

THE WINSTON BERTANI LAW GROUP
Intellectual Property & Business Attorneys



2413 Sanctuary Drive
Fairfield, California 94534
www.winstonbertanilawgroup.com

Phone: 707-576-7777
Fax: 707-581-6905
pambertani@winstonbertanilawgroup.com

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From: Commissioner Pam Bertani
Chair, Study Committee on State Regulation of Driverless Cars

To: ULC Committee on Scope and Program

RE: Study Committee on State Regulation of Driverless Cars
Final Report And Recommendations

Executive Summary

Significant technological, legislative and policy developments have occurred in the automated driving marketplace since this Study Committee began its work in 2014. At the outset of our Study Committee's work, four States and the District of Columbia had enacted legislation concerning some aspect of state regulations for Automated Vehicles ("AVs"). At that time, the United States Department of Transportation ("USDOT"), through the National Highway Traffic Safety Administration ("NHTSA"), had issued its 2013 guidelines for States attempting to regulate AVs (i.e., driverless cars).

As this patchwork of legislative efforts continued to evolve, it became abundantly clear to the Study Committee that automated vehicle development was not proceeding along the linear pathway contemplated by then existing legislation. Instead, developers were approaching advanced vehicle automation from a variety of paths, many of which presented their own unique regulatory challenges. For instance, Google continued to work on a fully self-driving vehicle that would not be bound by conventional automobile manufacturing (e.g., the Google vehicle would not have a steering wheel, but rather have its steering directed entirely by an on-board computer). Conversely and simultaneously, some automobile manufacturers were approaching vehicle automation with an incremental approach. Rather than attempting to develop fully self-driving vehicles, they continued to automate individual driving functions and combine these functions in order to reduce driver workload under certain conditions. To this end, a number of automobile manufacturers have combined lane following with adaptive cruise control so that a driver on a limited access highway can travel for miles without doing more than monitoring

automated vehicle system operations. In addition, truck manufacturers and others continued to develop platooning systems that allow several unmanned trucks to follow a single manned truck. Other organizations are pursuing other approaches to vehicle automation, such as unmanned shuttles that will operate at low speeds on predetermined routes on college campuses, theme parks, and the like.

Therefore, it is no surprise that the current State-of-the-States regarding automated vehicle legislation is, at best, in a state of disarray. Nine States and the District of Columbia have enacted automated vehicle legislation; two States have Executive Orders in place to address automated vehicles; approximately six States are in the process of adopting automated vehicle legislation and have bills currently under consideration; and more than 15 States have declined to pass automated vehicle legislation.¹ The table set forth below in Section IV highlights various definitional and substantive disparities that pervade in existing automated vehicle legislation.

In January 2016, President Obama proposed a ten-year, \$3.9 billion program to promote highway safety through the rapid development of automated technologies. Shortly thereafter, NHTSA announced that it was going to take a more active role in developing automated driving policies and/or regulations, and in September 2016, NHTSA issued its Federal Automated Vehicles Policy (“FAVP”), which includes, among other parts, a Model State Policy in an effort to “create a consistent, unified national framework for regulation of motor vehicles with all levels of automated technology, including highly automated vehicles (‘HAVs’).”² According to the USDOT/NHTSA:

The Model State Policy confirms that States retain their traditional responsibilities for vehicle licensing and registration, traffic laws and enforcement, and motor vehicle insurance and liability regimes. Since 2014, USDOT has partnered with the American Association of Motor Vehicle Administrators (‘AAMVA’) to explore HAV policies The shared objective is to ensure the establishment of a consistent national framework rather than a patchwork of incompatible laws.³

The Study Committee on State Regulation of Driverless Cars unanimously recommends the establishment of a Drafting Committee for an Act on Highly Automated Vehicles, and that the Drafting Committee’s charge primarily include the *deployment* of HAVs. The Study Committee recommends that the Drafting Committee’s charge exclude traditional automated vehicle *testing*, as such testing is well underway in many States, and from a drafting perspective corresponding legislation will likely be obsolete by the time a final Act is ripe for adoption. The Study Committee further recommends that the Drafting Committee’s charge exclude regulation

¹ National Conference Of State Legislatures website, www.ncsl.org, Autonomous Self-Driving Vehicles Legislation.

² Attached hereto as Exhibit A is a copy of the USDOT/NHTSA September 2016 Federal Automated Vehicle Policy (“FAVP”).

³ FAVP at p. 7.

of heavy trucks and similar HAVs, and that such HAVs be the subject of a separate study and perhaps drafting project. Such HAVs comprise a distinct array of technological, political and policy issues – and involve a group of likely observers (including union groups and other major organizations), that were not vetted during the Study Committee process and have not participated as observers during the Study Committee process. In addition, the Study Committee acknowledges that some automated driving concepts may emerge during the course of any future drafting project, and that such concepts may be beyond the scope of what the Drafting Committee can anticipate or address during the drafting process. The Study Committee concludes that an Act for the State Regulation of Deployed Highly Automated Vehicles will help to create a consistent, unified national framework for regulating motor vehicles with the highest levels of automated technology – and thereby encourage future developments in this regard.

