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I. INTRODUCTION TO AUTONOMOUS VEHICLES

The dawn of a new era of transportation is upon us. Cars that drive themselves are no longer relegated to our imaginations and science-fiction movies. Automobile companies like Tesla and Volvo, as well as search-engine giant Google, are rolling out new features that take over the duties previously charged to the driver of a vehicle.[1] Since October 2014, all of Tesla's vehicles come standard with hardware for their Autopilot feature.[2] Tesla's Autopilot feature, which requires an up-charge of $2,500 for activation,[3] includes capabilities such as blind spot warnings, automatic braking, and lane switching.[4] A further update to the Autopilot software added a capability that Tesla refers to as "Summon," which, when activated, will induce the car to exit a parking space on its own, without a driver inside the car, and approach its nearby owner,[5] like a personal, built-in valet.

Tesla's Autopilot feature also possesses the ability to do the driving for its passengers.[6] The operator of a Tesla can allow the car to take over the driving at speeds above 18 miles per hour.[7] This technology was recently used by a group of three on a cross-country trip from New York City to Redondo Beach, California, that took just under a mere fifty-eight

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1. Markos Moulitsas, *Whether It's Faraday, Tesla, or Volvo, Our Electric Self-Driving Car Future Is Closer Than Ever*, DAILY KOS (Jan. 6, 2016, 12:02 PM PST), http://www.daily kos.com/story/2016/1/6/1466657/-Whether-it-s-Faraday-Tesla-or-Volvo-our-electric-self-driving-car-future-is-closer-than-ever.

2. Cadie Thompson, *7 Incredible Things Tesla's Cars Can Now Do on Autopilot*, TECH INSIDER (Jan. 11, 2016, 2:24 PM), http://www.techinsider.io/7-incredible-tesla-autopilot-features-2016-1.

3. *Id.*

4. *Id.*

5. *Id.*

6. Alex Davies, *Obviously Drivers Are Already Abusing Tesla's Autopilot*, WIRED (Oct. 22, 2015, 7:00 AM), http://www.wired.com/2015/10/obviously-drivers-are-already-abusing-teslas-autopilot/.

7. *Id.*

hours.[8] Autopilot was engaged during ninety-six percent of the trip.[9] Despite the car's ability to stay in the lanes on its own, the driver must touch the steering wheel every few seconds or else the car will signal a warning and eventually come to a controlled stop.[10] Tesla CEO Elon Musk has stated, "[w]e tell drivers to keep their hands on the wheel just in case, to exercise caution in the beginning."[11]

Although Tesla's current stance is to implore drivers to stay relatively alert while using Autopilot, undoubtedly, it will not be long before driver attention is not required at all. In fact, Google is developing a line of self-driving cars that does not even permit its human passengers to drive.[12] The electrically-powered vehicle contains no steering wheel and no brake pedals.[13] The only control that a passenger possesses in Google's revolutionary vehicle is a red emergency stop button.[14]

Tesla's Model S, the company's cheapest currently available model, starts at $75,000 before tax-incentives[15] (the federal government and many state governments give tax credits to buyers of low-emission vehicles[16]), so by no means are its Autopilot features widely available to the public. However, on March 31, 2016, Tesla unveiled its Model 3.[17] Like Tesla's other vehicles, the Model 3 comes standard with Autopilot hardware.[18] Starting at $35,000 before tax incentives,[19] the Model 3 is being billed as Tesla's mass-market car.[20] Within twenty-four hours of the Model 3's unveiling, Tesla already had 232,000 preorders for the car (most having come in prior to the unveiling).[21] Though the Model 3 is not slated for production until late 2017,[22] it is clear that cars with autonomous driving

8. Davies, *supra* note 6.

9. *Id.*

10. *Id.*

11. *Id.*

12. John Markoff, *Google's Next Phase in Driverless Cars: No Steering Wheel or Brake Pedals*, N.Y. TIMES (May 27, 2014), http://www.nytimes.com/2014/05/28/technology/googles-next-phase-in-driverless-cars-no-brakes-or-steering-wheel.html.

13. *Id.*

14. *Id.*

15. TESLA, https://www.teslamotors.com/models/design?source=models-features1 (last visited Apr. 5, 2016).

16. PLUG IN AMERICA, http://www.pluginamerica.org/incentives (last visited Apr. 5, 2016).

17. Jordan Golson, *Tesla Model 3 Announced: Release Set for 2017, Price Starts at $35,000*, THE VERGE (Mar. 31, 2016, 11:58 PM), http://www.theverge.com/2016/3/31/11335272/tesla-model-3-announced-price-release-date-specs-preorder.

