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Automated Vehicles



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This white paper explores the current definitions and status of automated vehicle technology and policy; the benefits and concerns of its further development; and the state of the current law and various state and federal approaches, including the position of the NHTSA. It concludes with the clinic's policy recommendations: a three-stage outline for legislative implementation of automated vehicle policy.

5/21/2014

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I. Current Technology

In order to properly regulate autonomous vehicle technology, those involved should have a basic understanding of the technology first. The NHTSA has provided a useful guide to the different levels of autonomous vehicles which shows how the technology has developed and will continue to develop. Driverless vehicles rely on various combinations of individual technologies, so learning about these individual technologies reveals more about how autonomous vehicles function. Several companies have begun development of their own driverless cars, and each uses similar but unique combinations of technologies in their vehicles. Effective regulation and legislative requires an informed opinion about where the technology has come from, where it is now, and where it is going in the future.

A. Levels of Vehicle Automation, via the National Highway Traffic Safety Administration (NHTSA)

The NHTSA is a part of the United States Department of Transportation that focuses on vehicle and highway safety. In light of the increased discussion about autonomous technology and driverless cars, it issued a statement on the current state and future direction of the technology.¹ Part of this statement discussed different levels of automation that vehicles can have, from Level 0 (no automation) to Level 4 (full automation). These levels look at factors like the driver's control over primary vehicle functions (speed, brake, throttle, and steering) and their responsibility to monitor the road. These levels are a useful tool and allow for a consistent discussion of the evolution of autonomous vehicle technology.

Level 0: No Automation

Level 0 vehicles require the driver to be responsible for the vehicle's speed and direction of the vehicle at all times. Some Level 0 vehicles employ driver support systems (forward collision warnings, lane departure warnings, blind spot monitoring) in order to help the driver, or automated secondary controls (wipers, headlights, turn signals) that don't require a driver's permission to activate. However, none of these functions intervene in the primary vehicle controls and rely on the driver for all main driving functions.

Level 1: Function-Specific Automation

Level 1 vehicles use one or more specific control functions. The driver is still responsible for the safe operation of the vehicle. However, the driver can give limited authority to the vehicle to perform a primary control (like adaptive cruise control). The vehicle can also automatically assume limited authority over a primary control in some circumstances (electronic stability control, dynamic brake support). However, each automated function then they operates independently. Level 1 technology does not replace driver vigilance and does not assist with both steering and brake/throttle at the same time.

Level 2: Combined Function Automation

Level 2 technology employs the automated primary control functions of Level 1 vehicles in concert (adaptive cruise control and lane centering working together). This means that, unlike with Level 1

¹ Preliminary Statement of Policy Concerning Automated Vehicles, National Highway Traffic Safety Administration, www.nhtsa.gov/staticfiles/rulemaking/pdf/Automated_Vehicles_Policy.pdf

technology, the driver can be physically disengaged from operating the vehicle. However, the driver is still responsible for monitoring the roadway and safely operating the vehicle. Level 2 vehicles can relinquish control back to the driver with little or no advanced warning. Therefore, the driver is expected to be able to resume control of the vehicle on short notice and at all times.

Level 3: Limited Self-Driving Automation

Drivers of vehicles with Level 3 automation can cede full control of all steering and speed-control functions to the vehicle for limited amounts of time. The vehicle will look for changes that require transition back to the driver. The driver must be ready to resume control, but the vehicle gives a comfortable transition time. When a Level 3 vehicle determines that it is no longer able to support automation, it signals that the driver should resume control soon. In Level 3 vehicles, the driver is not expected to be constantly monitoring the road while driving.

Level 4: Full Self-Driving Automation

Vehicles equipped with Level 4 automation technology will be able to control speed and steering functions for an entire trip. The driver will only need to provide destination or navigation information, and will not be required to monitor the roadway. Level 4 automation will be used in both occupied and unoccupied vehicles, truly allowing for a “driverless car.”

B. Autonomous Technology Currently In Use

Autonomous driving technology is already being used in some vehicles, and companies plan on adding more to newer models. It appears that the “driverless car” isn’t something that is going to happen instantaneously, but rather will emerge from the convergence of multiple autonomous vehicle functions. Therefore, we can begin to understand the future of this technology by understanding the technologies that are currently in use.

