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LET'S GET THIS SHOW ON THE ROAD: DRIVERLESS CARS HAVE ARRIVED AND IT'S TIME TO ADVANCE THE REGULATORY FRAMEWORK

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Whether ordinary Americans realize it or not, the driverless revolution has arrived. They probably do not, unless they are in Chandler, Arizona, where a completely driverless Chrysler minivan can pick them up and taxi them around for their errands;[1] or in Las Vegas, Nevada, where electric buses, with no driver seats, can shuttle them from casinos to their hotels;[2] or in San Francisco, California, where driverless sedans scoot down the strip with steering wheels turning completely on their own.[3] Elon Musk, owner of the electric car company Tesla, projects that new driverless vehicles, rather than traditional, human-controlled ones, will rule the roads within a decade.[4] Swedish automaker Volvo

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1 *See* Ryan Randazzo, *Waymo Expanding Chandler Operations Ahead of Launch of Arizona Public Ride Service*, AZCENTRAL (Aug. 21, 2018), https://www.azcentral.com/story/money/business/tech/2018/08/21/waymo-expands-arizona-footprint-chandler-before-ride-service-start/1046805002/.

2 *See* Matt Weinberger, *I Tried the First Self-Driving Mass Transit in the United States — and Now I'm Excited for the Future of Travel*, BUS. INSIDER (Jan. 14, 2018), https://www.businessinsider.com/las-vegas-downtown-self-driving-shuttle-review-2018-1#it-connects-the-hoppin-container-park-plaza-3.

3 Adam Brinklow, *Watch a Self-Driving Car Self-Drive Itself Through the Mission*, CURBED (Feb. 8, 2017), https://sf.curbed.com/2017/2/8/14554464/gm-cruise-self-driving-car-video-mission.

4 Cadie Thompson, *Elon Musk Has a Stunning Prediction for What Cars Will Be Like 10 Years from Now*, BUS. INSIDER (Feb. 13, 2017), https://www.businessinsider.com/elon-

plans to offer a fully automated car by 2021, in which its "drivers" will be able to "eat, sleep, work, watch a movie, [or] relax" while it shuttles them down the highway.[5] Not to be outdone, American vehicle industry leader Ford expects to roll out a highly automated fleet of commercial vehicles by 2021.[6]

Driverless technology stands to drastically increase safety and save hundreds of thousands of lives.[7] It will result in a multitude of economic benefits for American individuals and companies.[8] It will create a better quality of life for those who are used to being behind the wheel, and it will give the elderly and disabled the opportunity to become independently mobile.[9] In order to reap the benefits of this groundbreaking technology for consumers and manufacturers, American lawmakers must enact a regulatory framework that will usher the technology onto American roads in a smooth and safe manner.[10] Although much of the legwork of instituting legislation has been accomplished,[11] lawmakers' attempts to finalize this feat have proven easier said than done.

There is *some* good news. Both the House of Representatives ("the House") and the Senate have taken steps toward enacting comprehensive legislation that, if passed, would expedite the widespread introduction of this miraculous technology.[12] What is the bad news? Despite bipartisan support, each bill has

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musk-predicts-most-cars-will-be-driverless-in-10-years-2017-2.

5 Tom Huddleston Jr., *Move over Tesla, This Self-Driving Car Will Let You Sleep or Watch a Movie During Your Highway Commute*, CNBC (June 26, 2018), https://www.cnbc.com/2018/06/26/volvo-self-driving-car-sleep-watch-movie-on-commute-by-2021.html ("Self-driving cars may have once sounded like a futurists' pipe dream, but a growing number of automakers and tech giants have helped make widespread autonomous driving seem inevitable within the next few years.").

6 Thompson, *supra* note 4.

7 *See generally* Melissa Bauman, *Why Waiting for Perfect Autonomous Vehicles May Cost Lives*, RAND CORP. (Nov. 7, 2017), https://www.rand.org/blog/articles/2017/11/why-waiting-for-perfect-autonomous-vehicles-may-cost-lives.html.

8 Michelle L. D. Hanlon, *Self-Driving Cars: Autonomous Technology That Needs a Designated Duty Passenger*, 22 BARRY L. REV. 1, 6, 25 (2016) (predicting an expected annual savings of $1.3 trillion for the U.S. economy).

9 David F. Klein, *New Roads: Impacts of Autonomous Vehicles on Law and Insurance,* WESTLAW J. INS. COVERAGE, July 2018, at 1, 1 (explaining driverless cars will offer opportunities to alleviate rush hours, reduce fuel consumption and improve independent mobility for the elderly and disabled); Alissa Walker, *Are Self-Driving Cars Safe for Our Cities?*, CURBED (Mar. 8, 2019), https://www.curbed.com/2016/9/21/12991696/driverless-cars-safety-pros-cons (outlining Google's promotion of driverless technology as transformative for the blind and elderly).

10 *See* Laura Fraade-Blanar & Nidhi Kalra, *Autonomous Vehicles and Federal Safety Standards: An Exemption to the Rule?*, RAND CORP., 1, 10 (2017), https://www.rand.org/content/dam/rand/pubs/perspectives/PE200/PE258/RAND_PE258.pdf.

11 SELF DRIVE Act, H.R. 3388, 115th Cong. (2017); AV START Act, S. 1885, 115th Cong. (2017).

12 H.R. 3388 (as passed by House, Sept. 6, 2017); S. 1885.

stalled, as the House and Senate have failed to reach a compromise on the differences between their respective versions.[13] Furthermore, the Senate, prioritizing other legislation, lacks any sense of urgency to find common ground.[14] This delay could create a domino effect of issues for America. At the forefront, it could lead to the states passing "a patchwork of incompatible laws" that prevent implementing a "consistent national framework."[15] This delay and inconsistency only stunts the growth of the technology, as automakers explain that "regulatory certainty and consistency" is required prior to committing to the technology.[16] From an economic perspective, this delay means America may lose out to Europe and Asia in becoming the lead developer of driverless technology,[17] and it may forfeit the financial windfall that will accompany this achievement.[18] From a humanitarian perspective, the delay means lives that could have been saved will instead be lost.[19] These losses are just the tip of the iceberg, since countless other benefits are expected to flow from this technology.[20]

While passage of a federal framework would certainly create a smoother process for the implementation of driverless technology, there will inevitably be certain "roadblocks" between the current state of affairs and a harmonious, driverless world. For instance, with driver responsibility drastically altered, there is plenty of debate around who will be at fault when accidents *do* occur.[21] To that end, the insurance landscape may also be drastically altered, leading to a decline in revenue.[22] Questions also arise with respect to the environmental

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13 Eric Kulisch, *Hopes Fade for Senate Action on Self-Driving Bill*, AUTOMOTIVE NEWS (July 8, 2018), http://www.autonews.com/article/20180708/OEM11/180709784/autonomous-vehicle-legislation-hopes-dim-senate.

14 *Id*.

15 Damien A. Riehl, *Car Minus Driver: Autonomous Vehicles Driving Regulation, Liability, and Policy: Part I*, 73 BENCH & B. MINN. 18, 23 (2016).

16 Kulisch, *supra* note 13.

17 *House Passes Bipartisan Legislation Paving the Way for Self-Driving Cars on America's Roads*, ENERGY & COM. REPUBLICANS (Sept. 6, 2017), https://republicans-energycommerce.house.gov/news/house-passes-bipartisan-legislation-paving-way-self-driving-cars-americas-roads/; *see also* Kulisch, *supra* note 13 (quoting Ohio Republican Congressman Bob Latta stating, "We want to make sure that the technology that is out there is U.S. technology and we're developing it here.").