18. *Id.*

19. *Id.*

20. Dana Hull, *Musk Unveils Tesla's $35,000 Model 3 in Push for Mass Market*, BLOOMBERG (Mar. 31, 2016, 9:22 PM PST), http://www.bloomberg.com/news/articles/2016-04-01/musk-unveils-tesla-s-35-000-model-3-in-push-for-mass-market.

21. Richard Lawler, *Tesla's Model 3 has already racked up 232,000 pre-orders*, ENGADGET (Apr. 1, 2016), http://www.engadget.com/2016/04/01/teslas-model-3-has-already-racked-up-232-000-pre-orders/.

22. Golson, *supra* note 17.

capabilities are coming fast and will be here to stay.

While some may bemoan the coming of a Terminator-*esque* world ruled by computers, taking organic life forms out of the driving equation will actually benefit modern-day society in ways probably unimaginable a generation ago. The first benefit of a life where cars drive themselves that may come to mind for American workers is the ability to kick back and read the news during the morning commute, to recline the "driver's" seat on the way home to steal a few minutes of shut eye. Undoubtedly, that scenario sounds appealing to practically anyone who drives to work or who has been stuck in a traffic jam.

One of the greatest benefits autonomous vehicles ("AVs") will bestow upon us, however, is their safety. Roughly 33,000 people die in traffic accidents every year in the United States.[23] From the time that Google started its AV program in 2009 until July 2015, the tech giant's intelligent four-wheelers logged 1.2 million hours on the road.[24] During that period of time, Google's AVs were involved in only fourteen accidents.[25] All fourteen of those accidents were caused by human error — not flaws in the technology.[26]

Beyond safety, cars that can drive themselves and that also communicate with other vehicles on the road will increase our traffic efficiency. Connected and automated driving technologies will allow vehicles to drive closer to each other without sacrificing safety.[27] This will increase roadway capacity due to the reduction of wasted space between vehicles.[28] Furthermore, these technologies will reduce the need for space-consuming safety barriers and roadway signs, thus increasing efficiency and aesthetics.[29]

Notwithstanding the various benefits to convenience, safety, and efficiency that AVs will bestow upon us, there are many people in various industries who are sweating this impending driving revolution. As AVs reduce the number and severity of automobile accidents, they will moreover reduce the need for automobile insurance coverage.[30] In fifteen

23. Jemima Kiss, *Self-Driving Cars: Safe, Reliable – But A Challenging Sell for Google*, THE GUARDIAN (Oct. 6, 2015), http://www.theguardian.com/technology/2015/oct/06/google-self-driving-car-jemima-kiss.

24. *Id.*

25. *Id.*

26. *Id.*

27. John McCarthy et al., *Connected & Autonomous Vehicles: Introducing the Future of Mobility* 6, ATKINS, http://www.atkinsglobal.com/~/media/Files/A/Atkins-Corporate/uk-and-europe/uk-thought-leadership/reports/CAV_A4_digital_250915_FINAL.pdf.

28. *Id.*

29. *Id.*

30. Noah Buhayar & Peter Robison, *Can the Insurance Industry Survive Driverless Cars?*, BLOOMBERG BUSINESSWEEK (July 30, 2015, 2:00 AM PDT), http://www.bloomberg.com/ news/articles/2015-07-30/can-the-insurance-industry-survive-driverless-cars-.

years, insurance premiums could drop by as much as sixty percent.[31] As the car insurance industry collected roughly $195 billion in premiums in 2014 from drivers in the U.S.,[32] AVs could cost the industry more than $100 billion per year.

The implications to the insurance industry of the widespread use of AVs go even further than this. Volvo's CEO, Håkan Samuelsson, has stated that his company will accept full liability when their cars are used in autonomous mode.[33] Whether all producers of AVs will take this same stance is unclear at this time. But if future changes in automobile regulation allow for car companies to provide insurance coverage en masse for the drivers of their cars, the insurance companies will very likely be at a great disadvantage at the negotiation table relative to their position today when dealing with individual policy holders.

AV producers are also concerned about the current lack of regulation of AVs in the United States.[34] Samuelsson has urged regulators to work with automakers in order to solve controversial legal issues surrounding AVs, including that of liability.[35] He has stated that "[t]he U.S. risks losing its leading position due to the lack of federal guidelines for the testing and certification of autonomous vehicles."[36] But, as the numerous state and local governments are generally in charge of regulating driver behavior on public streets,[37] there is not a uniform set of rules to play by.

Given the uncertain nature of future legal liability and regulation of AVs, it is imperative that we establish a liability and regulatory framework so that automakers can continue to make advances in the field and consumers can know what to expect when operating their vehicles. Accordingly, this Note will discuss various options for future AV liability and regulatory challenges, and ultimately will outline a recommendation that will involve coordination between the federal and state governments, as well as private legal organizations.