Level 1 technology was made mandatory on all new light vehicles since the 2011 model year, and level 2 technologies are slowly becoming more commonplace. Car manufacturers are currently working on bringing Level 3 technology to market, and the Mercedes S-Class will be able to drive itself on the highway for up to 10 seconds.² Google’s driverless car is an example of Level 4 technology that can drive itself for an entire trip. Many companies have announced their plans to have Level 4 cars on the market in the next 2-6 years.³ When Level 4 technology eventually hits the market, it will change the way our society and laws view transportation.

There are many vehicles that offer autonomous steering options. These technologies can take the forms of automatic lane centering or automated accident avoidance. Some vehicles also utilize automated speed maintenance, which can be used for near-constant speeds on the highway or highly variable

² Jason Harper, *Mercedes-Benz \$100,000 Sedan Drives Itself*, <http://www.bloomberg.com/news/2013-07-18/mercedes-benz-100-000-sedan-drives-itself-jason-harper.html>

³ See Mobileye, <http://www.slashgear.com/mobileye-wants-self-driving-cars-by-2016-at-a-fraction-of-googles-costs-30284197/>; Google, <http://www.techradar.com/us/news/car-tech/google-wants-some-form-of-self-driving-cars-on-roads-by-2018-1130660>; Nissan, <http://online.wsj.com/news/articles/SB10001424127887323407104579038832031956964>; Daimler, <http://www.reuters.com/article/2013/09/08/us-autoshow-frankfurt-daimler-selfdrive-idUSBRE98709A20130908>; BMW, <http://www.autoguide.com/auto-news/2013/02/bmw-targets-2020-for-self-driving-cars.html>; and Audi, <http://www.leftlanenews.com/audi-predicts-self-driving-cars-by-2020.html>.

speeds in stop-and-go traffic. Several new vehicles have automatic braking capabilities, allowing the vehicle to avoid hitting an object despite poor driver attention or reaction time. And some vehicles on the road today have automatic parallel parking, allowing the vehicle to perform this tricky maneuver by itself.

Most of these functions are made possible by the sensors and communication capabilities of these vehicles. The autonomous vehicles currently being developed employ combinations of sensors, cameras, and maps to “see” what’s around the vehicle. Radar sensors use radio waves, laser sensors use laser beams, and ultrasonic sensors use sound waves. Video cameras detect light in the visible spectrum and infrared cameras detect light in the infrared spectrum. Differential GPS uses fixed reference stations to provide highly accurate positioning information. Onboard maps give the vehicle an idea of the physical layout of the street, which it overlays with information gathered from its sensors and cameras. By understanding how these vehicles view and interact with the world, we can take more informed steps to ensure that they are used safely and constructively.

II. Benefits & Concerns

Understanding autonomous vehicle technology fosters a more intelligent discussion about its benefits and concerns. The goal of enacting legislation around such a technology is to promote the advantages of this technology while limiting or eliminating disadvantages. Since this particular technology offers many benefits, and the concerns are very manageable, legislation is a powerful way to guide this technology into our society.

A. Benefits of Driverless Technology

Autonomous vehicles can have positive impacts on many important aspects of our lives. Their first and most obvious benefit is the safety which they can bring to driving. Autonomous vehicles are also much more efficient in their use of existing infrastructure than human drivers. Increased safety and efficiency allow these vehicles to have less of an environmental impact. They also give mobility options to people who were previously unable to drive on their own. Finally, the driverless car market is young and poised for rapid growth, and regions that get in on the ground floor have lots of potential for economic development and job growth. Each one of these factors is reason enough to support this technology, but all of them combined make a convincing case for supporting driverless technology.

1. Safety

Autonomous vehicles will increase safety on the roads. They will be able to prevent a significant number of the crashes that are caused by human error. Autonomous vehicles can also be programmed to automatically obey all traffic laws, including speed limits. Speeding is a serious traffic and public safety issue that can be effectively eliminated with this technology. These vehicles also have better reaction times than human-controlled vehicles, allowing them to respond more quickly to sudden obstacles.

2. Infrastructure Use

Autonomous vehicles will be able to better utilize existing roadways and infrastructure. They are able to drive more efficiently and thereby fit more vehicles into a given section of roadway. Autonomous

vehicles are also able to park more efficiently, reducing the time and gas spent on finding spaces in crowded parking lots. By utilizing existing infrastructure more efficiently, autonomous vehicles will be able to decrease roadway congestion. They also open up options for car-sharing in ways that current human-driven cars cannot.