Analysis

I. A Note On Automation Levels & Automated Driving

Various categorical definitions exist regarding vehicle automation levels. In an effort to establish much needed standardization in this regard, the FAVP adopts the SAE International definitions for automation levels, which divides vehicles into levels based on *who does what and when* regarding automated vehicle operation. Following are general SAE International J3016 (“SAE”) definitions, which the Study Committee recommends for adoption by a future Drafting Committee should one be appointed:

- (A) SAE Level 0 (No Automation)
The full-time performance by the human driver of all aspects of the dynamic driving task, even when enhanced by warning or intervention systems.
- (B) SAE Level 1 (Driver Assistance)
The driving mode-specific execution by a driver assistance system of either steering or acceleration/deceleration using information about the driving environment and with the expectation that the human driver perform all remaining aspects of the dynamic driving task.
- (C) SAE Level 2 (Partial Automation)
The driving mode-specific execution by one or more driver assistance systems of both steering and acceleration/deceleration using information about the driving environment and with the expectation that the human driver perform all remaining aspects of the dynamic driving task.
- (D) SAE Level 3 (Conditional Automation)
The driving mode-specific performance by an automated driving system of all aspects of the dynamic driving task with the expectation that the human driver will respond appropriately to a request to intervene.

- (E) **SAE Level 4 (High Automation)**
The driving mode-specific performance by an automated driving system of all aspects of the dynamic driving task, even if a human driver does not respond appropriately to a request to intervene.
- (F) **SAE Level 5 (Full Automation)**
The full-time performance by an automated driving system of all aspects of the dynamic driving task under all roadway and environmental conditions that can be managed by a human driver.

A noteworthy point of clarification is in order regarding the distinction between automated driving, automated driving systems, and vehicles with automated driving systems.

- **Automated Driving**
Automated driving occurs when a computer rather than a human performs all the real-time functions of driving, including monitoring the driving environment, directing the vehicle's steering, braking, and accelerating, and communicating with other road users.
- **Automated Driving System (ADS)**
An automated driving system (ADS) is the combination of hardware and software that performs real-time driving functions and, in so doing, replaces the traditional human driver. SAE Level 5 automated driving systems can replace human drivers under all driving conditions, from chaotic city streets to remote mountain passes. Because such universal capability may not be imminent, most discussion focuses on SAE Level 4 automated driving systems, which can replace human drivers only under a defined set of driving conditions known as the operational design domain (ODD). An ODD might include geographic areas, road types, weather conditions, travel speeds, and other constraints.
- **Vehicles With Automated Driving Systems**
Vehicles are operated – either by a human driver or by an automated driving system. Some vehicles equipped with a Level 4 automated driving system might function only when that system is engaged and only within that system's ODD. These vehicles will generally lack traditional steering wheels and foot-operated pedals. Other vehicles equipped with a Level 4 automated driving system may retain these traditional driver inputs so that a human driver can operate the vehicle outside of the automated driving system's ODD. However, Level 4 (and 5) systems never "force" a human to become a driver. In contrast, Level 3 automated driving systems can force a human to begin operating a vehicle when the system reaches conditions that it cannot handle.

For simplicity, NHTSA defines a highly automated vehicle (HAV) as a vehicle equipped with an SAE level 3, 4, or 5 automated driving system. Similarly, this Report uses the term HAV to refer to a vehicle that is equipped with, operated by, or transitioning to or from operation by an automated driving system. For technological and prudential reasons, any future Drafting Committee should focus principally on Level 4 and 5 automated driving systems, which is well within the Study Committee's original charge from Scope and Program, as follows:

Autonomous vehicle technology is rapidly maturing, and that technology (or driverless cars) will soon be ready to test nationwide. Four states and the District of Columbia have already enacted legislation concerning some aspects of state regulation of driverless cars, and the National Highway Transportation [sic] Safety Administration (NHTSA) has issued guidelines for states that may seek to regulate driverless cars. This committee will study the need for and feasibility of drafting state legislation concerning the regulation of driverless cars.

SAE Level 4 and SAE Level 5 contemplate *driverless cars*, which are vehicles comprising an automated driving system capable of conducting driving tasks and monitoring the driving environment under defined conditions without human intervention. In addition, SAE J3016 taxonomy defines an Automated Driving System – Dedicated Vehicle (“ADS-DV”) as “[a] vehicle designed to be operated exclusively by a level 4 or level 5 ADS for all trips.” The Study Committee recommends that any future Drafting Committee address Level 4 and 5 automated driving, including vehicles equipped with a Level 4 or 5 ADS, regardless of whether the vehicles are ADS-DVs.

II. A Note On Operational Design Domains (“ODDs”)

An automated driving system (ADS) is the combination of hardware and software that performs real-time driving functions and, in so doing, replaces the traditional human driver. SAE Level 5 automated driving systems can replace human drivers under *all* driving conditions, whereas SAE Level 4 automated driving systems can replace human drivers only under a *defined set of driving conditions* known as the operational design domain (ODD).