Working in concert, the National Highway Traffic Safety Administration ("NHTSA"), the states, and a new, AV-specific independent legal committee similar to the Permanent Editorial Board ("PEB") for the Uniform Commercial Code ("UCC") should regulate AVs through the introduction of NHTSA-required monitoring hardware and broad state adoption of a UCC-*like* common set of AV regulations which

31. *Id.*

32. *Id.*

33. Kirsten Korosec, *Volvo CEO: We Will Accept All Liability When Our Cars Are in Autonomous Mode*, FORTUNE (Oct. 7, 2015, 3:34 PM EDT), http://fortune.com/2015/10/07/volvo-liability-self-driving-cars/.

34. *Id.*

35. *Id.*

36. *Id.*

37. Stephen P. Wood et al., *The Potential Regulatory Challenges of Increasingly Autonomous Motor Vehicles*, 52 SANTA CLARA L. REV. 1423, 1498 (2012).

would impute absolute liability on automakers for accidents and violations caused by their autonomous technology.

II. LIABILITY ISSUES AND REGULATORY OBSTACLES

A. HOW DO AVS WORK?

AVs rely on a symphony of technologies in order to drive themselves. Google's driverless cars have eight sensors.[38] One of those sensors is called a Lidar, which is a camera that uses an array of either thirty-two or sixty-four lasers to measure the distance to objects in order to create a three-dimensional map at a range of 200 meters, allowing the car to detect hazards.[39] Radars mounted to the bumpers keep track of vehicles in front of and behind the car.[40] An ultrasonic sensor on one of the rear wheels monitors the car's movements.[41] The vehicle receives GPS information from a satellite but also contains altimeters, gyroscopes, and a tachometer for more precise measurements of its location.[42]

The information gathered by the various sensors is then interpreted by the vehicle's software, which can accurately identify other road users and their behavior patterns, as well as commonly used highway signals.[43] While certain behaviors are hard-coded into the car, such as stopping at red lights, other behaviors are learned based on previous driving experiences.[44] Google's AV learning algorithm processes the data of all of their AVs in order to find an appropriate response to each possible problem.[45] The AVs understand, for instance, that another driver's likelihood to pass a slow-moving vehicle in the right lane means that a car following behind it is more likely to attempt a pass; or, a pot hole in the street indicates a higher probability that a driver will swerve to avoid it.[46] Furthermore, Google's AVs don't just use Google Maps for navigation — the AVs utilize maps that are detailed down to the height of the curbs and the dimensions of the lanes.[47] Despite all of the impressive technology, the cars still have problems dealing with snow, ice, and heavy rain.[48] However, in years to

38. Paul Hood, *How Do Google's Self-Driving Cars Work?*, ALPHR (Apr. 4 2016), http://www.alphr.com/cars/7038/how-do-googles-self-driving-cars-work.

39. *Id.*

40. *Id.*

41. *Id.*

42. *Id.*

43. *Id.*

44. Bryan Clark, *How Self-Driving Cars Work: The Nuts and Bolts Behind Google's Autonomous Car Program*, MAKEUSEOF (Feb 21, 2015), http://www.makeuseof.com/tag/how-self-driving-cars-work-the-nuts-and-bolts-behind-googles-autonomous-car-program/.

45. *Id.*

46. Clark, *supra* note 44.

47. *Id.*

48. *Id.*

come, once the technology has matured and the last major technological hurdles have been overcome, "autonomous vehicle" is sure to become synonymous with "automobile."

B. WHO SHOULD BE LIABLE FOR ACCIDENTS CAUSED BY AVS?

1. The Current Tort Law Framework of Liability

The current framework for automobile liability in the U.S. is predicated, generally, on the principles of tort law and insurance law. When a person commits an unintentional tort by accidentally crashing a car into someone else's car, the standard of negligence determines liability.[49] To win on a claim for negligence, a plaintiff must first establish that the defendant owed the plaintiff a duty.[50] Next, the plaintiff must demonstrate that the defendant breached that duty.[51] After that, the plaintiff must prove that the defendant's actions that constituted the breach were the proximate cause of the plaintiff's injury.[52] Finally, the plaintiff must establish that she did, indeed, incur damages.[53]

A typical automobile insurance contract contains coverage for various different occurrences.[54] Some of these various types of coverage are "first-party" coverage, meaning that they give the insured a claim directly against her insurer.[55] Some of the "first-party" types of coverage are: comprehensive (for damage not caused by a collision, like falling objects and theft), collision, medical payments, and uninsured or underinsured motorists (referring to third parties).[56] The insurance contracts also provide that the insurance company will defend claims by third parties seeking liability against the policyholder and will settle those claims when it sees fit.[57]

While the tandem of tort law and individual automobile insurance policies work well for conventional cars with human drivers, they do not work very well when it comes to AVs, for reasons relating to both law and policy. First, if the operator of an AV activates her car's autonomous driving feature and sets her destination with a few taps of a touch-screen, then sits back and allows the car to drive itself, can she be deemed to have

49. W. PAGE KEETON ET AL., PROSSER AND KEETON ON THE LAW OF TORTS 161–64 (W. Page Keeton ed., 5th ed. 1984).

50. *Id.* at 164.