18 *See* Hanlon, *supra* note 8, at 25.

19 Bauman, *supra* note 7.

20 *See* Tracy Hresko Pearl, *Fast & Furious: The Misregulation of Driverless Cars*, 73 N.Y.U. ANN. SURV. AM. L. 19, 35-41 (2017).

21 *See, e.g.*, Jeremy Levy, *No Need to Reinvent the Wheel: Why Existing Liability Law Does Not Need to Be Preemptively Altered to Cope with the Debut of the Driverless Car*, 9 J. BUS. ENTREPRENEURSHIP & L. 355, 365, 380-83 (2016); *see also* David King, *Putting the Reins on Autonomous Vehicle Liability: Why Horse Accidents Are the Best Common Law Analogy*, 19 N.C. J. L. & TECH. 127, 133-34 (2017); Bridget Hagan, *The Future Is Now: Driverless Cars and the Insurance Landscape*, FINTECH L. REP., May-June 2016, at 1, 2-3.

22 Michelle Sellwood, *The Road to Autonomy*, 54 SAN DIEGO L. REV. 829, 864-65

impacts caused by a world where car travel is so easy and convenient.[23] In addition, there is some uncertainty as to how existing data privacy law will handle a driverless revolution.[24]

Though there are drawbacks to the implementation of driverless technology, which is to be expected when introducing such a revolutionary technology, the seemingly limitless rewards far outweigh the few downsides. Furthermore, while there are hurdles that must be cleared in order to enjoy the full advantages of the technology, these hurdles are slight, and commonsense solutions often exist to remedy them. The first and most important step toward overcoming these difficulties is passing federal legislation to pave the way for states, automakers, and consumers. Thus, Congress, which has come so close to enacting a regulatory framework, needs to act soon before America's companies and citizens begin to miss out on this revolutionary and life-saving technology.

Part I of this Comment will explain how automated vehicles operate and outline the current technological state. Part II will explain the potential advantages of driverless technology as well as analyze the possible drawbacks and hurdles related to its implementation. Part III will outline the current regulatory landscape, compare the House and Senate proposals for driverless regulation, explain why their differences are minimal, and argue that either proposal, or any combination of the two, would be sufficient, provided that it is passed in a timely manner. It will take the stance that the benefits of a driverless America, the inception of which relies upon initial federal regulation, far outweigh its drawbacks. Part IV will explain why the hurdles that must be cleared in order to implement the technology are easily or practically solved.

I. DRIVERLESS TECHNOLOGY

A. The Five Levels of Automation

Today, the differences between traditional, manned vehicles and driverless cars are not black and white. Great progress has been made in the development of driverless technology.[25] Nevertheless, more improvements will need to be

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(2017).

[23] Justin Worland, *Self-Driving Cars Could Help Save the Environment—Or Ruin It. It Depends on Us*, TIME (Sept. 8, 2016), http://time.com/4476614/self-driving-cars-environment/ ("Self-driving cars will also have a profound effect on the environment—but whether it's for better or for worse will depend on technological and policy choices that have yet to be made.").

[24] Damien A. Riehl, *Car Minus Driver, Part II*, 73 J. MO. B. 264, 290 (2017).

[25] Steve Viscelli, *Driverless? Autonomous Trucks and the Future of the American Trucker*, U.C. BERKELEY CTR. FOR LAB. RES. AND EDU. AND WORKING PARTNERSHIPS USA,

made before driverless vehicles become the norm in America.[26] The transition is expected to be gradual, with heightened reliance on assistive technologies, such as crash avoidance and cruise control, and with cars eventually becoming fully autonomous.[27] However, some have taken a more aggressive route; despite the risks of an unsettled regulatory atmosphere, Tesla has expressed hopes to commercially produce a driverless car in 2019,[28] while Google[29] and Ford[30] each expect to have a driverless "fleet" by 2021.

Regardless of when and how the cars arrive, there is expected to be a wide range of variance within the autonomous field in the near term.[31] In response to this variance, the Society of Automotive Engineers was developed, and the National Highway Traffic Safety Administration ("NHTSA") adopted six classification levels for autonomous vehicles.[32] Level 0 (No Automation), has "zero autonomy," and "the driver performs all driving tasks."[33] At Level 1 (Driver Assistance), the "vehicle is controlled by the driver, but some driving assist features may be included in the vehicle design."[34] At Level 2 (Partial Automation), the "vehicle has combined automated functions, like acceleration and steering, but the driver must remain engaged with the driving task and monitor the environment at all times."[35] At Level 3 (Conditional Automation), a driver must be present "but is not required to monitor the environment," though he or she "must be ready to take control of the vehicle at all times with notice."[36] At Level 4 (High Automation), "the vehicle is capable of performing all driving functions under certain conditions" and "the driver may have the option to control the vehicle."[37] At Level 5 (Full Automation), "the vehicle is capable of

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2 (2018), http://driverlessreport.org/files/driverless.pdf.

26 *See id.* ("[A] number of significant hurdles need to be overcome before autonomous trucks become commonplace on our highways.").

27 Damien A. Riehl, *Car Minus Driver, Part I: Autonomous Vehicles Driving Regulation, Liability and Policy*, 73 J. MO. B. 208, 209 (2017).

28 Melissa Griffin, *Steering (or Not) Through the Social and Legal Implications of Autonomous Vehicles*, 11 J. BUS. ENTREPRENEURSHIP & L. 81, 85 (2018).

29 *Id.*

30 Thompson, *supra* note 4.

31 Riehl, *supra* note 27, at 209.

32 *Automated Vehicles for Safety*, NAT. HIGHWAY TRAFFIC SAFETY ADMIN., https://www.nhtsa.gov/technology-innovation/automated-vehicles-safety (last visited Aug. 31, 2019).

33 *Id.*

34 *Id.*

35 *Id.*; *see also* Riehl, *supra* note 27, at 209; Konrad Budek, *Driverless Car or Autonomous Driving? Tackling the Challenges of Autonomous Vehicles*, DEEPSENSE.AI (Nov. 26, 2018), https://deepsense.ai/driverless-car-or-autonomous-driving-tackling-the-challenges-of-autonomous-vehicles/.

36 *Automated Vehicles for Safety*, *supra* note 32.

37 *Id.*; *see also* Riehl, *supra* note 27, at 209; Budek, *supra* note 35.

performing all driving functions under all conditions."[38]

Currently, Level 2 is the "sweet spot" for manufacturers, as most automobiles developed in 2017 meet its classifications.[39] Most automakers plan to skip Level 3 altogether and to set their sights on graduating directly to Level 4 automation; this is a result of risks presented by potential delays in situations where a human driver would need to take over for the computer. At this point, the driverless revolution will have arrived.[40]

B. How the Technology Works

High-level automation technology is driven largely by "lidar sensors," or "light detection and ranging" devices.[41] Lidar uses pulses of light to measure distances to build maps for driverless vehicles.[42] Once the maps are built, the cars can take the road, using lidar to track their surroundings and comparing what they "see" with their maps.[43] Engineers program the cars with "rules" for how they should respond to certain stimuli.[44] In addition, the cars may also have systems that learn behaviors by introducing the vehicles to huge amounts of data on the country's roadways and using pictures to identify pedestrian behaviors.[45] The cars then use a combination of lidar, cameras, radar, and the Global Positioning System ("GPS") to determine their respective locations and alert themselves to other cars, stoplights, pedestrians, and their surroundings in general.[46]

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38 *Automated Vehicles for Safety*, *supra* note 32.