3. Environmental

Autonomous vehicles will also have many positive effects on the environment. By driving more efficiently than humans, they can reduce congestion and conserve fuel consumption. Autonomous vehicles will also produce less greenhouse gases than human-driven vehicles and thereby have a positive impact on the environment. The car-sharing potential of driverless cars could also significantly reduce overall emissions.

4. Accessibility

The use of automated vehicle technology will increase the transportation options of several underserved demographics. This includes blind or disabled drivers who are not able to perform all necessary driving functions on their own. This also includes the elderly who are no longer able to safely drive by themselves. In addition, this technology could bring transportation services to people with special needs. Rather than replacing existing public transportation, this could allow investment in supplemental transportation options that cater better to people with specific needs.

5. Economic Opportunities

In 2011, traffic congestion cost Seattle citizens and government \$443,000,000. The average commuter spends a great deal of time and money on their commute. Because of the high cumulative costs of commuting, even a small change in the average efficiency will have a significant societal impact.

Table 1: Economic Impact of Minor Changes in Commute Efficiency

Amount spent because of congestion	City as a whole	Average commuter	Amount with 10% change by autonomous vehicles
Time	39,555,000 hours	29 hours	3,955,000
Dollars	443,000,000 dollars	445 Dollars	44,300,000 dollars
CO2 emissions	386,000,000 pounds	287 pounds	38,600,000
Fuel	19,054,000 *3= 57,162,000 dollars	14*3=42 dollars	1,905,400 *3= 5,716,200

Autonomous vehicles will have many positive economic effects for areas where they are used. By reducing crashes and road fatalities, autonomous vehicles can prevent the related societal costs. This will save countless lives as well as billions of dollars in hospital stays, days of work missed, and property damage. This growing technology also provides many opportunities for potential investors, as well as more high-technology jobs.

B. Concerning Issues of Driverless Technology

We have identified concerns of various citizens and groups about the implementation of testing driverless cars in Washington State and other areas. Below are what we found to be the four major

concerns to implementation of testing. Notably absent are economic concerns, which are discussed later in this paper.

1. Safety

Safety will always be a primary concern, whether in the testing phase or after the technology has gone to market. The simple fact is that no one wants the technology to go to market before it is safe and reliable. The testing phase is crucial to determine the safety and reliability of this emerging technology.

It is easy to imagine situations where an autonomous vehicle may cause accidents. Pedestrian and biking groups are quick to point out that autonomous vehicles may have difficulty sharing the road. Yet the data seems to indicate completely opposite. Driverless vehicles will bring greater safety and certainty to the roads by reacting to unknown objects faster than a human. Software will obey the speed limits and posted traffic signs, which will naturally lead to a reduction in accidents. And most importantly, the software will never be sleepy or intoxicated or distracted. We are confident that in time this technology will be proven to save lives.

2. Privacy

A driverless vehicle will obviously know everywhere you have traveled. In the testing phases this data will be important to manufacturers to know distances traveled and for quality assurance. Once the technology goes to market, steps should be taken to protect and anonymously collect this data and only the data that is absolutely necessary for the safety and reliability purposes.

There is also a concern about law enforcement use of this data. Perhaps this would already be protected by applications of the Fourth Amendment concerning GPS data, but as privacy seems to be eroding in the digital age, steps should be taken to ensure consumer privacy in this area.

Law enforcement may also be concerned about stopping a vehicle that is in autonomous mode. Obviously law enforcement needs this ability, but at the same time consumers should not be made captives in their own vehicle. There may be an interactive mechanism developed for this, or the car would need to be taken out of autonomous mode and manually pulled over by the driver.

3. Liability

When novel technologies enter the market, society initially tries to fit it into a mold of existing technologies. Thus, driverless cars would be treated like cars with drivers. In this sense, liability is assigned to the driver of the car, even if it is in driverless mode.

Another facet is that society considers early adopters to be risk-takers that should bear the burden of liability for this new risky technology. This could be troubling to insurers, as they might be the ones taking on the yet unknown risk for their insured drivers.

If liability were to be pushed on to manufacturers, claims involving design defects or system malfunction might involve complex analysis of computer code that will be difficult for the legal system to deal with. It is more likely that drivers would initially be forced to consent to the risk of using the autonomous driving technology. As the technology evolves and becomes widely used, the litigation may involve specifying risks that are not acceptable for manufacturers to pass on to the drivers.