51. *Id.*

52. *Id.* at 165.

53. *Id.*

54. Robert W. Peterson, *New Technology-Old Law: Autonomous Vehicles and California's Insurance Framework*, 52 SANTA CLARA L. REV. 1341, 1352 (2012).

55. *Id.*

56. *Id.*

57. Peterson, *supra* note 54, at 1353.

breached her duty of care to the other motorists if the AV makes a mistake and crashes into another car? Courts in many states today might say "yes," as most, if not all, states without AV legislation have reckless driving laws that require drivers to pay attention to the road. However, if states continue to require "drivers" to pay attention to the road while their cars are in autonomous mode, the very crux of the benefit of AVs is totally eliminated.

Inevitably, with further advancement of AV technology, the states will permit "drivers" to completely detach from the actual driving of the vehicle and allow the AV to take over altogether. But at that point, if the current framework of tort law still governs, many consumers will certainly be apprehensive about AV technology. After all, why should the operator of an AV be liable for a mistake that the AV makes? Beyond that, if the states do allow for the operator of an AV to stop paying attention to the road, then can it be proven in court that the operator breached her duty if the AV causes an injury? Could the operator's actions be deemed the proximate cause of an injury when the operator was not actually required to do anything? Additionally, some AV manufacturers have already stated that they want to take liability for the mistakes that their AVs make[58] — so, why not give it to them?

2. Products Liability

Products liability law might seem a natural fit to succeed the current unintentional tort framework as the governing doctrine for automobile accidents in an era when AVs are the norm. AVs are, in fact, products and when they cause automobile accidents, they likely have some technological defect, whether it is in the code making up the software element of the technology or a physical component of its hardware. Products liability would also impute liability upon the manufacturer of the vehicle, rather than the operator of the vehicle. Furthermore, there is already a wealth of precedent for using products liability law to find an automaker liable for defects in automobiles that malfunction and cause injury.

In general, a defendant can be found liable under products liability doctrine for injury caused to a plaintiff by the defendant's product if, at the time of sale or distribution, the product had a defect that falls into one of three categories.[59] In the first category, a product contains a manufacturing defect when the product departs from its intended design.[60] For instance, if a particular airplane requires a wingspan of fifty feet in order to fly safely, and the blueprints for the airplane specified a wingspan of fifty feet, but a flawed manufacturing process led to the airplane having a forty-nine-foot

58. Korosec, s*upra* note 33.
59. *See generally*, RESTATEMENT (THIRD) OF TORTS: PROD. LIAB. § 2 (AM. LAW INST. 1998).
60. *Id.* at § 2(a).

wingspan, that airplane has a manufacturing defect.

In the second category, a product contains a design defect when the foreseeable risks of harm posed by the product could have been reduced or avoided by the adoption of a reasonable alternative design, and the design that was actually used renders the product not reasonably safe.[61] Using the airplane example again, if a particular airplane requires a fifty-foot wingspan in order to fly safely, but the blueprints for the airplane specify a forty-nine-foot wingspan, the airplane built to the specifications laid out in the blueprints has a design defect.

Finally, in the third category, a product has an inadequate warning defect if the product lacks instructions or warnings when the foreseeable risks of harm posed by the product could have been reduced or avoided by the provision of reasonable instructions or warnings, and without the warning the product is not reasonably safe.[62] Thus, if it is unsafe to operate a particular single-seat airplane if the pilot weighs more than 400 pounds, but the airplane comes with no warning to that effect, that airplane has a warning defect.

After making a finding of product defect, courts across the country have used both the negligence standard and the standard of strict liability as theories of recovery.[63] While negligence focuses on the conduct of the manufacturer, strict liability focuses on the product.[64] Strict liability's product-focus may help make the point to a jury that the defendant is held to an expert standard of knowledge for the given industry[65] (rather than to a standard of what was reasonable for that manufacturer to do) and, therefore, may be considered more consumer friendly.