III. Etiology Of Automated Vehicles - Driverless Cars

The forward evolution of motor vehicle technology is well documented in the United States, and is credited for saving hundreds of thousands of American lives over the years. Once believed to be controversial, Twentieth Century automotive technological developments such as seat belts, air bags and child car seats, have now become standard operating equipment – and undoubtedly essential in daily motor vehicle operation. Likewise, early Twenty First Century automated vehicle technologies, including automatic emergency braking and lane departure warnings, have already made U.S. roadways safer. Ongoing vehicle automation developments, including progress toward fully automated vehicles, promise to deliver exponentially greater advantages not only with respect to vehicle and passenger safety, but also will – importantly –

expand transportation alternatives for individuals who are currently unable to fully utilize passenger vehicles, including senior citizens and visually impaired otherwise disabled citizens. HAVs are likely to help provide personal transportation to those who are not legally eligible to drive, physically capable of driving, or financially able to afford vehicle ownership. Thus, the rise of vehicle automation is inevitable, and for good reasons, well underway. According to the USDOT/NHTSA:

[T]he excitement around highly automated vehicles (HAVs) starts with safety. Two numbers exemplify the need. First, 35,092 people died on U.S. roadways in 2015 alone. Second, 94 percent of crashes can be tied to a human choice or error. An important promise of HAVs is to address and mitigate that overwhelming majority of crashes. Whether through technology that corrects for human mistakes, or through technology that takes over the full driving responsibility, automated driving innovations could dramatically decrease the number of crashes tied to human choices and behaviors. HAVs also hold a learning advantage over humans. While a human driver may repeat the same mistakes as millions before them, an HAV can benefit from the data and experience drawn from thousands of other vehicles on the road. USDOT is also encouraged about the potential for HAV systems to use other complimentary sensor technologies such as vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) capabilities to improve system performance The benefits don't stop with safety. Innovations have the potential to transform personal mobility and open doors to people and communities – people with disabilities, aging populations, communities where car ownership is prohibitively expensive, or those who prefer not to drive or own a car – that today have limited or impractical options.⁴

The tenacious and sustained HAV development efforts in the automobile and technological industries clearly demonstrates the potential of this technology. The positive potential of vehicle automation is undeniable, revolutionary, and worthy of every reasonable effort to accelerate its evolution and full availability in the marketplace. The ULC is uniquely equipped to provide leadership, experience and know-how in drafting uniform legislation in this space that will facilitate the evolution and full use of these technologies nationwide.

IV. Existing Laws and Trends

According to the USDOT/NHTSA, the goal of State policies in the automated vehicle realm should be *sufficiently consistent* to avoid a patchwork of inconsistent State laws that could impede innovation and the expeditious and widespread distribution of safety enhancing automated vehicle technologies.⁵ As the following table demonstrates, a patchwork of inconsistent State laws is precisely what has developed over the past few years as an increasing

⁴ FAVP at p. 5.

⁵ FAVP at p. 39 (emphasis added).

number of States⁶ have forged ahead, independently, to provide much needed legislative solutions in the automated vehicle marketplace.⁷

STATE	LEGISLATIVE ACTION SYNOPSIS
California	<ul style="list-style-type: none"> <li data-bbox="363 541 1490 940">➤ As amended, legislation defines: "autonomous technology" as "technology that has the capability to drive a vehicle without the active physical control or monitoring by a human operator"; "autonomous vehicle" as "any vehicle equipped with technology that has the capability of operating or driving the vehicle without the active physical control or monitoring of a natural person, whether or not the technology is engaged, excluding vehicles equipped with one or more systems that enhance safety or provide driver assistance but are not capable of driving or operating the vehicle without the active physical control or monitoring of a natural person"; and "operator" of an autonomous vehicle as "the person who is seated in the driver's seat, or if there is no person in the driver's seat, causes the autonomous technology to engage." For the purposes of this article an "autonomous vehicle" meets the definition of Levels 3, 4, or 5 of the Society of Automotive Engineers' <i>Taxonomy and Definitions for Terms Related to On-Road Motor Vehicle Automated Driving Systems.</i>" <li data-bbox="363 978 1490 1310">➤ Finds that the state "presently does not prohibit or specifically regulate the operation of autonomous vehicles"; required rulemaking before 2015; permits current operation under certain conditions; imposes additional oversight on the operation of vehicles without a human in the driver's seat; and requires that the "manufacturer of the autonomous technology installed on a vehicle shall provide a written disclosure to the purchaser of an autonomous vehicle that describes what information is collected by the autonomous technology equipped on the vehicle." Recent amendment struck previous language stating "the intent of the Legislature that current law governing the conversion of vehicles originally manufactured by a third party shall control issues of liability arising from the operation of the autonomous vehicle if that vehicle was converted by an autonomous technology manufacturer." (September 2012) <li data-bbox="363 1348 1490 1512">➤ Requires the Department of the California Highway Patrol to adopt safety standards and performance requirements to ensure the safe operation and testing of autonomous vehicles, as defined, on the public roads in this state. Permits autonomous vehicles to be operated or tested on the public roads in this state pending the adoption of safety standards and performance requirements that would be adopted under this bill. (September 2012) <li data-bbox="363 1549 1490 1604">➤ On December 16, 2015 the California Department of Motor Vehicles ("DMV") released the draft deployment regulations for review. Two public workshops were held to allow