In the testing phase, liability will be completely assigned to the manufacturer, because it represents the driver who must be an employee or person designated by the manufacturer. Bond requirements make sure that the manufacture is prepared to pay for any damage it causes. In the testing environment, the bond requirement also serves to keep everyone but the most serious developers off the streets, which also helps with safety.

4. Fear of technology

This seems to come from various groups that are simply averse to change. The problem is that this technology will be entering the market in the next 3 to 7 years, and the legal system should take steps now to safely integrate and regulate the technology. Google and other developers of the technology are working to make it accessible and appealing to everyone, and to get information out about the great benefits this technology bring when it comes to market.

III. Current Legal Landscape

Summary of various state approaches

Every state with enacted legislation has largely borrowed from each other. Issues relating to the physical presence of the driver, testing, and scope of the law are nearly identical. All states require some form of manual override, with varying degrees of specific requirements for the technology.

States have largely ignored the liability issue thus far, passing the responsibility on to their respective licensing agencies. This is likely intended to allow insurance companies to submit comments on the liability issues when agencies initiate the rulemaking processes.

The states which actively allow and regulate AV testing are FL, CA, MI, NV, and the District of Columbia.

Table 2: Summary of Differences between State Approaches to Automated Vehicles

	NV	FL	CA	DC	MI
License	endorsement	not expressed	employees only	not expressed	employees only
Risk management	physical presence required minimum 10,000 miles autonomous drive required prior to highway drive	physical presence required	physical presence required	physical presence required	physical presence required
Limitation on driving condition	geographical limitation	not expressed	public roads	public roadway	highway or street
Reporting requirement	not expressed	not expressed	not expressed ⁴	not expressed	not expressed
Transition capability	required	required	required	required	required
System failure detection	required	required	required	not expressed	not expressed
Federal requirement	expressed	expressed	expressed	not expressed	not expressed
Recording data	required	not expressed	required	not expressed	not expressed
Testing only	expressed	not expressed	expressed	not expressed	not expressed
Liability	limited liability	limited liability	not expressed	limited liability	limited liability
Insurance for testing	5 million USD	5 million USD	5 million USD	not expressed	not expressed

Table 3: Summary of Unique Features in Automated Vehicle Regulation by State

Nevada (NV)	- considering sales: "certificate of compliance" is required prior to sell the AV - "certificate of compliance" allows to operate AC without physical present
Florida (FL)	- no detailed provision
California (CA)	- no provision for liability
Washington D.C. (DC)	- no detailed provision - no provision for insurance requirement
Michigan (MI)	- no detailed provision - no provision for insurance requirement

⁴ California's most recent rulemaking included an affirmative reporting requirement for any time the vehicle is unexpectedly disengaged from autonomous mode. Google and Volkswagen pushed back, claiming this requirement will be too onerous and require reporting of many normal events. California may be overreaching, but clearly the reporting requirement is being proposed and testers are moving towards reporting incidents to the California DMV.

Existing Laws and Policies

1. Definitions and scope

All approaches, including Washington's HB 1649, exclude all other assistive technologies which require an attentive driver to operate the vehicle. These approaches have near-identical language to HB 1649. As a result, all intermediary assistive technologies would be governed under existing traffic codes.

Furthermore, states that have addressed the issue of an unoccupied driverless vehicle, such as California and Florida, have defined "operator" of a driverless vehicle to include those who cause the vehicle to operate in driverless mode. As a result, this approach would place all rights and responsibilities on the person "causing the autonomous technology to engage" a driverless vehicle, until another person would either take control or cause the vehicle to operate in driverless mode. Washington, D.C. is silent on this particular issue.

2. Authority on rules and regulations

One aspect that sets HB 1649 apart from other approaches is that it requires the Washington Department of Licensing to work with Washington State Patrol in developing safety regulations, as opposed to merely suggesting collaboration.⁵ For instance, California charges its Department of Motor Vehicles to adopt safety standards by 2015, and adopt additional safety standards for operation without an operator in the driver's seat of a driverless vehicle.⁶ Washington, D.C. places rulemaking authority in the Mayor's Office.⁷

If Washington State DOL or WSP adopt rules that require certain standard to be met, there is a potential that the state could take on liability for setting those standards. In the testing phase, this may not be an issue as manufacturers are still taking responsibility for accidents. However, when the technology goes to market, we anticipate that there will be federal standards in place so that states are not bearing any responsibility for vehicle standards.