39 Stan Horaczek, *Here's Where Your New Car Lands on the Self-Driving Scale*, POPULAR SCI. (Jan. 17, 2018), https://www.popsci.com/self-driving-car-scale#page-5.

40 Jeff Davis, *Dreaming of Driverless: What's the Difference Between Level 2 and Level 5 Autonomy?*, NVIDIA (Jan. 25, 2018), https://blogs.nvidia.com/blog/2018/01/25/whats-difference-level-2-level-5-autonomy/ (quoting Volvo CEO Hakan Samuelsson on bypassing level three: "If you are doing something else, research shows that it could take two minutes or more before you can come back and take over. And that's absolutely impossible.").

41 Cade Metz, *How Driverless Cars See the World Around Them*, N.Y. TIMES (Mar. 19, 2018), https://www.nytimes.com/2018/03/19/technology/how-driverless-cars-work.html.

42 *Id*.; *see generally* Leah A. Wasser, *The Basics of LiDAR – Light Detection and Ranging – Remote Sensing*, NEON SCI., https://www.neonscience.org/lidar-basics (last visited Sept. 11, 2019) ("LiDAR or Light Detection and Ranging is an active remote sensing system.").

43 Metz, *supra* note 41.

44 *Id*.

45 *Id*.

46 *Id*.

II. THE ADVANTAGES

A. Safety

Perhaps the most compelling reason to fast-track the introduction of driverless cars is the fact that currently, American roads are inherently unsafe. Automobile accidents cause about thirty-two thousand fatalities and over two million injuries annually in the United States.[47] They are "one of the leading causes of death in the United States and are the leading cause of death for teenagers in the United States."[48] Originally, state and local governments were the predominant regulators of the automobile industry.[49] However noble their efforts, their measures failed to adequately safeguard America's drivers, as annual, traffic-related fatalities totaled over fifty thousand by 1965.[50]

The few federal efforts that were initially made likely hindered, rather than advanced automobile safety. During congressional hearings in 1965, it was "revealed that the results of federally funded research into automobile safety were sometimes suppressed to avoid embarrassing automobile manufacturers" and "the President's Traffic Safety Commission was actually staffed by the employees of automakers, not the federal government."[51] With these revelations, pressure from consumer activist groups mounted.[52] This pressure perhaps culminated with the release of then-young lawyer Ralph Nader's book, *Unsafe at Any Speed: The Designed-In Dangers of the American Automobile*.[53] The book outlined "the gap between existing design and attainable safety," while accusing the automobile industry of failing to take further measures in assuring vehicle safety, and thus neglecting its moral responsibility.[54] Shortly thereafter, President Lyndon B. Johnson signed the National Traffic and Motor Vehicle Safety Act, which called for new or more stringent safety standards while creating an agency to enforce them and supervise the issuance of automotive safety recalls.[55] Following multiple legislative measures in the late 1960s, the

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47 Samuel D. Adkisson, *System-Level Standards: Driverless Cars and the Future of Regulatory Design*, 40 U. HAW. L. REV. 1, 3 (2018).

48 Carrie Schroll, *Splitting the Bill: Creating a National Car Insurance Fund to Pay for Accidents in Autonomous Vehicles*, 109 NW. U. L. REV. 803, 807 (2015).

49 Adkisson, *supra* note 47, at 7.

50 *Id.*

51 *Id.*

52 Kevin M. McDonald, *Judicial Review of NHTSA-Ordered Recalls*, 47 WAYNE L. REV. 1301, 1303 (2001).

53 Christopher Jenson, *50 Years Ago, 'Unsafe at Any Speed' Shook the Auto World*, N.Y. TIMES (Nov. 26, 2015), https://www.nytimes.com/2015/11/27/automobiles/50-years-ago-unsafe-at-any-speed-shook-the-auto-world.html.

54 *Id.*

55 *Id.*

NHTSA was born.[56] While the efforts of the agency have been spotty,[57] there is no doubt it has succeeded in saving lives, as death rates have dropped five fold.[58]

Clearly, the automotive industry has come a long way since the turmoil of the 1960s. While vehicle safety has improved, thanks in large part to the efforts of the NHTSA, automobiles are still a leading cause of death.[59] However, the issue is no longer primarily due to car manufacturers failing to build safe cars or a lack of strong federal regulation.[60] Rather, it is seemingly unavoidable human error that accounts for the vast majority of traffic accidents today.[61] Out of a sample of 5,471 automobile accidents examined by the NHTSA between 2005 and 2007, an overwhelming 93 percent were caused by human error, while only 2 percent were caused by vehicle defect.[62] In addition, this alarming statistic could further increase with the rise of the smartphone and other technological distractions; in fact, automobile accident deaths in the United States increased by 14 percent between 2014 and 2016.[63] Even if the NHTSA could be doing more, as many field experts argue,[64] there is no doubt the agency has drastically minimized the number of deaths caused by manufacturer defect.[65] However, since over 90 percent of current car accidents are still caused by human error, regulation should be geared toward addressing this issue.[66] While efforts to minimize product defects are noble, the real issue lies not with the cars

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56 *See* McDonald, *supra* note 52, at 1303-06.

57 *See* Adkisson, *supra* note 47, at 9 ("Of the fifty 'general safety regulations' issued under the MVSA from 1966 to the mid-1980s, forty-five were issued prior to 1974, and zero were issued after 1976."); *see also* Hilary Stout et al., *Regulator Slow to Respond to Deadly Vehicle Defects*, N.Y. TIMES (Sept. 14, 2014), https://www.nytimes.com/2014/09/15/business/regulator-slow-to-respond-to-deadly-vehicle-defects.html ("The agency's handling of major safety defects … found that it frequently has been slow to identify problems, tentative to act and reluctant to employ its full legal powers against companies.").

58 *See* Jenson, *supra* note 53 ("In 1965, there were about five deaths for every 100 million miles traveled, according to the traffic safety agency. In 2014 … there was one death for every 100 million miles.").

59 Riehl, *supra* note 27, at 210 (explaining that today, vehicle accidents account for "nearly three times the number who die in firearm homicides"); *see also Driverless Cars and the Imperative of Safety*, FIN. TIMES (Mar. 20, 2018), https://www.ft.com/content/df4b266e-2c2f-11e8-9b4b-bc4b9f08f381 ("Last year about 1.3m people died in road accidents across the world.").

60 Riehl, *supra* note 27, at 210.

61 Schroll, *supra* note 48, at 804-05, 807.

62 *Id.* at 807.

63 Keith Naughton, *Just How Safe Is Driverless Car Technology, Really?*, BLOOMBERG (Mar. 27, 2018), https://www.bloomberg.com/news/articles/2018-03-27/just-how-safe-is-driverless-car-technology-really-quicktake.

