

10 BEST PRACTICES FOR STATE AUTOMATED VEHICLE POLICY

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CONTENTS

- Defining Automated Vehicles
- Existing State Automated Vehicle Policies
- Recommendations for State Policymakers



DEFINING AUTOMATED VEHICLES



Driving Automation Systems and Automated Driving Systems

FIGURE 1: SAE J3016 LEVELS OF DRIVING AUTOMATION

	SAE LEVEL 0	SAE LEVEL 1	SAE LEVEL 2	SAE LEVEL 3	SAE LEVEL 4	SAE LEVEL 5
What does the human in the driver's seat have to do?	You <u>are</u> driving whenever these driver support features are engaged – even if your feet are off the pedals and you are not steering			You <u>are not</u> driving when these automated driving features are engaged – even if you are seated in “the driver’s seat”		
	You must constantly supervise these support features; you must steer, brake or accelerate as needed to maintain safety			When the feature requests, you must drive	These automated driving features will not require you to take over driving	
	These are driver support features			These are automated driving features		
What do these features do?	These features are limited to providing warnings and momentary assistance	These features provide steering OR brake/acceleration support to the driver	These features provide steering AND brake/acceleration support to the driver	These features can drive the vehicle under limited conditions and will not operate unless all required conditions are met		This feature can drive the vehicle under all conditions
Example Features	<ul style="list-style-type: none"> • automatic emergency braking • blind spot warning • lane departure warning 	<ul style="list-style-type: none"> • lane centering OR • adaptive cruise control 	<ul style="list-style-type: none"> • lane centering AND • adaptive cruise control at the same time 	<ul style="list-style-type: none"> • traffic jam chauffeur 	<ul style="list-style-type: none"> • local driverless taxi • pedals/steering wheel may or may not be installed 	<ul style="list-style-type: none"> • same as level 4, but feature can drive everywhere in all conditions

Source: SAE International



Present and Possible Future Use Cases

TABLE 1: DRIVING AUTOMATION SYSTEM USE CASE EXAMPLES

SAE Level	Example Use Cases
1	Adaptive cruise control*, lane centering*, platooning (speed/brake coordination only)†
2	Tesla Autopilot*, hands-free traffic jam assistance*, platooning with lane centering
3	Highway pilot
4	Urban taxicab†, last-mile urban delivery†, fixed-route transit†, long-haul freight
5	Utility vehicles

Notes: * presently available to consumers

† presently in limited public pilot project operation



EXISTING STATE AUTOMATED VEHICLE POLICIES



Legislation

TABLE 2: ENACTED STATE AUTOMATED VEHICLE LEGISLATION BY TYPE, 2017-2020

Legislation Type	Number of States with Enacted Legislation
Commercial	22
Cybersecurity of Vehicle	0
Definitions	22
Infrastructure and Connected Vehicles	5
Insurance and Liability	8
Licensing and Registration	3
Operation on Public Roads	14
Operator Requirements	11
Other	8
Privacy of Collected Vehicle Data	1
Request for Study	7
Vehicle Inspection Requirements	0
Vehicle Testing	11

Source: National Conference of State Legislatures' Autonomous Vehicles State Bill Tracking Database