3. Legislating the testing phase

All enacted legislation permits the testing of driverless vehicles on public roads. Every state also limits operation of driverless vehicles to manufacturer designees during testing. When an operator is not physically present in the vehicle during the testing phase, every state requires Special Approval during Testing. For instance, California and Florida require that autonomous vehicles be operated solely by designees of the manufacturer.⁸ California and Florida have also required any manufacturer to obtain at least \$5 million in insurance coverage, and prohibits testing until the program is approved by California's Department of Licensing.

California is currently going through the rulemaking and public comment process, which manufacturers and Google have actively participated in. Nonetheless, Google has already launched as many as a dozen

⁵ This mandate, however, only relates to suggesting to the Legislature when "large scale production" of these vehicles appears imminent. See HB 1649 § 6(1).

⁶ California SB 1298, http://www.leginfo.ca.gov/pub/11-12/bill/sen/sb_1251-1300/sb_1298_bill_20120925_chaptered.html

⁷ DC Bill <http://dcclims1.dccouncil.us/images/00001/20130110191554.pdf>

⁸ California SB 1298(b)(1), http://www.leginfo.ca.gov/pub/11-12/bill/sen/sb_1251-1300/sb_1298_bill_20120925_chaptered.html

testing vehicles on the California roadways. Google is of the opinion that nothing in the current traffic code precludes it from testing even in the absence of any legislation. We agree that there do not appear to be any affirmative prohibitions on having an automated technology operate the vehicle as long as there is a driver in the driver's seat and the vehicle complies with all other requirements. It is possible that testing under this legal theory is already occurring in Washington and regulators are simply unaware of it. The technology has been actively tested in many states since a 2005 DARPA challenge proposed the idea.

4. Licensing and permitting

Only Nevada, thus far, has required a separate license for the operation of an autonomous vehicle. All states have charged their respective agencies to require at least a valid operator's license prior to operating a driverless vehicle, and require their respective departments to develop regulations. The Washington, D.C. law is the most ambitious, requiring the Mayor's office to issue regulations by January 2014.⁹ California has charged its Department of Motor Vehicles to adopt additional safety standards for operation without an operator in the driver's seat of a driverless vehicle.¹⁰

5. Manual override and "attentive driver" issues

Almost every piece of legislation reviewed by The Clinic requires the technology to enable an operator to take control at a moment's notice. This so-called "manual override" requirement bolsters the tie to personal liability in collisions and violations of the state traffic codes, outlined below. California and Florida even go so far as to specify technical requirements of driverless vehicles.¹¹ However, the Nevada law requires the new license to anticipate that drivers will be operating the driverless vehicle while inattentive. This recognizes the full purpose of driverless vehicles, thereby legally enabling the operator to complete other tasks

6. Criminal and infraction liability

Nearly every approach reviewed places criminal and civil infraction liability on the operator of the vehicle. However, California's SB 1298 is completely silent on the issue of liability, passing that responsibility onto its Department of Motor Vehicles to develop regulations by year 2015. Washington, D.C. and Florida laws provide an exemption to manufacturer liability when a vehicle is outfitted with driverless technology, allowing a case to be dismissed unless the defect was present prior to such an alteration.¹² Washington, D.C. only allows conversions to vehicles of model year 2009 and later.¹³

⁹ DC Bill <http://dcclims1.dccouncil.us/images/00001/20130110191554.pdf>

¹⁰ California SB 1298, http://www.leginfo.ca.gov/pub/11-12/bill/sen/sb_1251-1300/sb_1298_bill_20120925_chaptered.html

¹¹ See Cal. Code §38750(d) *et seq.*, available at <http://www.leginfo.ca.gov/cgi-bin/displaycode?section=veh&group=38001-39000&file=38750>; Fl. Code § 319.45(1) available at <http://www.flsenate.gov/Session/Bill/2012/1207/BillText/er/PDF>;

¹² Florida Bill <http://www.flsenate.gov/Session/Bill/2012/1207/BillText/er/PDF>; DC Bill <http://dcclims1.dccouncil.us/images/00001/20130110191554.pdf>

¹³ DC Bill, <http://dcclims1.dccouncil.us/images/00001/20130110191554.pdf>

7. Civil liability

California's SB 1298 is completely silent on the issue of civil liability in accidents, passing the responsibility on to its Department of Motor Vehicles to develop regulations by 2015. Florida and DC both apply a manufacturer liability exemption provision to civil suits.¹⁴

8. Other unique issues

California requires manufacturers to disclose to purchasers the kind of information collected by driverless vehicles, but no other enacted approach contains a comparable provision.¹⁵ Interestingly, Nevada included its driverless car provisions with a law concerning low emissions automobile and high-occupancy vehicles, perhaps suggesting that they see Driverless Cars as providing environmental benefits.¹⁶

IV. Express Preemption

What international standards or federal laws already exist in this space?