⁶ Sixteen States introduced automated vehicle legislation in 2015; twelve States introduced such legislation in 2014; nine States and District of Columbia introduced automated vehicle legislation in 2013; and six States introduced automated vehicle legislation in 2012. Reportedly, since 2012, approximately 34 States and the District of Columbia have considered some aspect of automated vehicle legislation. National Conference Of State Legislatures website, www.ncsl.org, Autonomous Self-Driving Vehicles Legislation.

⁷ Gabriel Weiner and Bryant Walker Smith, Automated Driving: Legislative and Regulatory Action, cyberlaw.stanford.edu/wiki/index.php/Automated_Driving:_Legislative_and_Regulatory_Action; National Conference Of State Legislatures website, www.ncsl.org, Autonomous Self-Driving Vehicles Legislation.

California	<p>interested parties to provide input on the draft regulations.</p> <ul style="list-style-type: none"> ➤ Authorizes the Contra Costa Transportation Authority to conduct a pilot project testing autonomous vehicles that are not equipped with steering wheels, brake pedals, accelerators, or operators inside, at specified locations and speeds under 35 miles per hour. (September 2016) ➤ On September 30, 2016, the DMV released the revised draft deployment regulations. The DMV held a public workshop on the draft regulations on October 19, 2016 at the State Capitol. The revised deployment regulations comprise the requirements that an autonomous vehicle may be deployed on public roads for non-testing use only when the manufacturer of the vehicle meets specific requirements, including the requirement that the manufacturer has in place and has provided the department with evidence of the manufacturer’s ability to respond to a judgment or judgments for damages for personal injury, death, or property damage arising from collisions or accidents caused by the autonomous vehicles produced by the manufacturer in the form of an instrument of insurance, or a surety bond, or proof of self-insurance. (September 2016)
Nevada	<ul style="list-style-type: none"> ➤ Authorizes operation of autonomous vehicles and a driver’s license endorsement for operators of autonomous vehicles. Defines: “autonomous technology” as “technology which is installed on a motor vehicle and which has the capability to drive the motor vehicle without the active control or monitoring of a human operator. The term does not include an active safety system or a system for driver assistance, including, without limitation, a system to provide electronic blind spot detection, crash avoidance, emergency braking, parking assistance, adaptive cruise control, lane keeping assistance, lane departure warning, or traffic jam and queuing assistance, unless any such system, alone or in combination with any other system, enables the vehicle on which the system is installed to be driven without the active control or monitoring of a human operator.” Defines <u>Operator</u> as follows: “a person shall be deemed the operator of an autonomous vehicle which is operated in autonomous mode when the person causes the autonomous vehicle to engage, regardless of whether the person is physically present in the vehicle while it is engaged.” ➤ Prohibits the use of cell phones or other handheld wireless communication devices while driving in certain circumstances, and makes it a crime to text or read data on a cellular phone while driving. Permits use of such devices for persons in a legally operating autonomous vehicle. These persons are deemed not to be operating a motor vehicle for the purposes of this law. (June 2011) ➤ Amends Nevada's autonomous driving statute to, <i>inter alia</i>, (1) incorporate and potentially modify certain rules promulgated by the DMV, (2) addresses liability of the original manufacturer of a vehicle on which a third party has installed autonomous technology, and (3) add "except in case of emergency" to the statement "that a person is not required to actively drive an autonomous vehicle." (June 2013) ➤ Requires an autonomous vehicle that is being tested on a highway to meet certain conditions relating to a human operator. Requires proof of insurance. Prohibits an autonomous vehicle from being registered in the state, or tested or operated on a highway within the state, unless it meets certain conditions. Provides that the manufacturer of a vehicle that has been converted to