Regardless of whether the negligence standard or the strict liability standard is applied, however, a plaintiff must prove that a product is defective in order to recover under products liability law — a burden, likely, too great on a plaintiff for the purpose of determining liability for a minor car accident. Products liability lawsuits are typically expensive and complex.[66]

Imagine, for instance, that an AV causes an accident and a few thousand dollars' worth of damage due to a minor flaw in the car's software code, and after thorough investigation, it is found that there is nothing wrong with any of the physical aspects of the vehicle (cameras and sensors that the AV technology relies on, as well as the more conventional car parts). Most likely, the plaintiff's only option would be to sue the car company under the design defect theory of products liability, asserting that

61. *Id.* at § 2(b).
62. *Id.* at § 2(c).
63. *Id.* at § 1 cmt. a.
64. *Id.*
65. RESTATEMENT, *supra* note 59, at § 1 cmt. a.
66. Peterson, *supra* note 54, at 1355.

the software is dysfunctional. This would require the plaintiff to locate and prove a flaw in the code of the software, a task that would be extremely costly and would likely outweigh the benefit of pursuing the suit by several orders of magnitude, if even possible. Though products liability law has its place in the automobile liability world, it is not the right doctrine to govern everyday fender benders.

3. Absolute Liability When at Fault

If the current tort framework does not work for accidents caused by AVs because the operator of the vehicle does not actually drive, and products liability law does not make sense due to complexity and economic burden of litigation, then absolute liability imputed upon the automaker for accidents caused by AVs might be the best option. The idea of transitioning from driver tort liability to automaker absolute liability may seem akin to a legal seismic shift. Though the suggestion may raise some eyebrows, there is actually some precedent for the move.

The Federal Safety Appliance Act ("FSAA") requires railroads to maintain certain railroad equipment to a level consistent with prescribed conditions.[67] The FSAA imposes absolute liability upon a railroad for injuries sustained by an employee when the automatic couplers (the devices that hold the train cars together) fail to perform properly.[68] Therefore, in personal injury claims introduced for injuries caused by a violation of the FSAA, care on the part of the railroad is, generally, immaterial.[69] However, if the plaintiff's negligence was the sole cause of the injury, then the statutory violation could not have contributed even in part to the injury, and absolute liability will not attach.[70] Thus, when a railway employee is hurt when the automatic couplers fail to perform correctly, the railroad company will be liable for the employee's damages no matter how much care the company took, as long as it cannot be proven that the employee's injury stemmed one hundred percent from her own negligence.

Though the situations are not perfectly analogous, this railroad model of absolute liability for automatic coupler failures might make the most sense when it comes to attributing liability when AVs fail to perform safely. Absolute liability places the liability where it should be — on the maker of the technology — while not requiring a finding of a product defect. Of course, absolute liability would only attach when it is found that the AV was at fault for the accident.

Most frustrating to the adoption of a new framework for automobile

67. Magelky v. BNSF Ry. Co., 491 F. Supp. 2d 882, 888 (D.N.D. 2007).
68. *Id.* at 890.
69. *Id.* at 888–89.
70. *Magelky*, 491 F. Supp. 2d at 889 (internal citations omitted).

accidents, however, is not locating the most appropriate doctrine of law but rather finding a way to institute that doctrine uniformly across the many states and localities that comprise this country, so that all producers of AVs and all consumers of those vehicles can play by the same set of rules regardless of their area codes.

C. THE PROBLEM WITH PATCHWORK STATE REGULATION

Florida, California, Nevada, and Michigan were the first four states to pass AV legislation.[71] In 2015, North Dakota and Tennessee joined their ranks, and several other states have introduced new bills this year.[72] Washington, D.C. has also passed AV laws.[73] While the adoption of AV legislation by these states and the nation's capital, representing more than twenty-four percent of the licensed drivers in the United States,[74] is encouraging for the AV industry, the patchwork approach leaves much to be desired.

While the many states may have slightly different definitions of the duty of care that an operator of a vehicle must maintain, it is not important for a driver to understand the subtle differences when driving across state lines. After all, most drivers are going to exercise a degree of care, in the interest of their own safety, that will satisfy the local requirements. The differences, and absences, in state laws regarding AVs, however, pose a major dilemma.

Washington, D.C.'s AV legislation defines an AV 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."[75] The law further provides that AVs may be operated on public roadways under three conditions.[76] The first condition is that the vehicle has a manual override that allows the operator of the vehicle to assume control of the AV at any time.[77] Second, the operator must be seated in the control seat of the AV while in operation and must be prepared to take control of the AV at any moment.[78] Finally, the AV must be capable of operating in compliance with Washington, D.C.'s traffic and motor vehicle

71. John W. Terwilleger, *Navigating The Road Ahead: Florida's Autonomous Vehicle Statute and Its Effect on Liability*, 89 FLA. B.J. 26, 27 (2015).