The National Traffic and Motor Vehicle Safety Act (NTMVSA), passed by Congress in 1966, sets out the framework for federal vehicle safety regulation. It empowered the National Highway Traffic Safety Administration (NHTSA) to regulate vehicle safety measures and device requirements and was intended to allow for a uniform system of safety regulation that manufacturers could rely on when designing vehicles. The Act, codified at 49 U.S.C. §30101 et seq., includes a preemption provision that governs courts' analysis of whether a state law is expressly preempted by the Act or NHTSA regulations.¹⁷ However, neither the NTMVSA nor the NHTSA regulations currently speak to autonomous vehicles.

Despite this silence, it is possible that certain elements unique to autonomous vehicles could be considered to fall within categories or definitions that are currently regulated pursuant to the NTMVSA. If a state attempts to regulate an aspect of vehicle performance that is already covered by the NTMVSA or NHTSA regulations, it will be expressly preempted.¹⁸ In theory, many aspects of autonomous vehicle design could be construed as relating to "aspects of performance" governed by the NHTSA regulations. The Second Circuit narrowly construed the regulations,¹⁹ but other courts may construe those or other regulations more broadly, depending on the language used. It is wise to check carefully for any possible construction under which the state regulation would be preempted.

¹⁴ Florida Bill, <http://www.flsenate.gov/Session/Bill/2012/1207/BillText/er/PDF>

¹⁵ California SB 1298, http://www.leginfo.ca.gov/pub/11-12/bill/sen/sb_1251-1300/sb_1298_bill_20120925_chaptered.html

¹⁶ AB 511 http://www.leg.state.nv.us/Session/76th2011/Bills/AB/AB511_EN.pdf

¹⁷ The relevant language provides that "[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 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." 49 U.S.C. §30103(b).

¹⁸ The aspects of vehicle performance addressed by the NTMVSA include tire performance, 49 U.S.C. §30123; rollover prevention and crash mitigation, §30128; bumper sufficiency, ch. 325; fuel economy, ch. 329; and theft prevention systems, ch. 331. NHTSA regulations currently extend to safety equipment; crash avoidance systems like brakes, mirrors, seats, and restraints; and impact mitigation designs.

¹⁹ *Chrysler v. Tofany*, 419 F.2d 499, 511 (2d Cir. 1969) (holding that state laws granting state commissioners the power to deny drivers the ability to add an external automobile light were not preempted by NHTSA regulations on external lighting).

Notably, a state can require safety standards greater than those required by the NTMVSA and its attendant regulations for vehicles “obtained for its own use.” This is important, because even if the NHTSA does regulate autonomous vehicle safety requirements, a state could purchase autonomous vehicles for its own use and then require them to meet more strenuous standards. This would be useful if a state wanted to develop a pilot program featuring state-owned vehicles.

Traffic control devices like roadway signage and traffic lights are subject to express federal regulation.²⁰ State law altering the use of any traffic control devices mentioned in the federal regulation would be preempted, but use of traffic control devices not mentioned may be allowed.²¹ If a state feels it wise to introduce assistive devices of some sort for autonomous vehicles, there may be some room to add them unless the Federal Highway Administration (FHWA) weighs in on the matter

Although the NHTSA has not released formal rules concerning driverless cars, they introduced recommendations at the a hearing of House Committee on Transportation and Infrastructure Subcommittee on Highways and Transit on How Autonomous Vehicles Will Shape the Future of Surface Transportation. This November 19, 2013 hearing included written testimony from NHTSA Administrator David L. Strickland. In his testimony, he outlined the familiar five levels of automation that the NHTSA has stressed, along with new recommendations for how states should begin the testing phase of this technology. The Clinic has analyzed the current implementation of the NHTSA suggestions by the states. After the introduction of these NHTSA suggestions, we believe it is likely the NHTSA will introduce formal rules governing autonomous technology in the near future.