Nevada	<p>be an autonomous vehicle by a third party is immune from liability for certain injuries. (June 2013)</p> <ul style="list-style-type: none">➤ Provides for endorsement on driver's license to operate; regulations. The Department shall by regulation establish a driver's license endorsement for the operation of an autonomous vehicle on the highways of this State. The driver's license endorsement described in this section must, in its restrictions or lack thereof, recognize the fact that a person is not required to actively drive an autonomous vehicle.➤ Requires vehicles to meet federal standards and regulations for registration; requirements for testing or operating upon highways in this State.<ol style="list-style-type: none">1. An autonomous vehicle shall not be registered in this State unless the autonomous vehicle meets all federal standards and regulations that are applicable to a motor vehicle.2. An autonomous vehicle shall not be tested or operated on a highway within this State unless the autonomous vehicle is:<ol style="list-style-type: none">(a) Equipped with a means to engage and disengage the autonomous technology which is easily accessible to the human operator of the autonomous vehicle;(b) Equipped with a visual indicator located inside the autonomous vehicle which indicates when autonomous technology is operating the autonomous vehicle;(c) Equipped with a means to alert the human operator to take manual control of the autonomous vehicle if a failure of the autonomous technology has been detected and such failure affects the ability of the autonomous technology to operate safely the autonomous vehicle; and(d) Capable of being operated in compliance with the applicable motor vehicle laws and traffic laws of this State.➤ Requires Certificate of compliance to operate vehicle in autonomous mode; operation without physical presence of operator; operator deemed to be driver under certain circumstances. An autonomous vehicle that has been registered in this State may be operated in autonomous mode in this State only if a certificate of compliance has been issued for the autonomous vehicle pursuant to NAC 482A.190. If the certificate of compliance certifies that the autonomous vehicle is capable of being operated in autonomous mode without the physical presence of the operator in the vehicle, the person may operate the vehicle in this State without being physically present in the autonomous vehicle.➤ For the purpose of enforcing the traffic laws and other laws applicable to drivers and motor vehicles operated in this State, the operator of an autonomous vehicle that is operated in autonomous mode shall be deemed the driver of the autonomous vehicle regardless of whether the person is physically present in the autonomous vehicle while it is engaged.➤ G endorsement on driver's license required for operation: Application; fee. A person who holds a driver's license in this State and wishes to operate an autonomous vehicle in autonomous mode in this State must obtain a G endorsement on his or her driver's license from the Department pursuant to NAC 483.110 before the person may operate an autonomous vehicle in this State. A person may apply for such an endorsement by submitting an application on a form provided by the Department. (April 2014)
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Nevada	
Utah	<ul style="list-style-type: none"> ➤ Authorizes the department of transportation to conduct a connected vehicle testing program. (March 2015) ➤ Requires a study related to autonomous vehicles, including evaluating NHTSA and AAMVA standards and best practices, evaluating appropriate safety features and regulatory strategies and developing recommendations. (March 2016) ➤ Has published a document entitled “Best Practices For Regulation Of Autonomous Vehicles On Utah Highways”, which defines: “<u>autonomous vehicle</u>” as a vehicle that “performs safety-critical driving functions and monitors roadway conditions for an entire trip. While a human (who might be a rider, or might simply be sending the vehicle to a destination) may provide destination or navigational input, that person is not expected to be available for control of the vehicle at any time during the trip”; “<u>connected vehicles</u>” as vehicles that “utilize communication technologies and uses information from external sources to increase the driver’s situational awareness. The connected vehicle provides information to the driver based on things it can ‘learn’, using sources outside the vehicle”; “<u>vehicle automation</u>” as “features that are automated to perform individual tasks. A car need not be fully, or even highly, autonomous to include some level of vehicle automation [Vehicle automation includes] [a]daptive cruise control ... [l]ane keeping assist ... [and] [a]utomated parking systems”; “<u>connected autonomous vehicles</u>” as “a vehicle that integrates both autonomous and connected technologies”; and “<u>driverless vehicle</u>” as follows - “[t]he term ‘driverless’ is sometimes used for autonomous vehicles, but this term isn’t strictly correct. First, a driver might be present even though the vehicle is capable of self-driving. Additionally, there is some momentum for defining the driver as the computer system, the vehicle manufacturer, or the vehicle itself.” (October 2016)
North Dakota	<ul style="list-style-type: none"> ➤ Establishes a legislative management study of automated vehicles, including what, if any, current laws need to be changed to accommodate the introduction or testing of automated motor vehicles in North Dakota and any automated corridors affecting North Dakota. Provides for a study of autonomous vehicles. Includes research into the degree that automated motor vehicles could reduce traffic fatalities and crashes by reducing or eliminating driver error and the degree that automated motor vehicles could reduce congestion and improve fuel economy. The legislative management shall report its findings and recommendations, together with any legislation required to implement the recommendations, to the sixty-fifth legislative assembly. (March 2015) ➤ Defines: “<u>automated motor vehicle</u>” as “a vehicle capable of operating in a full automation mode”; and “<u>full automation</u>” as “the unconditional, full-time performance by an automated driving system of all aspects of the dynamic driving task.” ➤
Michigan	<ul style="list-style-type: none"> ➤ Defines: “<u>automated technology</u>” as “technology installed on a motor vehicle that has the capability to assist, make decisions for, or replace an operator”; “<u>automated motor vehicle</u>” as “a motor vehicle on which automated technology has been installed, either by a manufacturer of automated technology or an upfitter that enables the motor vehicle to be operated without any control or monitoring by a human operator. Automated motor vehicle does not include a motor vehicle enabled with 1 or more active safety systems or operator assistance systems, including, but not limited to, a system to provide electronic blind spot assistance, crash avoidance, emergency braking, parking assistance, adaptive cruise control, lane-keeping assistance, lane departure warning, or traffic jam and queuing assistance, unless 1 or more of these technologies