72. *Autonomous/Self-Driving Vehicles Legislation*, NATIONAL CONFERENCE OF STATE LEGISLATURES, http://www.ncsl.org/research/transportation/autonomous-vehicles-legislation.aspx (last visited Apr. 5, 2016).

73. *Id.*

74. STATISTA, *Total Number of U.S. Licensed Drivers By State*, http://www.statista.com/statistics/198029/total-number-of-us-licensed-drivers-by-state/ (last visited Apr. 5, 2016).

75. D.C. CODE § 50-2351(1) (2013).

76. *See generally*, D.C. CODE § 50-2352 (2013).

77. D.C. CODE § 50-2352 (1) (2013).

78. D.C. CODE § 50-2352 (2) (2013).

laws as well as its traffic control devices (e.g., stop lights).[79]

Meanwhile, a bill passed in Nevada generally banning the use of a cell phone for texting while operating a motor vehicle, explicitly excepts operators of "motor vehicle[s] driven autonomously through the use of artificial-intelligence software and [when] the autonomous operation of the motor vehicle is authorized by law."[80] Would an AV operator composing a text message on her phone be deemed "prepared to take control of the autonomous vehicle at any moment" under the D.C. law? If, hypothetically speaking, Virginia passed a law that allows operators of AVs to do anything they want, including sleep, while their AV drives itself, a person taking a nap while travelling from Virginia to D.C. in her AV would need to make sure to wake up before crossing the state line in order to avoid violating D.C. law.

Once AVs are the norm, the discrepancies amongst state laws could create a logistical nightmare not only for regular people travelling across state lines, but for the trucking industry which is likely to fully embrace AV technology. Daimler AG, the corporation that owns Mercedes-Benz, is already developing an autonomous driving eighteen-wheeler.[81] In 2012, nearly 4,000 people were killed in accidents with large trucks, most of them in passenger cars.[82] Driver error caused about ninety percent of those deaths.[83] Taking over-worked truck drivers out of the truck-driving equation will benefit road safety, but will also be good for trucking companies' bottom lines. The benefits might not be fully realized, however, if trucking companies cannot use AVs for long hauls due to the various, disparate requirements for their use in each state.

D. FEDERAL REGULATION

Though the federal government cannot compel the states to adopt uniform AV legislation, it can help to bridge some of the gaps. The National Highway Traffic Safety Administration ("NHTSA") was established by the Highway Safety Act of 1970.[84] The NHTSA is an agency of the U.S. Department of Transportation[85] and should play a critical role in the establishment of AV standards.

In 1966, Congress enacted the National Traffic and Motor Vehicle

79. D.C. CODE § 50-2352 (3) (2013).

80. NEV. REV. STAT. § 484B.165(7) (2015).

81. Alex Davies, *The World's First Self-Driving Semi-Truck Hits the Road*, WIRED (May 5, 2015, 7:41 PM), http://www.wired.com/2015/05/worlds-first-self-driving-semi-truck-hits-road/.

82. *Id.*

83. *Id.*

84. NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION, http://www.nhtsa.gov/About (last visited Apr. 5, 2016).

85. *Id.*

Safety Act.[86] The amended act is currently codified as 49 U.S.C. §§ 30101 et seq., and its stated purpose is "to reduce traffic accidents and deaths and injuries resulting from traffic accidents."[87] Section 30101 vests in the NHTSA authority to "prescribe motor vehicle safety standards for motor vehicles and motor vehicle equipment in interstate commerce"[88] and "to carry out needed safety research and development."[89] So, the NHTSA can set performance standards to which manufacturers of motor vehicles and motor vehicle equipment must conform.[90] The NHTSA does not regulate the actions of automobile owners nor how automobiles may be operated on public streets.[91] Moreover, the NHTSA cannot require individual car owners to retrofit their cars with new equipment.[92] The NHTSA has authority, however, to require manufacturers to install certain types of equipment on vehicles and to set performance standards for that equipment.[93] One such example was when the NHTSA mandated and set standards for antilock brakes in air-braked vehicles.[94]

Though only a decade or so ago it may have seemed like fantasy, it now seems inevitable that in coming years, the NHTSA may require cars to be built with AV technology. Children born today may never get to experience driving a car. Once the multitude of benefits of AV technology are realized, it is not out of the question that the NHTSA may ban the installation of human-operated instruments in cars.

In January of this year, U.S. Transportation Secretary Anthony Foxx revealed that the Obama Administration intends to invest nearly $4 billion over ten years to accelerate the development and adoption of safe vehicle automation.[95] The investment would fund pilot programs to test vehicle systems and work with industry leaders to encourage a multistate framework for AVs and connected vehicles.[96] AV manufacturers were undoubtedly pleased to hear Secretary Foxx's announcement, as it is a clear indication that the federal government is interested in advancing the development and regulation of AVs. However, the federal government is limited in its ability to influence policy in the states, and the country is still far from a comprehensive plan for the regulation of AVs.