64 Jenson, *supra* note 53.

65 *Id.*

66 Todd Litman, *Autonomous Vehicle Implementation Predictions*, VICTORIA TRANSP. POL'Y INST., 10 (Mar. 18, 2019), https://www.vtpi.org/avip.pdf.

themselves, but with the fact that humans operate them.[67]

There is debate as to whether a driverless revolution would result in safer roads. For instance, Keith Naughton of the Victoria Transit Policy Institute, an independent Canadian think tank, explains that just because 90 percent of accidents are a result of human error, a driverless world will not necessarily mean a 90 percent decrease in automobile accidents.[68] For example, hardware and software failures will be inevitable, leading to potentially "catastrophic results."[69] Drivers cloaked with a feeling of safety or invincibility may be prone to taking more risks like not wearing their seatbelts.[70] Platooning, the process of multiple driverless cars' computers interacting with one another to form a line of vehicles following one another at very close distances,[71] could create risks for human-controlled vehicles travelling nearby or other autonomous cars attempting to join the platoon.[72] In addition, the amount of vehicle travel may increase, naturally creating more exposure to car accidents.[73] At the same time, early driverless vehicles may have issues detecting pedestrians, bicyclists, and motorcyclists, causing additional risks for those using alternative means of transportation.[74]

Furthermore, there have already been accidents involving autonomous vehicles, which defeats any argument that driverless technology is foolproof.[75] Tesla vehicles operating in "autopilot mode," (which is not high-level autonomy) have been involved in a few fatal accidents.[76] Most notably, in March 2018, a totally driverless car operated by Uber struck and killed a woman walking her bike across the street in Tempe, Arizona.[77]

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67 Kristin Houser, *Many Self-Driving Car Accidents Have Been Caused by Humans*, BUS. INSIDER (Sept. 5, 2018), https://www.businessinsider.com/self-driving-car-accidents-caused-by-humans-2018-9.

68 Litman, *supra* note 66, at 10.

69 *Id.*

70 *Id.*

71 *How an Automated Car Platoon Works*, U.S. DEP'T. OF TRANSP. VOLPE CTR. (July 31, 2017), https://www.volpe.dot.gov/news/how-automated-car-platoon-works.

72 Litman, *supra* note 66, at 10.

73 *Id.*

74 *Id.*

75 Carolyn Said, *In Waymo Self-Driving Car Crash, Human Driver Was at Fault*, GOV'T TECH. (Sept. 1, 2019), https://www.govtech.com/fs/In-Waymo-Self-Driving-Car-Crash-Human-Driver-Was-at-Fault.html; Lulu Chang & Luke Dormehl, *Six Self-Driving Car Crashes Tapped the Brakes on the Autonomous Revolution*, DIGITAL TRENDS (June 22, 2018), https://www.digitaltrends.com/cool-tech/most-significant-self-driving-car-crashes/; Jason Silverstein, *Driver Says Tesla Car Gets "Confused" and Crashes on Highway*, CBS NEWS (Feb. 13, 2019), https://www.cbsnews.com/news/tesla-autopilot-car-gets-confused-and-crashes-on-highway/.

76 Jack Stewart, *Tesla's Autopilot Was Involved in Another Deadly Car Crash*, WIRED (Mar. 30, 2018), https://www.wired.com/story/tesla-autopilot-self-driving-crash-california/.

77 Daisuke Wakabayashi, *Self-Driving Uber Car Kills Pedestrian in Arizona, Where*

So, while a full 90 percent reduction in accidents may not be the cakewalk that driverless proponents hope for (at least at first), driverless technology will nevertheless make American roadways safer.[78] Between now and 2025, the limited amount of driverless technology that makes it on the roads is expected to prevent twenty-eight thousand crashes and twelve thousand injuries.[79] Even if driverless technology is released onto the roads en masse and prior to the absolute perfection of the technology, thousands of lives still stand to be saved.[80] In a study by RAND Corporation, three scenarios concerning the timing of the widespread release of autonomous vehicles were examined.[81] The study made projections based on the introduction of autonomous vehicles to the roads when they would be 10 percent, 75 percent, and 90 percent safer than traditional automobiles, adjusted for the expected time it would take for the technology to reach its designated percentage point.[82] RAND Corporation projected that if driverless vehicles were released onto the roads in 2020, when the cars are expected to be just 10 percent safer than regular automobiles (as opposed to being withheld from the roads until the technology can offer a larger improvement), as many as three thousand lives per year would be saved over the other models.[83] Under this model, by 2070, driverless technology would save 1.1 million lives.[84] Thus, it is imperative from a safety perspective that this technology be released onto the roads as soon as possible so its life saving capabilities can be fully enjoyed.[85]

Statistics and projections aside, a driverless world has obvious practical safety benefits. For instance, the high-risk behaviors and lapses in judgment drivers are currently prone to will be eliminated.[86] As one expert explains, "Self-driving

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Robots Roam, N.Y. TIMES (Mar. 19, 2018), https://www.nytimes.com/2018/03/19/technology/uber-driverless-fatality.html.

78 Sarah J. Fox, *Planning for Density in a Driverless World*, 9 NE. U. L. REV. 151, 163 (2017).

79 Max Chafkin, *The Autonomous-Car Company That's Selling Safety First*, BLOOMBERG BUSINESSWEEK (May 16, 2018), https://www.bloomberg.com/news/features/2018-05-16/intel-s-autonomous-car-company-is-selling-safety-first.

80 Aarian Marshall, *To Save the Most Lives, Deploy (Imperfect) Driverless Cars ASAP*, WIRED (Nov. 7, 2017), https://www.wired.com/story/self-driving-cars-rand-report/.

81 Bauman, *supra* note 7.

82 *Id.*

83 Marshall, *supra* note 80.

84 *Id.*

85 Emily Stewart, *Self-Driving Cars Have to Be Safer than Regular Cars. The Question Is How Much*, VOX (May 17, 2019), https://www.vox.com/recode/2019/5/17/18564501/self-driving-car-morals-safety-tesla-waymo (referring to the study from the RAND Corporation in 2017 as well as arguing that the sooner this technology is released, the more lives can be saved).

86 *See* Mark Golden, *Are Driverless Cars Bad for the Environment?*, STAN. EARTH (June 27, 2018), https://earth.stanford.edu/news/are-driverless-cars-bad-environment#gs.6vqjeb.

cars won't drink, won't text while driving. They won't get tired, won't get distracted. . . . Self-driving cars will eliminate all of those deaths and injuries."[87] Also, the risks that young and inexperienced drivers present to themselves and to other motorists will largely become obsolete as "fleets of self-driving cars gain driving wisdom in unison, and therefore break humanity's continuous cycle of reintroducing dangerous novice drivers to the traffic mix."[88] Autonomous vehicles can be equipped with crash data recorders, making it easier for automakers and computers to learn from accidents and adjust accordingly.[89] In addition, considering 29 percent of car accidents go unreported,[90] driverless technology will give manufacturers and authorities an opportunity to learn from all accidents, rather than just those that are reported.[91]

Ultimately, accidents will likely become a rare occurrence, rather than a common hazard of the road. As one author explains, "In all likelihood, it will be the weird, one-in-a-million corner cases that cause accidents in a world with lots of autonomous cars. A driver on LSD, for example, or a kangaroo on the road, or a woman walking a bike where a computer doesn't expect her."[92]

The accidents that have occurred have been few and far between, and their possible explanations negate a conclusion that driverless technology is inherently unsafe.[93] For instance, in the Arizona accident, the vehicle's emergency braking system had been disabled by Uber employees; the vehicle had actually detected the victim a full six seconds prior to the accident.[94] The two Tesla accidents involved lower-level automation where drivers are still expected to be fully alert with their hands on the wheel, rather than the higher-level automation that will ultimately make American roads safer.[95] Nevertheless, it took Tesla's autopilot technology over 130 million miles of travel before being involved in a fatal accident; in comparison, vehicles in the United States are

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87 *Id.*

88 Mitch Turck, *How Much Safer Should Self-Driving Cars Be? Try 0%*, FORBES (July 9, 2018), https://www.forbes.com/sites/mitchturck/2018/07/09/how-much-safer-should-self-driving-cars-be-try-0.