TABLE 3: ENACTED STATE AUTOMATED VEHICLE LEGISLATION EXAMPLES

State	Bill Number (Year)	Summary
Alabama	SJR 81 (2016)	Creates automated vehicle legislative study committee
California	SB 1298 (2012)	Creates a comprehensive automated vehicle regulatory framework
California	AB 1184 (2018)	Authorizes San Francisco, subject to voter approval, to enact a fare tax of up to 3.25% on automated vehicle taxi trips originating in the county
Colorado	SB 213 (2017)	Defines and explicitly authorizes automated vehicle operations
Florida	HB 1207 (2012)	Defines "autonomous technology," recognizes legality of automated vehicle operations
Florida	HB 311 (2019)	Replaces earlier "autonomous technology" definitions with SAE J3016 definitions, integrates automated ride-hailing with existing ride-hailing framework, establishes automated vehicle insurance requirements, preempts localities from discriminating against automated driving systems
Georgia	HB 472 (2017)	Exempts platoon following vehicles from following-too-closely requirements
Illinois	HB 791 (2017)	Preempts localities from prohibiting automated driving systems
Nevada	AB 511 (2011)	Creates automated vehicle driver's license endorsement
Oklahoma	SB 365 (2019)	Preempts localities from legislating or regulating the use of driving automation systems in a manner different than non-automated vehicles
Texas	SB 2205 (2017)	Defines automated driving system, preempts local regulation of automated driving systems and vehicles equipped with ADS, explicitly authorizes automated vehicles
Virginia	HB 454 (2016)	Exempts operators of automated vehicles from the general prohibition against visible displays being visible to vehicle operators
Washington, D.C.*	DC B 19-0931 (2012)	Defines "autonomous vehicle," requires manual handoff, prohibits aftermarket automation of vehicles manufactured more than four years prior to conversion

*While a federal district and not a state, Washington, D.C. acts as a state in most contexts under the federal District of Columbia Home Rule Act of 1973.



Regulation

- Even in states that have enacted AV legislation, most do not impose complex regulatory regimes
 - California imposes detailed permitting and reporting regulations
 - Florida does not, instead largely relying on an insurance requirement to “regulate” AVs through private mechanisms
- California is still the top state for AV developer HQs, but advanced testing and operations have shifted to states with lower regulatory burdens (e.g., Arizona, Texas)



Executive Orders

TABLE 4: STATE EXECUTIVE ORDERS RELATED TO AUTOMATED VEHICLES

State	E.O. Number (Date)	Summary
Arizona	2015-09 (Aug. 25, 2015)	State agencies should coordinate on testing and operation of automated vehicles on public roads
Arizona	2018-04 (March 1, 2018)	Requires automated vehicles to be in compliance with federal and state safety regulations
Arizona	2018-09 (Oct. 11, 2018)	Establishes the Institute of Automated Mobility
Delaware	14 (Sep. 5, 2017)	Establishes the Advisory Council on Connected and Autonomous Vehicles
Hawaii	17-07 (Nov. 22, 2017)	Establishes automated and connected vehicle policy point of contact within the governor's office and orders state agencies to facilitate testing
Idaho	2018-01 (Jan. 2, 2018)	Establishes the Autonomous and Connected Vehicle Testing and Deployment Committee to examine policy best practices as well as barriers to testing and deployment
Illinois	2018-13 (Oct. 25, 2018)	Establishes automated vehicle testing program within the Illinois Department of Transportation
Maine	2018-001 (Jan. 17, 2018)	Establishes the Maine Highly Automated Vehicles Advisory Committee
Massachusetts	572 (Oct. 20, 2016)	Establishes a working group to develop automated vehicle policy recommendations
Minnesota	18-04 (March 6, 2018)	Establishes the Governor's Advisory Council on Connected and Automated Vehicles
Ohio	2018-01K (Jan. 18, 2018)	Establishes DriveOhio policy center
Ohio	2018-04K (March 9, 2018)	Establishes automated vehicle testing and pilot programs and requires registration with DriveOhio
Washington	17-02 (June 7, 2017)	Establishes interagency working group to develop automated vehicle pilot programs throughout the state
Wisconsin	245 (May 18, 2017)	Establishes the Governor's Steering Committee on Autonomous and Connected Vehicle Testing and Deployment



RECOMMENDATIONS FOR STATE POLICYMAKERS



I) Adopt a Standard Vocabulary

- For better or worse, SAE International's Recommended Practice J3016 has become the dominant consensus standard for defining levels of driving automation
- If states pursue AV policy, they should adopt J3016 rather than crafting their own government-unique definitions



2) Recognize the Legality of Automated Vehicles

- This would be a simple finding of the legislature
- E.g., Florida's 2012 law included a provision that “finds that the state does not prohibit or specifically regulate the testing or operation of autonomous technology in motor vehicles on public roads”
- This statement is (or was) true in virtually every state
- This wouldn't answer most long-term AV policy questions, but it would send a signal to developers that the state is “open for business”