V. Recent Federal Actions: NHTSA Proposal

State-level action must account for the landscape of federal regulation. To that end, we summarize here the most recent (2013) statement by the NHTSA:

Summary of NTHSA’s Public Statement

Basic concerns:

It is premature to recommend that states permit operation of AV for purposes other than testing, which should assume the presence of a human driver from the institution or its agent engaged in testing. The major timing concern appears to be balancing concerns about safety with the potential that premature regulation may put the brakes on the rapid development of a promising technology.

1. Licensing

NHTSA proposes endorsements or separate driver’s license for AV operators, as well as a complete training course or certification from manufacture. Training materials should be submitted to and approved by submit training material to the state agency

²⁰ See *Manual on Uniform Traffic Control Devices for Streets and Highways*, <http://mutcd.fhwa.dot.gov>

²¹ 23 CFR 655.603(a).

2. Risk management for other road users

State regulation should be used to minimize risks to other road users, and should consider: miles in self-driving mode without incident; data from previous testing; a business and risk-management plan submitted to the state regulatory body; and the presence of properly licensed drivers ready to take control of AV.

3. Limitations in testing condition

AV operators should inform the state about the operating conditions in which manufacturers wish to test, with data to support the safety of operation under those conditions. Operators should limit the use of the self-driving mode to conditions conducive to safe operation in that mode, and otherwise limit operating conditions (e.g., limited access highway).

4. Reporting requirement

AV operators should report all crashes or near-crashes with the state agency, and also any system failure that required a driver to take control of the AV.

5. Transitioning from self-driving mode to driver control

AV operators should maintain driver's readiness to transition, emphasize a technological requirement that such transition is immediate, and provide for priority on manual control and alerts for transition events.

6. Capabilities regarding system failure

Vehicles should have on-board capability of detecting system failure, mitigating consequences, and recording system failure.

7. Federal requirements

Automated vehicles must not disable, make inoperative, or degrade the performance of any federally required safety system. State certification requirements should ensure that AV's satisfy federal requirements.

8. Data management

AV's should record all data, including data at the time of any crash or incident, and make all data available to the state regulatory agency.

VII. Recommendations

Our recommendations are for three stages of legislation, with the first stage being our immediate recommendation, and stages two and three available at some point in the future. The exact timing for stages two and three will depend on the results of testing autonomous vehicles in Washington and the path the advancement of autonomous driving technology takes over time.

Stage One: Testing

Stage One, our immediate recommendation, is for the Washington Legislature to enact new laws allowing testing of driverless vehicles in Washington. The basis for this legislation could be the

enactment of House Bill 1439, first read on January 28, 2013. Whether the basis of the new legislation is House Bill 1439, or a new bill, it should contain the following provisions:

- 1) Only manufacturers can test/use autonomous vehicles in the state of Washington
- 2) Manufacturers must post a liability bond in the amount the legislature deems sufficient
- 3) All autonomous vehicles must meet certain safety standards
- 4) All autonomous vehicles can only be driven with a capable, trained person in the front seat, able to regain control of the vehicle quickly if needed
- 5) All autonomous vehicles must meet certain efficiency/emissions standards
- 6) A government agency or other capable organization is given responsibility for oversight and implementation of any enacted legislation governing autonomous vehicles

Stage Two: Specific Licensing

Stage Two would allow for special use of autonomous vehicles by non-manufacturer parties deemed to have special need or special capability which would justify their use of an autonomous vehicle. Such parties would/could include:

- 1) Designated Government workers running public transportation or other government services
- 2) Individuals with specific disabilities, which prevent them from driving
- 3) Other parties the legislature deems responsible

Stage Three: Expanded use

Stage Three would allow members of the public to obtain licenses permitting their use of autonomous vehicles for general driving purposes, with requirements as the legislature deems suitable to prevent misuse. We anticipate that the following issues will require legislative action to enact stage 3:

- Detailed regulation that is needed for premature technology, such as the minimum miles requirement in Nevada, can limit innovation and may be inappropriate for mature technologies. Such requirements will need to be rolled back at Stage 3.
- State codes should be standardized regarding requirements of AV operation for public safety, in order to provide market certainty and to promote innovation and deployment of pro-safety technologies purpose (following the examples of Washington D.C. and Michigan)
- Common rules on active reporting requirements will be necessary to protect future users of autonomous vehicle (policies adopted by all five current testing jurisdictions)

The specific nature of standardized laws and regulations should remain open to debate pending the further development of autonomous vehicles.