89 Hanlon, *supra* note 8, at 24.

90 Turck, *supra* note 88.

91 Andrea Martinesco et al., *A Note on Accidents Involving Autonomous Vehicles: Interdependence of Event Data Recorder, Human-Vehicle Cooperation and Legal Aspects*, 54 IFAC-PAPERSONLINE 407, 407-08 (2019) (explaining that the mandatory Event Data Recorder (EDR) would be able to categorize and discriminate the reasons of accidents and serve authorities where an accident happens).

92 Chafkin, *supra* note 79.

93 *Id.*; Nathan Bomey, *Uber Self-Driving Car Crash: Vehicle Detected Arizona Pedestrian 6 Seconds Before Accident*, USA TODAY (May 24, 2018), https://www.usatoday.com/story/money/cars/2018/05/24/uber-self-driving-car-crash-ntsb-investigation/640123002/.

94 Bomey, *supra* note 93.

95 Stewart, *supra* note 76.

generally involved in a fatal accident every 94 million miles.[96] Worldwide, the number drops to an alarming 60 million miles.[97]

In the end, the safety benefits of driverless technology may only go as far as the regulatory scheme allows.[98] Furthermore, in the interim period prior to an entirely or mostly driverless society, the interplay between driverless and traditional vehicles may create enough dangerous situations to stunt the full realization of driverless safety benefits.[99] However, this is a necessary cost to pay for a much safer future where losing "hundreds of thousands of lives" to car accidents each year will no longer be the norm.[100]

B. Quality of Life

Beyond saving lives, there are plenty of ways in which driverless technology will also improve the lives of Americans. Those who normally spend their time behind the wheel paying attention to the road will be able to sleep, work, watch television, or partake in other leisure activities.[101] This flexibility will make for a better quality of life for society in general.[102] Commuters will have more wholesome and productive lives due to the minimization of time spent on the road; indeed, those who spend a great deal of time in the car generally "get 30 minutes less sleep, watch TV a half-hour less and do 30 minutes less work than their counterparts who drive less."[103] Individuals previously prevented from driving altogether due to disability will be able to get from point A to point B like everyone else, which is a spectacular development considering how this subpopulation currently relies on others to undertake seemingly basic tasks.[104]

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96 Riehl, *supra* note 27, at 209.

97 *Id.*

98 *Id.* at 210–11.

99 Fox, *supra* note 78, at 163.

100 Bauman, *supra* note 7.

101 Eric Williams, *Autonomous Vehicles Could Help Millions of People Catch up on Sleep, TV and Work*, THE CONVERSATION (Jan. 11, 2018), http://theconversation.com/autonomous-vehicles-could-help-millions-of-people-catch-up-on-sleep-tv-and-work-89603.

102 *See* Golden, *supra* note 86 ("The liberty to work, sleep or play games—however people want to spend their increased free time—will benefit the human environment that was part of the resolution under debate….").

103 Williams, *supra* note 101.

104 Joe Rinzel, *Driverless Cars Can Transform Lives — If We Change the Rules and Let Them***,** USA TODAY (Nov. 21, 2017), https://www.usatoday.com/story/opinion/2017/11/21/driverless-cars-can-transform-lives-if-states-cities-change-rules-let-them-joe-rinzel-column/880541001/; *see also* Golden, *supra* note 86 ("A whole spectrum of people in our society who cannot drive today, like the blind and disabled, will have much improved lives from this revolutionary change.").

C. The Economy

From an economic perspective, the driverless revolution has already created a multitude of highly desirable jobs for American workers.[105] Moreover, projections show that these numbers will continue to increase with time and further implementation of the technology.[106] Admittedly, the driverless revolution's creation of new and desirable job opportunities for the American workforce may lead to a decline in employment in other industries.[107] For instance, the trucking industry is expected to be one of the industries most affected by the advent of driverless technology.[108]

One study projects that, depending on the level of success the technology achieves, as many as 294,000 trucking jobs will be lost over the next twenty-five years.[109] However, the jobs facing elimination are largely undesirable, as illustrated by the trucking industry's high unemployment numbers and domination by an older workforce.[110] Indeed, the study explains that the industry is currently experiencing a "driver shortage," and notes that while there are ten million commercial driver's license holders in the United States, there are only three million trucks on the road that require that license.[111] This, the study explains, is at least in part due to the fact that "several million [commercial driver's license] holders are workers who have had the misfortune to pass through for-hire long-haul trucking's revolving door."[112] Finally, the study predicts that with the expansion of e-commerce and the growing need for drivers who can handle short trips in urban areas, displaced workers should easily find other employment utilizing their respective driving backgrounds.[113] Thanks to the gradual nature of the implementation of driverless technology, the negative impacts may never be fully experienced by a workforce that is largely retired by the time the technology is implemented, while those still employed should have no problem finding alternative work.[114]

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105 Carmen Reinicke, *Autonomous Vehicles Won't Only Kill Jobs. They Will Create Them, Too*, CNBC (Aug. 11, 2018), https://www.cnbc.com/2018/08/10/autonomous-vehicles-are-creating-jobs-heres-where.html.

106 *Id.*

107 David Ryan Polgar, *What's More Important, 4 Million Jobs or a $7 Trillion Economy?*, BIG THINK (Jan. 5, 2018), https://bigthink.com/david-ryan-polgar/driverless-vehicles-may-eliminate-40-million-jobs-but-it-may-also-create-a-7-trillion-passenger-economy.

108 Reinicke, *supra* note 105.

109 Viscelli, *supra* note 25, at 2.

110 Reinicke, *supra* note 105.

111 Viscelli, *supra* note 25, at 40.

112 *Id.*

113 *Id.* at 2.

114 Reinicke, *supra* note 105; *see also* Viscelli, *supra* note 25, at 41 (explaining that the jobs truck drivers ultimately transition into may, in some circumstances, be even less

D. The Environment

While debate has ensued as to how driverless cars will impact the environment,[115] if lawmakers allow the technology to be properly implemented,[116] the impact is expected to be overwhelmingly positive.[117] Critics argue that if driverless technology ultimately meets expectations, people will be incentivized to use cars more than public transportation based on safety and quality of life improvements.[118] Furthermore, with easier transportation, people will also be incentivized to travel by car more often.[119] As energy expert Ognen Stojanovski explains, "Once you make things easier to move around, you get a lot more of it moving than you had before. . . . So, we're going to have a lot more people driven to a lot more places than they previously were."[120] With an increase in quality of life while driving, people will not mind having longer commutes, leading to increased populations in more remote suburbs.[121] The average American's commute to work will simply be a longer distance than before.[122]

With people incentivized to travel more often and over farther distances, the natural concern is that there will be more car travel, which will lead to more pollution.[123] However, this concern can be quelled through the realization of a variety of factors.[124] First, most of the driverless cars being tested today are electric, and this trend is expected to continue.[125] Thus, driverless cars will use

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desirable than those they already occupy). *But see* Polgar, *supra* note 107 (explaining that though traditional driving centered positions like taxi operator may disappear, new jobs such as '"remote vehicle operators' may crop up to offset the job losses").

