belts or in the sleeper berth).

Regardless, most states have seat belt laws for drivers and passengers (excluding [New Hampshire](#)).

3.30. Shoulder Space

In general, [standard rules](#) apply nationwide (no driving or parking on the shoulder unless it is an emergency).

3.31. Toll Plazas

For this section, we searched for specific language about operations in and around toll plazas. Most states (except Pennsylvania) do not have specific rules for operations in and around toll plazas, and the majority that do just note reduced speed limits.

- [Pennsylvania](#) guidance prohibits platooning in toll plazas, but any other states that mention them only specify a reduced speed (for all motor vehicles).
- [Connecticut](#) considers them a “trouble spot” because of the number of lanes changing.
- In [Idaho](#), they flag that there are specific traffic signals for toll plazas.
- In [Maine](#), they have reduced speed zones starting 75ft in front of the plaza.
- There are reduced speeds in [New Hampshire](#) (also no reversing), [New Jersey](#), [Oklahoma](#), [Virginia](#), and [West Virginia](#).

3.32. Traffic

We searched for any rules that could limit where platoons or automated vehicles can operate (i.e. “no heavy traffic”). For the most part, nothing notable was found. Some exceptions include:

- In [Maryland](#), where the platooning plan must include information on traffic conditions and roadway types the platoon is intending to operate in.
- In [Pennsylvania](#), current guidance states that platoons must disengage when necessary to allow reasonable access for vehicles to enter or exit the

highway, among other reasons. Companies must also submit the following information to the state:

- i. Identify order of lead and non-lead vehicles
- ii. Provider of the Driver-Assistive Vehicle Platooning technology
- iii. Planned Operational Design Domain (ODD) for the platooning including:
 - a. Trafficway types on which the Driver-Assistive Vehicle Platooning system is intended to operate safely;
 - b. Geographic constraints, if applicable;
 - c. Speed constraints, if applicable;
 - d. Environmental conditions (weather, daytime/nighttime, etc.), if applicable;
 - e. Traffic conditions, if applicable;
 - f. Allowances and process to allow vehicles to merge into a platoon, if applicable; and
 - g. Other domain constraints that may affect the safe operations of the platoon.
- iv. Platooning formation method
- v. Headway/following distance between vehicles
- vi. Describe how the platoon disengages
- vii. Describe platoon fallback

3.33. Tunnels

[Pennsylvania](#) does not allow platooning in tunnels. Prohibitions common enough to consider standard include:

- Prohibitions on certain hazardous materials,
- No parking,
- No passing (inside or within view of a tunnel), or
- No stopping within a certain distance (generally 300 feet) of a tunnel.

3.34. Unified Carrier Registration (UCR) Agreement

Motor carriers involved in interstate commerce, and other businesses subject to [Unified Carrier Registration](#) (UCR) are required to submit annual fees based on fleet size to supplement funding for state highway motor carrier registration and safety programs.

The Unified Carrier Registration program is unusual. It is essentially a State revenue program, but it is established under Federal law. The fees charged under the UCR program are uniform across all the participating States and are set by the U.S. Secretary of Transportation upon the recommendation of the UCR Board.

Each entity subject to UCR is required to register annually with its base state and to pay an annual fee. The fees imposed on motor carriers and freight forwarders - - businesses that operate motor vehicles – are graduated through a system of brackets, based on the number of vehicles they have operated; brokers and leasing companies, which operate no vehicles themselves, pay a fee at the level that applies to the smallest motor carriers.

The agreement fees can be found [here](#).

3.35. Vehicles and Vehicle Dynamics

For this category, we looked for any specifics about the vehicles or operational design domain for AVs or platoons. Most states that do mention vehicle dynamics require a description of the standard maneuvers and how they achieve minimal risk conditions. In general, automated vehicles should be able to achieve a minimal risk condition in the face of faults and failures.

- In Pennsylvania, the state guidance requires the submission of the following vehicle information:
 - i. Makes/Models
 - ii. VIN of the vehicles
 - iii. Vehicle license plate number and jurisdiction of issue USDOT numbers for vehicles
 - iv. PUC numbers, if applicable
 - v. Number of vehicles in the platoon (2 or 3)
 - vi. Anticipated weight of each vehicle (including any trailers and cargo)
 - vii. Load/trailer types (e.g., singles or tandem), if applicable
 - viii. Brief description of planned cargo including:
 - a. Hazardous materials (yes or no)
 - b. Livestock (yes or no)
 - ix. Oversize/overweight/overheight loads (yes/no)
 - x. Vehicle(s) carrying fluids (yes/no)
 - xi. Vehicle(s) carrying pipes, lumber, or similar types of loose loads (yes/no)
 - xii. Brake types of each vehicle (e.g., disc or drum)
 - xiii. Identify lead and non-lead vehicle(s)
 - a. Identify if the lead and non-lead vehicle(s) alternate during operation
- In [Maryland](#), companies must submit the platoon’s dynamic capabilities.

3.36. Weather / Accumulated Precipitation / Precipitation

Similar to the other ODD constraints categories, [Pennsylvania](#) does not allow platooning in adverse weather. Other states just have reduced speed laws or general advisory tips based on weather severity. Notable laws include:

- In [Mississippi](#), drivers must reduce your speed to 45 mph in inclement weather.
- In [North Carolina](#) and [18 other states](#), drivers must turn on headlights when their windshield wipers are engaged.
- In [South Dakota](#), a platooning permit is not valid when the road is slippery.

3.37. Weigh Stations

Weigh stations are regulated by individual State governments. Their primary function is enforcement of tax and safety regulations, including checking freight carrier compliance with fuel tax laws; weight restrictions; equipment safety; and compliance with hours of service regulations.

In general [any vehicle over 10,000lbs must stop](#) at every weigh station. There are also unique rules for each weight station depending on location and layout. "Trucks may be assessed by axle, or the entire vehicle may be measured. Some weigh stations have rolling scales, which allow the truck to remain in motion while being weighed, which can cut down on time spent at the weigh station and get the driver back on his route quickly. Other stations will require the truck to be completely stopped when being weighed." ([Source](#))

According to [FMCSA](#), virtual weigh station concepts are "very flexible" and "states can customize their Virtual Weigh Station deployments to meet their specific functional needs."

PrePass, [Drivewyze](#) and other options are enabled in 48 states. The largest, Drivewyze, is [available](#) in 45 states. Even using a bypass device, trucks may still be required to pull into weigh stations at times. So, autonomous truck and convoy companies must be able to follow basic protocols for weighing and inspections.

3.38. Work Zones

Most states have enhanced fines for speeding, distracted driving, tailgating and aggressive driving in work zones. It would appear a common required practice would be turning on headlights in all work zones, but the use of 4-way emergency flashers is not allowed in some states, and so should not become part of a routine protocol.

- In [California](#) and [Missouri](#), they recommend using 4-way emergency flashers to warn drivers coming from behind that a work zone is approaching.
- [Delaware](#) banned semi-trucks from the I-95 work zone in 2021.
- [Maryland](#), [Pennsylvania](#) and [South Dakota](#) do not allow platooning in work zones.
- In [Michigan](#), drivers are prohibited from passing or going over 45mph in a work zone.
- In [New Jersey](#), drivers must turn on their headlights in a work zone.