86. Wood et al., *supra* note 37, at 1434.
87. *See generally*, 49 U.S.C. § 30101 (1994).
88. 49 U.S.C. § 30101(1) (1994).
89. 49 U.S.C. § 30101(2) (1994).
90. Wood et al., *supra* note 37, at 1435.
91. *Id.*
92. *Id.* at 1436.
93. *Id.* at 1450.
94. Washington v. Dept. of Transp., 84 F.3d 1222, 1223 (10th Cir. 1996).
95. Press Release, National Highway Traffic Safety Administration, *Secretary Foxx unveils President Obama's FY17 Budget Proposal of Nearly $4 Billion for Automated Vehicles and Announces DOT Initiatives To Accelerate Vehicle Safety Innovations* (Jan. 14, 2016), http://www.nhtsa.gov/About +NHTSA/Press+Releases/dot-initiatives-accelerating-vehicle-safety-innovations-01142016.
96. *Id.*

III. MY RECOMMENDATION

A. PLAN OVERVIEW

Creating a national framework for AVs by instituting regulations that provide for a uniform set of rules across the states regarding issues such as, but not limited to, liability when AVs cause accidents, is a great endeavor. The obstacles, as outlined above, are numerous. A regulatory plan that works will, indubitably, require efforts by and coordination between the states, the federal government, and various independent entities. Accordingly, my plan will borrow from a previous successful joint-state endeavor, the UCC, in order to enact a policy of absolute liability, similar to that employed by the federal government in the FSAA, and will call upon the NHTSA for support in requiring new AVs to be outfitted with devices that will simplify the finding of fault when AVs cause accidents.

B. BORROWING FROM THE UCC

The UCC is a comprehensive modernization of various laws that govern commercial transactions.[97] In 1944, the American Law Institute ("ALI") and the National Conference of Commissioners on Uniform State Laws ("NCCUSL") teamed up to work on the Commercial Code Project, which eventually became the UCC.[98] An Editorial Board was created to coordinate the project, and that eventually evolved into the Permanent Editorial Board ("PEB").[99] The PEB now assists in attaining and maintaining uniformity in state statutes governing commercial transactions.[100] It does this both by discouraging nonuniform amendments to the UCC by the states and by approving and promulgating amendments to the Code.[101] The UCC has been adopted in 49 of the 50 states, as well as Washington, D.C. and the Virgin Islands.[102]

Following this model, the ALI, NCCUSL, or a new, independent body of legal minds from the AV industry with representatives from all or many of the states and the major AV producers, should form an editorial board and draft a proposed uniform AV code intended for adoption by all fifty of

97. *Uniform Commercial Code UCC*, AMERICAN LAW INSTITUTE, https://www.ali.org/publications/show/uniform-commercial-code/ (last visited Apr. 5, 2016).

98. Permanent Editorial Board For The Uniform Commercial Code, *Agreement Describing the Relationship of The American Law Institute, the National Conference of Commissioners on Uniform State Laws, and the Permanent Editorial Board with Respect to the Uniform Commercial Code*, https://www.ali.org/media/filer_public/54/d2/54d2249e-61df-4c33-bba7-b539bf8a5b99/agreement-peb-ucc.pdf.

99. *Id.*

100. *Id.*

101. *Id.*

102. *Id.*

the United States and Washington D.C. The editorial board's main goal after drafting the legislation will be to encourage the states to adopt the law. Then, from time to time, the editorial board can make amendments to the uniform AV code in order to keep it abreast of changing circumstances and new technology, as the PEB does for the UCC. The editorial board will also be responsible for helping to maintain uniformity among the states by discouraging amendments contrary to the uniform AV code. Finally, the editorial board will be the voice for the AV industry when it comes to communicating with the NHTSA to encourage or discourage changes to federally required safety standards and technology.

C. LIABILITY

The editorial board will have a lot of information and options to parse through when developing the uniform AV code, most of which is outside the scope of this discussion. However, in terms of liability when AVs cause accidents, the uniform AV code should impute automakers with absolute liability. Absolute liability for the manufacturer when an AV causes an accident makes more sense than a products liability approach or the current approach used in most automobile accidents.

The current framework imputes the operator of a vehicle with tort liability when that vehicle is the cause of an accident. This makes sense because the operator of the vehicle is responsible for controlling all of the vehicles movements. That is not true, however, for AVs. At the point when AV technology is good enough so that operators of vehicles no longer need to be aware of what is happening on the road, it is illogical to use the standard of negligence to determine liability. Also, a number of automakers have stated that they want to take legal responsibility for the mistakes that their AVs make, undoubtedly because that will be a necessary step for consumers to have confidence in those products. Thus, it is crucial that we move away from the current framework.