3) Respect Competencies at Various Levels of Government



- Federal, state, and local governments all possess specific areas of expertise in the broader landscape of motor vehicle regulation
- The federal government focuses on safety and performance requirements administered by NHTSA and FMCSA, as well as funding and coordinating road infrastructure investments through programs administered by FHWA
- State authorities have expertise in constructing and managing infrastructure, as well as driver licensing, vehicle registration, traffic operations, insurance, and liability determination
- Municipal and county authority expertise overlaps with that of state authorities in constructing and managing infrastructure, and traffic management and enforcement
- No reason to reinvent the wheel: agencies at various levels of government should stay in their policy wheelhouses



4) Audit Motor Vehicle Codes for Existing Barriers

- Existing requirements that may pose barriers to AVs:
 - Driver duties upon striking unattended vehicles
 - Prohibitions on following-too-closely
 - Horn switches must be readily accessible to the operator
 - Inspection requirements related to steering wheels and brake pedals
 - Rearview mirrors
 - Mufflers
 - Safety belts
 - Operational speedometers
 - Steering mechanisms
 - Windshields
 - Windshield wipers
- Once conflicts are identified, lawmakers and regulators can resolve them by explicitly exempting automated vehicles from these provisions



5) Distinguish Between Vehicle Types

- Low-speed, low-mass, geographically restricted passenger shuttles and last-mile delivery vehicles equipped with ADS should not be held to the same standards as ADS-equipped highway vehicles
- The federal government and many states have traditionally made distinctions between low-speed vehicles and highway vehicles
- As new novel vehicle types are developed to serve various automated vehicle business models, policymakers should allow maximum flexibility if these vehicles are able to meet an equivalent level of safety as conventional vehicles operating under the same operational design domains

6) Remain Neutral on Future Business Models



- Example: ULC’s Uniform Automated Operation of Vehicles Act
 - Appears to have unintentionally restricted “automated driving providers” to developers
 - Problem: the most experienced vehicle fleet managers are rental car companies, which do not have experience/interest in AV development but would love the opportunity to manage AV fleets
 - To date, only Washington State has considered—but not enacted—the Uniform Automated Operation of Vehicles Act



7) Avoid Questionable Legal Frameworks

- Be wary of misuse of executive orders and guidance documents
 - Example: Arizona and Ohio appear to use executive orders to bind private parties on AV matters
 - Another example: PennDOT issued supposedly nonbinding guidance that imposes a number of requirements on testing firms
 - Rather than bypass “hard law,” it appears this claimed “soft law” approach merely imposes “hard law” conditions without the requisite procedural protections and accountability that comes from conventional legislation and regulation
- These approaches increase litigation risk for states and may deter developer interest in states using such questionable legal frameworks



8) Focus on Infrastructure State of Good Repair

- AVs and CVs are different
- CV technology is in the middle of a major disruption (DSRC vs. C-V2X and beyond, FCC vote Nov. 18)
- DOTs should not be placing very risky bets on equipment
- ADS sensors perform best on well-maintained, modern roadways
- Instead of pursuing expensive “smart roads,” state policymakers should fulfill their traditional duties by focusing on the state of good repair of their existing road infrastructure

9) Designate a Lead Automated Vehicle Policy Office



- It would be wise for states to designate a lead automated vehicle policy office to serve as a clearinghouse and coordinating body for the variety of policy decisions that will be made across a number of agencies
- Such an office could exist within the governor's office, state department of transportation, or department of motor vehicles
- This would be an appropriate use of a governor's executive order powers



I 0) Prepare for an Extended Period of Uncertainty

- For automated vehicle policymaking, less can be more
- State policymakers should focus on discrete known problems and avoid codifying their predictions about the direction of these technologies or possible use cases
- As these technologies remain highly proprietary and with development largely taking place in an environment of intense secrecy, it may be difficult to determine how quickly testing and deployment milestones will be met to enable wide-scale deployment of automated vehicles
- State policymakers should adopt a general principle for crafting automated vehicle policies in a manner that respects this uncertainty and allows for flexibility to adapt when new information is available
- Locking in hard rules that seem sensible today may prove unwise in the near future

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