115 *See* Golden, *supra* note 86 (summarizing a debate between four energy experts as to whether autonomous vehicles will have a positive impact on the natural and human environment).

116 Worland, *supra* note 23.

117 *See generally* Ian Andrew, *The Environmental Benefits of Driverless Cars*, GREENER IDEAL (Aug. 31, 2017), https://greenerideal.com/news/vehicles/driverless-cars-environmental-benefits/; *see also* Golden, *supra* note 86.

118 Golden, *supra* note 86 (quoting energy expert Ognen Stojanovski who argues, "The most efficient, environmentally friendly way to move people is by buses and trains at high utilization…. Instead, with autonomous vehicles we'll no longer want to go on [public transportation]. We'll want to be by ourselves getting work done, sleeping, whatever. We'll want to live farther and farther away from where we work.").

119 *Id.*

120 *Id.*

121 Worland, *supra* note 23.

122 *See id.*

123 *Id.*

124 *See generally* Andrew, *supra* note 117.

125 *Id.*; *see generally* Joe Levy, *Top 5 Market Trends Driverless Cars Will Rev Up in the Future*, WIRED, https://www.wired.com/insights/2013/08/top-5-market-trends-driverless-cars-will-rev-up-in-the-future/ (last visited Nov. 17, 2019).

cleaner forms of energy than gas and have a much smaller impact on the environment.[126] In addition, these cars will be more efficient than their human-operated counterparts.[127] Currently, "most gas is burned when driving at high speeds, braking, and re-accelerating excessively."[128] Driverless cars will be programed to eliminate this style of driving and to move more smoothly through traffic,[129] which will result in less energy being used.[130] In the same vein, because driverless cars will be less prone to accidents, manufacturers will be able to cut some of their bulky safety components from production, leading to lighter, more energy efficient vehicles.[131]

The environment will also benefit as a result of diminished traffic congestion, which "will improve air quality and reduce greenhouse gas emissions."[132] Congestion is expected to decrease as automated vehicles can adjust their routes to avoid traffic jams and bottlenecking far more efficiently than humans.[133] The design of "smart traffic light" systems will allow automated vehicles to navigate more efficiently and steadily through intersections and will also decrease traffic light congestion within cities.[134] Furthermore, it logically follows that with safer automobiles and less accidents, there will be less traffic jams in the first place.[135]

In addition, the number of vehicles travelling with just one passenger is expected to decrease, leading to further decreases in congestion.[136] For instance, while there may be a shift away from large-scale public transportation, some expect an increase in small-scale operations where a handful of people will

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126 *See generally* Andrew, *supra* note 117.

127 *See generally id.*

128 *Id.*

129 Golden, *supra* note 86.

130 *See* Andrew, *supra* note 117.

131 Worland, *supra* note 23 ("Vehicle automation will allow vehicle makers to dump pounds and pounds of safety equipment that contribute to the weight of vehicles as self-driving makes accidents a rarity. Anti-lock brakes, air bags and laminated glass are among the many features that have made driving so much safer in recent decades while also increasing the weight of vehicles."); *see also* Andrew, *supra* note 117 ("It's also expected that, as driverless car technology is advanced, the weight of the cars will drop as a result of lighter batteries, and less need for heavy safety modifications to the engine.").

132 Golden, *supra* note 86.

133 *Id.*; *see* Dalvin Brown**,** *How Self-Driving Car or Adaptive Cruise Control Could Ease Traffic Jams*, USA TODAY (July 3, 2018), https://www.usatoday.com/story/money/2018/07/03/self-driving-reduces-traffic-jams-study-says/741985002/; *see also* Radim Cmar, *How Intelligent Car Navigation Could Improve City Traffic Conditions*, SMART CITIES WORLD (May 13, 2019), https://www.smartcitiesworld.net/opinions/opinions/how-intelligent-car-navigation-will-improve-city-traffic-conditions.

134 *See generally* Golden, *supra* note 86.

135 *See* Jake Thomas, *Will Smarter Cars Really Mean Less Traffic?*, GOV'T TECH. (Dec. 29, 2017), https://www.govtech.com/fs/news/Will-Smarter-Cars-Really-Mean-Less-Traffic.html.

136 *See generally* Golden, *supra* note 86.

commute together in one car or van instead of traveling separately.[137] Moreover, due to an increase in productivity and quality of life during the commute, the number of cars per household should decrease, as "one vehicle can now drop the kids off at school, take both mom and dad to work, and then park itself until it's time to pick them back up."[138]

Although the environment stands to benefit from driverless technology, it will require an adequate government support system for the benefits to be realized. A study by the Department of Energy demonstrates that autonomous vehicles stand to decrease energy consumption by as much as 90 percent.[139] However, without legislation, driverless cars could increase energy consumption by as much as 200 percent under certain circumstances.[140] In order to land on the proper end of this variable spectrum, policymakers must prioritize efficiency.[141] For instance, manufacturers should be incentivized to create cars designed to take the most efficient routes.[142] Similarly, drivers could be incentivized to use ride-sharing programs, and cars that are travelling while unoccupied could be penalized.[143] Regardless, the first step toward realizing the environmental and other benefits of driverless technology is legislation allowing automakers to confidently pursue a driverless society.

III. THE CURRENT LEGISLATIVE STATE

In 2017, Congress took the initial steps toward enacting a driverless technology bill, and a comprehensive scheme seemed to be on the fast track.[144] In September 2017, the House of Representatives unanimously passed the SELF DRIVE Act by voice vote.[145] A month later, the Senate introduced the AV START Act, which unanimously passed through the Senate Commerce Committee, but never made it to a vote.[146] With the attention of both the House and Senate and initial bipartisan support, one would have thought that a bill would have been passed almost two years later. However, legislation has completely stalled, with no meaningful progress to report since the bills were

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137 *Id.*
138 Andrew, *supra* note 117.
139 Worland, *supra* note 23.
140 *Id.*
141 *Id.*
142 *Id.*
143 *Id.*
144 *See* SELF DRIVE Act, H.R. 3388, 115th Cong. § 2 (2017); AV START Act, S. 1885, 115th Cong. § 2 (2017).
145 *House Passes Bipartisan Legislation Paving the Way for Self-Driving Cars on America's Roads*, *supra* note 17.
146 Kulisch, *supra* note 13.

introduced.[147] As of the conclusion of the 115th Congress in December 2018, legislation remained unpassed.[148]

Many factors may underlie this troublesome delay. In early 2018, five Democrats in the Senate sent a letter to the heads of the Senate Committee on Commerce, Science, and Transportation, the committee which advanced the AV START Act.[149] The letter expresses concerns with various aspects of the act, chiefly the manner in which it addresses safety standards, cybersecurity, and state law preemption.[150] In addition, Democrats are making a push for more stringent oversight of consumer protection related to autonomous cars prior to the passing of legislation.[151] A handful of accidents involving driverless cars have not sped up the process either.[152] Concerns arising from these accidents have led to investigations which some lawmakers may want to see develop before committing to a legislative scheme.[153] On the Republican side, the delay may be partially due to lawmakers focusing on other legislation.[154]

Outside of Congress, the bills have come under attack from various organizations. For instance, the American Association for Justice, an organization representing the interests of trial lawyers, has mobilized against multiple versions of the legislation despite claims that it is placing "its members' narrow interests ahead of the lives of American road users."[155] Similarly, stakeholders, such as bicycle and health activists, have called for changes to the AV START Act.[156]

Compounding the frustration of this delay is the fact that the bills, though

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147 *Id.*

148 Chris Teale, *Federal AV Legislation to Go No Further in Congress*, SMART CITIES DIVE (Dec. 21, 2018), https://www.smartcitiesdive.com/news/AV-START-Act-autonomous-vehicle-legislation/544907/.