Michigan	<p>alone or in combination with other systems enable the vehicle on which the technology is installed to operate without any control or monitoring by an operator”; and "<u>automated mode</u>" as “the mode of operating an automated motor vehicle when automated technology is engaged to enable the motor vehicle to operate without any control or monitoring by an operator.”</p> <ul style="list-style-type: none"> ➤ Expressly permits testing of automated vehicles by certain parties under certain conditions, addresses liability of the original manufacturer of a vehicle on which a third party has installed an automated system, directs state USDOT with Secretary of State to submit report by Feb. 1, 2016. (December 2013) ➤ Declares that the original manufacturer of a vehicle is not liable for damages resulting from another person's conversion or attempted conversion of the vehicle into an automated motor vehicle, or the modification of installed equipment, unless the defect from which the damages resulted was present in the vehicle when it was manufactured. Similarly addresses liability of subcomponent system producers for equipment installed by those producers to convert vehicles into automated motor vehicles. (December 2013) ➤ Allows for autonomous vehicles under certain conditions. Allows operation without a person in the autonomous vehicle. (December 2013) ➤ Allows for the creation of mobility research centers where automated technology can be tested. Provides immunity for automated technology manufacturers when modifications are made without the manufacturer's consent. (December 2013)
Virginia	<ul style="list-style-type: none"> ➤ Allows the viewing of a visual display while a vehicle is being operated autonomously. (April 2016)
Tennessee	<ul style="list-style-type: none"> ➤ Prohibits local governments from prohibiting the use of a vehicle solely on the basis of it being equipped with autonomous technology if the vehicle otherwise complies with applicable safety regulations. Defines "<u>autonomous technology</u>" as technology "that has the capability to drive [a] motor vehicle without the active physical control or monitoring by a human operator." (May 2015) ➤ Allows a motor vehicle to be operated, or to be equipped with, an integrated electronic display visible to the operator while the motor vehicle's autonomous technology is engaged. (March 2016) ➤ Establishes certification program through The Department Of Safety for manufacturers of autonomous vehicles before such vehicles may be tested, operated, or sold; creates a per mile tax structure for autonomous vehicles. (April 2016)
Louisiana	<ul style="list-style-type: none"> ➤ Defines "<u>autonomous technology</u>" as “technology installed on a motor vehicle that has the capability to drive the vehicle on which the technology is installed in high-or full-automation mode, without any supervision by a human operator, with specific driving mode performance by the automated driving system of all aspects of the dynamic driving task that can be managed by a human driver, including the ability to automatically bring the motor vehicle into a minimal-risk condition in the event of a critical vehicle or system failure, or other emergency event.” (June 2016)

Florida	<ul style="list-style-type: none"> ➤ As wholly amended, defines: "<u>autonomous technology</u>" as "technology installed on a motor vehicle that has the capability to drive the vehicle on which the technology is installed without the active control or monitoring by a human operator. The term excludes a motor vehicle enabled with active safety systems or driver assistance systems, including, without limitation, a system to provide electronic blind spot assistance, crash avoidance, emergency braking, parking assistance, adaptive cruise control, lane keep assistance, lane departure warning, or traffic jam and queuing assistant, unless any such system alone or in combination with other systems enables the vehicle on which the technology is installed to drive without the active control or monitoring by a human operator"; and "<u>autonomous vehicle</u>" as "any vehicle equipped with autonomous technology." ➤ Finds that the state does not prohibit or specifically regulate the testing or operation of autonomous technology in motor vehicles on public roads," specifies that "[a] person who possesses a valid driver license may operate an autonomous vehicle in autonomous mode," addresses liability of the original manufacturer of a vehicle on which a third party has installed autonomous technology, establishes certain conditions under which an autonomous vehicle may be tested, and directs state DHSMV to prepare a specific report for the legislature by February 2014. (April 2012) ➤ Bans texting but exempts operators of autonomous vehicles operating in autonomous mode. (May 2013) ➤ Permits operation of autonomous vehicles on public roads by individuals with a valid driver license. This bill eliminates the requirement that the vehicle operation is being done for testing purposes and removes a number of provisions related to vehicle operation for testing purposes. Eliminates the requirement that a driver be present in the vehicle. Requires autonomous vehicles to meet applicable federal safety standards and regulations. (April 2016) ➤ Defines driver-assistive truck platooning technology. Requires a study on the use and safe operation of driver-assistive truck platooning technology and allows for a pilot project upon conclusion of the study. (April 2016)
District of Columbia	<ul style="list-style-type: none"> ➤ Defines "<u>autonomous vehicle</u>" as "a vehicle capable of navigating District roadways and interpreting traffic-control devices without a driver actively operating any of the vehicle's control systems," requires a human driver "prepared to take control of the autonomous vehicle at any moment," restricts conversion to recent vehicles, and addresses liability of the original manufacturer of a converted vehicle. Final version <i>removed</i> previous provisions requiring autonomous vehicles to operate on alternative fuels and imposing a vehicle-miles-traveled tax in lieu of DC motor fuel tax. Passed Congressional review. (April 2013).