Products liability doctrine, though seemingly suited for this purpose, is overly costly and complex for the majority of automobile accidents. Proving a product defect is far too great of a burden for an automobile accident plaintiff seeking to recover several thousand dollars for an accident, especially when an accident caused by an AV is due to flaws in the car's software rather than its physical components.

AV manufacturers, of course, will not be liable for any and all damage done by or to an AV, but only when it is established that the AV was at fault. Though the operator of the AV may no longer be part of the question, methods of determining fault by the likes of police officers and insurance company representatives will go largely unchanged. If an AV rear-ends another car at a stop sign, the AV is going to be at fault, just as a human would be if that human rear-ended another car with her car.

Additionally, determination of fault will be established more easily due to the development of new technology that can monitor AVs. Absolute liability will expedite and simplify the litigation process, decreasing costs and increasing efficiency. In addition, the uniform AV code should provide that any aftermarket modifications to an AV would create a rebuttable presumption against liability attaching to the automaker. This would protect AV manufacturers from being liable for accidents arising from consumer interference with the technology.

D. NHTSA-REQUIRED MONITORING DEVICE

With uniform state regulations imputing absolute liability on manufacturers of AVs at fault for accidents, the last step of the plan falls to the responsibility of the federal government. Several state governments already require AVs to have monitoring devices that will be used to store data surrounding accidents involving AVs. California law requires that all AVs have a:

> . . . mechanism . . . to capture and store the autonomous technology sensor data for at least 30 seconds before a collision occurs between the autonomous vehicle and another vehicle, object, or natural person while the vehicle is operating in autonomous mode. The autonomous technology sensor data shall be captured and stored in a read-only format by the mechanism so that the data is retained until extracted from the mechanism by an external device capable of downloading and storing the data. The data shall be preserved for three years after the date of the collision.[103]

This required sensor will be integral in determining fault for accidents and isolating the cause of the AV's mistake, when applicable.

The NHTSA should adopt language similar to this California law in requiring all new AVs to be built with monitoring devices. The monitoring device would not only capture sensor data, but would also record inputs by the operator in order to help determine whether or not the operator of the vehicle, rather than the AV, was actually at fault. Furthermore, the NHTSA should require that all AVs disable all operator input when operating in autonomous mode. Autonomous mode could be turned off with the press of a button, but by disabling operator input while in autonomous mode, the monitor data will guarantee that the operator played no part in the AV's autonomous mode mistakes, and thus absolute liability can be imputed upon the manufacturer without question. The monitoring device would allow accident inspectors to know that the car was in fully

103. CAL. VEH. CODE § 38750(c)(1)(G) (West 2015).

autonomous mode and not receiving operator input.

E. INSURANCE IMPLICATIONS

Once automakers are absolutely liable for the accidents caused by their AVs, the burden of paying for insurance coverage will largely shift from the consumer to the manufacturer. AV manufacturers will likely opt to purchase coverage in bulk for all of their AVs on the road. While consumers will not need to pay for coverage for their vehicles for driving in autonomous mode, they will probably still want to take out relatively small policies for comprehensive and uninsured motorist coverage. A consumer policy may also cover the unlikely scenario where an AV causes an accident but is not covered by the manufacturer because the manufacturer recently went out of business. Of course, if a manufacturer of AVs does go out of business, owners of that company's AVs will at some point be required to purchase collision coverage. Consumers will always be required to take out coverage for collisions stemming from conventional operation of their vehicles, which may give further impetus to the idea of removing human-operated controls altogether. Even if steering wheels remain in AVs, an autonomous mode that completely disables human control could end the requirement of consumer collision coverage.

IV. CONCLUSION

Regulation of AVs is extremely complicated because AVs are turning the century-old automobile industry on its head. We can no longer rely on the law of the past and must advance at the pace of technology. A coordinated effort between an independent editorial board charged with the responsibility of promulgating a uniform AV code (that imputes absolute liability on AV manufacturers when AVs cause accidents), the states adopting that code, and the NHTSA requiring monitoring devices and a fully-autonomous mode that disables human input will allow the AV industry to takeoff. Once everybody is playing by the same set of rules, AV manufacturers will be able to focus on their products rather than the law, and the general public will know what to expect from those products. AVs have the potential to completely change our society and our way of life, but the technology is approaching faster than our laws are evolving. In order for society to reap the full benefits of AVs as soon as possible, the laws regulating AVs need to be in the right place, which will take tremendous effort and cooperation by lawmakers and manufacturers alike. While in the near future we will rely on AVs to drive themselves, unfortunately, we cannot rely on AVs to regulate themselves today.