149 Letter from Dianne Feinstein, Kirsten Gillibrand, Edward J. Markey, Richard Blumenthal & Tom Udall, Senators, U.S. Senate, to John Thune & Gary Peters, Senators, U.S. Senate (Mar. 14, 2018), https://www.feinstein.senate.gov/public/_cache/files/f/1/f168c367-bec0-48cc-9220-6a13cbd9dd27/D00752809320841613B5F03BB8517FC2.03.14.2018-av-start-act-letter.pdf.

150 *Id.* at 2.

151 Naughton, *supra* note 63.

152 *See id.*

153 Pete Bigelow, *Safety Advocates Sound Alarm on Self-Driving-Vehicle Legislation*, CAR & DRIVER (July 24, 2018), https://www.caranddriver.com/news/safety-advocates-sound-alarm-on-self-driving-vehicle-legislation.

154 Kulisch, *supra* note 13.

155 Teale, *supra* note 148.

156 Chris Teale, *Letter Urges More Debate of AV START Act in US Senate*, SMART CITIES DIVE (July 26, 2018), https://www.smartcitiesdive.com/news/av-start-act-us-senate-letter-stakeholders/528697/ (explaining a letter from activists "calls for changes to the legislation, including limiting exemptions from safety standards, providing for data collection and maintaining the rights of states and local governments to regulate autonomous vehicles (AVs) when the federal government does not").

differing on some aspects, are largely similar.[157] Each bill is aimed at preserving the current approach to automobile legislation while making slight adjustments to accommodate driverless technology.[158] Each seeks to promote automated vehicle technology and clear the way for testing and development.[159] Each recognizes "that longer term regulatory changes are needed, and that more information will be needed to adopt appropriate longer-term rules," but they still purport to promote driverless technology in the interim; they do so by allowing the NHTSA to provide manufacturers with an increased number of safety "exemptions" for the testing of new driverless technology.[160] In each bill, trucks are excluded.[161] This is an impactful measure when it comes to expediting the legislative process since driverless trucking technology is expected to face heightened regulatory challenges, which will likely be spearheaded by unions.[162] Neither bill requires driverless technology to have a fallback or a manual override feature.[163] Perhaps most importantly, each bill contains a federal preemption clause preventing states from passing competing legislation.[164] Such a measure is needed to ensure states do not pass inconsistent laws and to prevent confusion for manufacturers.[165] In the same vein, each bill has a clause noting that compliance with federal safety standards does not necessarily preempt common law liability at the state level.[166]

While the two proposals are largely similar, there are a few differences between them that will need to be reconciled in order for comprehensive

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157 Jacob Jensen, *Self-Driving but Not Self-Regulating: The Development of a Legal Framework to Promote the Safety of Autonomous Vehicles*, 57 WASHBURN L.J. 579, 609 (2018).

158 David Coburn et al., *Senate Commerce, Science, and Transportation Committee's AV START Act Advances*, LEXOLOGY (Oct. 11, 2017), https://www.lexology.com/library/detail.aspx?g=2ad11d12-768e-4c41-8a99-27539ddd3949; *see also* King, *supra* note 21, at 130 ("The Act requires that the federal government research, test, and certify the safety of autonomous vehicle products, pre-empting any contrary state law. Meanwhile, it leaves 'registration, licensing, driving education and training, insurance, law enforcement, crash investigations, safety and emissions inspections' within the authority of the states.").

159 Jensen, *supra* note 157, at 597.

160 Coburn et al., *supra* note 158.

161 *See* SELF DRIVE Act, H.R. 3388, 115th Cong. (2017); AV START Act, S. 1885, 115th Cong. (2017).

162 Colin McCormick, *What's in the AV START Act?*, MEDIUM (Oct. 2, 2017), https://medium.com/@cfmccormick/whats-in-the-av-start-act-8f91780e8f8b; *see also* Gina Chon, *Teamsters Union Tries to Slow Self-Driving Truck Push*, N.Y. TIMES (Aug. 11, 2017), https://www.nytimes.com/2017/08/11/business/dealbook/teamsters-union-tries-to-slow-self-driving-truck-push.html.

163 Jensen, *supra* note 157, at 609.

164 *Id.*

165 *See* Kulisch, *supra* note 13.

166 Coburn et al., *supra* note 158.

legislation to be passed,[167] though none of the differences seem insurmountable.[168] First, while both the Senate and House agree that more information is needed in order to enact long term safety legislation, their proposed means to research and investigate the matter differ.[169] The AV START Act instructs the director of the Volpe Center, the Department of Transportation's ("DOT") safety research arm,[170] to review legislation in search of areas where current law may conflict with driverless technology's development and to report back with its findings and suggestions within six months.[171] Under the act, the DOT would have one year to consider the suggestions and edit and implement them as it sees fit; if it were to take no action, the Volpe Center suggestions would become federal regulations.[172] The SELF DRIVE Act proposes that the secretary of the DOT submit a similar report to Congress within one year of the bill's enactment and issue its regulations within eighteen months of enactment, updating its policies every two years for the first five years following enactment.[173] The two proposals also vary on the topic of data privacy.[174] The House bill is very thorough in this regard, requiring manufacturers to develop comprehensive written privacy plans and to make them available to consumers prior to the sale of automated vehicles.[175] In addition, it requires the Federal Trade Commission ("FTC") to conduct studies and police manufacturers with respect to data privacy.[176] The Senate version takes a more laid back and seemingly incomplete approach.[177] It requires the creation of a publicly searchable database by the NHTSA which includes "a description of the information, including personally identifiable information, that will be collected about individuals during the operation of motor vehicles," as well as descriptions of how the information will be used and protected by

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167 Eric Phillips, *The Future of Autonomous Vehicles in American Cities*, 21 N.Y.U. J. LEGIS. & PUB. POL'Y 287, 313-14 (2018).

168 Jensen, *supra* note 157, at 597.

169 Coburn et al., *supra* note 158.

170 *See About Us*, U.S. DEP'T OF TRANSP. VOLPE CTR. (Feb. 22, 2019), https://www.volpe.dot.gov/about-us ("[The Volpe Center] work[s] to anticipate emerging transportation issues and objectively address the nation's most pressing and complex transportation challenges, particularly those that can be solved with an intermodal, systems perspective. [Its] solutions emphasize safety, infrastructure, innovation, and accountability.").

171 McCormick, *supra* note 162.

172 *Id.*

173 SELF DRIVE Act, H.R. 3388, 115th Cong. § 4(a) (2017).

174 *See* H.R. 3388 § 12; AV START Act, S. 1885, 115th Cong. § 20 (2017).

175 H.R. 3388 § 12(a).

176 *Id*. § 12(b)-(c).