In addition to the legislative excerpted above, two States – Arizona and Massachusetts – have Executive Orders in place regarding automated vehicles. Arizona Governor Doug Ducey signed an Executive Order in late August 2015 directing various agencies to “undertake any necessary steps to support the testing and operation of self-driving vehicles on public roads within Arizona.” Governor Ducey also ordered that pilot programs be established at designated universities and developed corresponding program rules to be followed by each pilot program. The Executive Order further establishes a Self-Driving Vehicle Oversight Committee within the Governor’s Office.

In October 2016 Massachusetts Governor Charlie Baker signed an Executive Order “[T]o Promote the Testing and Deployment of Highly Automated Driving Technologies.” Correspondingly, the Executive Order creates an AV working group, which is expected to work

with experts on vehicle safety and automation, work with legislative members on proposed legislation, and support agreements that AV companies will enter with the State USDOT, municipalities and State agencies.

Various other states are in the process of adopting automated vehicle legislation, including Washington, Minnesota, Illinois, New York, Pennsylvania, and North Carolina.⁸ Many states have declined to enact automated vehicle legislation, including Oregon, Idaho, Colorado, Arizona, South Dakota, Wisconsin, Tennessee, New Hampshire, Maryland, Missouri, Minnesota, Oklahoma, Alabama, Virginia, Georgia, South Carolina, Texas, and Hawaii.⁹

This brief synopsis of State's efforts to regulate and embrace automated vehicle technology demonstrates obvious definitional and substantive regulatory disparities from State-to-State, and correspondingly emphasizes the need for, and propriety of, uniform legislation in this area. Consistent with the USDOT/NHTSA Model Policy, the Study Committee recommends that a Drafting Committee be appointed to draft uniform legislation comprising HAVs, which will "help to avoid a patchwork of inconsistent laws and regulations among the 50 States and other U.S. jurisdiction[s], which could delay the widespread deployment of these potentially lifesaving technologies."¹⁰

V. Drafting Committee Focus

The Study Committee recommends the appointment of a Drafting Committee on the State Regulation of Highly Automated Vehicles with a charge to: prepare a free standing Act on the State Regulation of Deployed Highly Automated Vehicles.

Automated vehicle technology continues to evolve at a fairly rapid pace, and to that end the Study Committee recommends that the Drafting Committee consider the following issues regarding Highly Automated Vehicles, with the understanding that additional issues may surface and require analysis during the Drafting Committee process.

A. The Absence Of A Human Driver In HAVs

States currently regulate human drivers. However, fully automated vehicles are driven entirely by the vehicle itself and as a technical matter require no licensed human driver – the entire driving operation can be performed by an automated driving system from an origin to some destination. In light of these facts, the Drafting Committee should consider the following issues:

⁸ National Conference Of State Legislatures website, www.ncsl.org, Autonomous Self-Driving Vehicles Legislation; Gabriel Weiner and Bryant Walker Smith, Automated Driving: Legislative and Regulatory Action, cyberlaw.stanford.edu/wiki/index.php/Automated_Driving:_Legislative_and_Regulatory_Action.

⁹ *Id.*

¹⁰ FAVP at p. 3.

- (i) What key terms (such as *automated technology*, *automated vehicle*, *automated driving system*, *operator*) require definitional uniformity to facilitate an efficient nationwide transition from human-driven vehicles to automated vehicles?¹¹
- (ii) What current State laws/regulations are applicable regarding law enforcement's routine and emergency responses involving HAVs, and what provisions should be included in an Act to facilitate uniformity in this regard?
- (iii) What current State laws/regulations are applicable regarding the safety of occupants in HAVs and other road users, and what provisions should be included in an Act to facilitate uniformity in this regard?
- (iv) What current State laws/regulations are applicable regarding HAV crash investigations and crash information reporting, and what provisions should the Drafting Committee incorporate into an Act to facilitate uniformity in this regard?
- (v) What current State laws/regulations are applicable regarding the collection, use, retention and/or deletion of non-crash related data recorded and retrieved from automated driving systems, and what provisions should be included in an Act to facilitate uniformity in this regard?
- (vi) What current State laws/regulations are applicable to HAV safety inspections, safety certifications and similar efforts to document HAV safety, and what provisions should the Drafting Committee incorporate into an Act to facilitate uniformity in this regard?
- (vii) What current State laws/regulations are applicable to HAV education, training and certification (including for HAV operators, passengers, police and fire officers, emergency medical services, tow and recovery services, etc.), and what provisions should the Drafting Committee incorporate into an Act to facilitate uniformity in this regard?
- (viii) What current State laws/regulations are applicable to HAV modifications and maintenance (including but not limited to hardware, software and structural modifications/maintenance), and what provisions should the

¹¹ See FAVP at p. 44 (“In order to make the transition from human-driven motor vehicles equipped with automated safety technologies to fully automated vehicles, gaps in current regulations should be identified and addressed by the States (with the assistance of NHTSA).”)

Drafting Committee incorporate into an Act to facilitate uniformity in this regard?

B. Vehicle Registration And Title

- (i) What current State laws/regulations are applicable to identifying HAV technologies on vehicle title and registration documentation, and what provisions should the Drafting Committee incorporate into an Act to facilitate uniformity in this regard?
- (ii) What current State laws/regulations are applicable for providing notification to a designated State agency when HAV technologies are installed on a vehicle after the initial purchase of the vehicle, and what provisions should the Drafting incorporate into an Act to facilitate uniformity in this regard?

C. Liability And Insurance

According to the USDOT/NHTSA, States are responsible for determining liability rules for HAVs. States should consider how to allocate liability among HAV owners, operators, passengers, manufacturers, and others when a crash occurs. “In the future, the States may identify additional liability issues and seek to develop consistent solutions. It may be desirable to create a commission to study liability and insurance issues and make recommendations to the States.”¹²

The Study Committee acknowledges the challenges of comprehensively evaluating prospective tort liability laws and rules that could affect HAV deployment and future evolution. Consequently, and consistent with the USDOT/NHTSA position in this regard, the Study Committee unanimously agrees that HAV liability and insurance issues are sufficiently complex to warrant establishing a separate study/advisory committee to analyze and report on relevant issues in this regard, except that a future Drafting Committee’s work will necessarily implicate some aspects of liability (e.g., application of existing rules of the road).

VI. Highly Automated Vehicles Meet Our Criteria For A Uniform Act

Both the nature and logical evolution of HAVs implicate interstate commerce, as fully automated vehicles will eventually be deployed to navigate from points of origin to destinations across State jurisdictional lines. The appointment of a Drafting Committee on the State Regulation Of Highly Automated Vehicles will not only be responsive to addressing existing regulatory disparities, but will also be forward-looking, in anticipation of the swiftly approaching

¹² FAVP at p. 46.

day when HAVs are deployed nationwide. Accordingly:

“NHTSA believes that eventually there should be a consistent set of laws and regulations governing the testing and operation of HAVs. In such an approach NHTSA generally would regulate motor vehicles and motor vehicle equipment (including computer hardware and software that performs functions formerly performed by a human driver) and the States would continue to regulate human drivers, vehicle registration, traffic laws, regulations and enforcement, insurance and liability States may also wish to regulate HAV ‘drivers’ for the limited purpose of enforcement of traffic laws with respect to vehicle [automation] levels L3-L5.”¹³ NHTSA’s Model Policy envisions State regulation of procedures and requirements for granting permission to vehicle manufacturers and owners to test and operate vehicles within a State.

In evaluating the propriety of recommending a ULC Drafting Committee on HAVs, the Study Committee has been fortunate to partner with Cathie Curtis, AAMVA’s Director of Vehicle Programs, in AAMVA’s ongoing work with NHTSA regarding the HAV revolution. Ms. Curtis’ input regarding the Study Committee’s work has been invaluable, and she stands in support of continuing our collaborative efforts in conjunction with a ULC Drafting Committee on HAVs. Our Study Committee has also had the great pleasure of working with Professor Bryant Walker Smith as our Reporter, who has generously offered his expertise and resources to the Study Committee’s efforts, and likewise supports the appointment of a ULC Drafting Committee on HAVs. The National Cooperative Highway Research Program (“NCHRP”) is currently in the process of researching and preparing guidelines and resources for state departments of transportation and departments of motor vehicles to consider as connected/automated vehicles are deployed and become more prevalent in the marketplace. We look forward to collaborating with Betty Serian and the NCHRP team to ensure that future ULC drafting efforts are informed by, and not duplicative of, NCHRP’s upcoming reports and related work product. Several key observers and industry participants have graciously and thoughtfully contributed to the Study Committee’s robust dialogue during this process, and also support the appointment of a ULC Drafting Committee moving forward. The Study Committee is grateful for the support and participation of these and other individuals and organizations during the study process, and strongly recommends continued collaborative efforts and relationships with the future Drafting Committee should one be appointed.

VII. Federal Preemption

The Vehicle Safety Act expressly preempts States from issuing any standards that regulate vehicle performance if such a standard is not identical to an existing Federal Motor Vehicle Safety Standard (FMVSS) regulating the same performance aspect.¹⁴ In addition, the

¹³ FAVP at p. 40.

¹⁴ FAVP at p. 38, citing 49 U.S.C. § 30102(b)(1), stating “[W]hen a motor vehicle safety standard is in effect under this chapter, a State or a political subdivision of a State may prescribe or continue in effect a standard applicable to

United States Supreme Court has found that State laws may be preempted if they stand as an obstacle to the accomplishment and execution of a NHTSA safety standard.¹⁵ The project scope envisioned for a future Drafting Committee would be consistent with the role that NHTSA has articulated for the States.

End

the same aspect of performance of a motor vehicle or motor vehicle equipment only if the standard is identical to the standard prescribed under this chapter.”

¹⁵ *Id.*, citing *Geier v. American Honda Motor Co.*, 529 U.S. 861 (2000).