177 *See* S. 1885 § 20(a)(1) (referring to a section (c) for contents of database to database while not having a section (c), leaving open the question of whether additional information will need to be required).

manufacturers.[178] Finally, the SELF DRIVE Act seeks to regulate NHTSA's classification Levels 2 through 5, while the AV DRIVE Act only addresses Levels 3 through 5.[179]

As efforts aimed at a federal regulatory solution continue to stall, the fear that a patchwork of state laws will develop slowly inches closer to reality.[180] Most states have introduced legislation concerning automated vehicles, while twenty-nine states and Washington, D.C. have actually passed such legislation or are operating under executive orders.[181] While in many states legislation simply opens the door for research and testing,[182] some legislation is actually beginning to put vehicles on the road.[183] Fourteen states have no legislation or executive order at all;[184] this may be because they are waiting for congressional guidance on the matter before spending time on legislation that will ultimately be preempted by federal law.[185] Most states have been unable to pass legislation expressly permitting driverless technology to hit the road.[186] However, the regulatory environment varies from state to state and is continually changing, and without federal action, the patchwork of state laws will continue to develop along with the feared consequences that accompany it.[187]

The lack of a federal regulatory scheme "lags the [development]" of driverless technology through a myriad of factors.[188] For instance, only 2,500 federal exemptions are available to get driverless vehicles onto the road today,[189] a number that both bills purport to drastically increase, thereby seriously

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178 *See* S. 1885 § 20(a).

179 Jensen, *supra* note 157, at 609.

180 Charity Allen, *State Road Rules: A Troubling Patchwork of Regulations*, AURORA BLOG (Aug. 28, 2019), https://medium.com/aurora-blog/state-road-rules-a-troubling-patchwork-of-regulations-f2b77629d523.

181 *See* Griffin, *supra* note 28, at 109-10 (outlining a year by year uptick in the number of state bills introduced since 2012); *see also Autonomous Vehicles: Self-Driving Vehicle Enacted Legislation*, NAT'L CONF. OF STATE LEG., 1 (Oct. 8, 2018), http://www.ncsl.org/research/transportation/autonomous-vehicles-self-driving-vehicles-enacted-legislation.aspx.

182 *See, e.g.*, Act of June 27, 2017, Ct. Pub. Act No. 17-69; H.R. 4063, 79th Leg., Reg. Sess. (Or. 2018); H.R. 373, 2015 Leg., Gen. Sess. (Utah 2015).

183 *See* Assemb. 511, 80th Leg., Reg. Sess. (Nev. 2011); H.R. 7027, 2016 Leg., Reg. Sess. (Fla. 2016).

184 *See Autonomous Vehicles: Self-Driving Vehicle Enacted Legislation*, *supra* note 181, at 2.

185 *See id.* at 2-3.

186 *See* Riehl, *supra* note 27, at 230.

187 Brad Stone, *Senate Bill Could Clean Up Patchwork Autonomous Vehicle Laws*, BLOOMBERG NEWS (Mar. 26, 2018), https://www.ttnews.com/articles/regulators-are-asleep-wheel-self-driving-cars.

188 *Id.*

189 Horaczek, *supra* note 39.

alleviating manufacturer fears.[190] Also, without federal regulation, automakers may avoid development of driverless technology from a mere practicality standpoint: why try to sell a car that consumers can only buy in a few states?[191] This prediction has already come true in the United States. German automobile manufacturer Audi's 2019 A8 model is equipped with a feature called "Traffic Jam Pilot," a Level 3 automation feature.[192] However, Audi has decided to not include the feature in models sold in the United States, as it believes "the existing patchwork of state regulations will make it impossible to sell the same product nationwide."[193] Similarly, why would consumers purchase a vehicle they may not be able to drive across state lines?[194]

Equally as important, without federal guidelines, manufacturers are forced to try to work within existing guidelines; thus, many innovative driverless designs, "including those central to realizing the promised benefits of the AV revolution," do not comply, thereby further stunting the growth of the technology.[195] Perhaps most importantly, federal regulations will only increase safety measures. For example, Senator John Thune urges, "Congress should act to update rules, direct manufacturers to address safety requirements and enhance the technical expertise of regulators."[196] In the meantime, the United States will continue to fall behind other nations[197] and miss out on driverless technology's many

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190 *See* SELF DRIVE Act, H.R. 3388, 115th Cong. § 6 (2017); AV START Act, S. 1885, 115th Cong. § 6 (2017).

191 *See* Stephen Edelstein, *2019 Audi A8 Won't Get Traffic Jam Pilot Driver-Assist Tech in the U.S.*, DIGITAL TRENDS (May 16, 2018), https://www.digitaltrends.com/cars/2019-audi-a8-traffic-jam-pilot-not-coming-to-us/.

192 *Id.*

193 *Id.*

194 *See* Kaveh Waddell & Kia Kokalitcheva, *States Are Sewing a Patchwork of AV Regulations*, AXIOS, https://www.axios.com/states-are-sewing-a-patchquilt-to-regulate-av-f7577b90-966c-46ef-8ab2-b616e31ab3b0.html (last updated Oct. 27, 2018) (quoting Greg Rogers, a director at Securing America's Future Energy, who proclaims, "you should be able to buy a car in California and drive it to New York").

195 Fraade-Blanar & Kalra, *supra* note 10, at 1.

196 Stone, *supra* note 187.

197 *See* Sharon Stern Gertsman, *Teaching Old Law New Tricks*, N.Y. ST. B. ASS'N J., Feb. 2018, at 5, 5 (explaining that the Chinese predict driverless cars will be on their roadways by 2020 or before); *Volvo's Self-Driving Cars Will Soon Hit the Streets in Sweden*, THE LOCAL (Sept. 14, 2018), https://www.thelocal.se/20180914/volvos-self-driving-cars-will-soon-hit-the-road-in-sweden (explaining that the Swedish government granted automaker Volvo permission to begin testing its driverless fleet on roadways in the Gothenburg area of Sweden, and how the manufacturer considers this a "positive step" toward its goal of introducing an entirely driverless fleet to roads by 2021); *see generally* Chenthan K. Srinivasa, *Who Benefits from Self-Driving Cars?*, NAT'L L. REV. (Aug. 15, 2019), https://www.natlawreview.com/article/who-benefits-self-driving-cars (indicating that benefits of self-driving cars include an increase in independence for certain populations, an easier commute for frequent drivers, heightened safety on roads, and an increase in revenue for car manufacturers).

benefits. As Representative Debbie Dingell explains: "[Driverless technology is] being built in China, it's being built in India, it's being built in Western Europe. . . . If we want to make sure that we are staying at the forefront of innovation, we've got to be doing the same thing."[198] Moreover, Congressman Greg Walden and Congressman Bob Latta caution that the delay "threatens to derail efforts for the United States to be the leader in the advancement and development of . . . potentially life-saving technology[.]"[199]

Considering both the AV START Act and SELF-DRIVE Act have the same basic mission and means to accomplish it, and their differences are so minor, either bill, or a combination of both, would be a sufficient solution. For instance, one of the key differences between the two versions is the timetable for the implementation of regulations following the DOT's recommendations.[200] While the AV START Act has a quicker timetable for implementing long-term legislation, the difference will only be about a year.[201] At this point, with over a year already passed since either bill was introduced, the difference is negligible; but regardless of which version is passed, the longer Congress delays, the longer it will be before a comprehensive regulatory scheme is adopted.[202]

In addition, while not insignificant, the difference in the levels of data privacy protection in the two bills[203] is certainly manageable. The House bill takes a very thorough approach, while the Senate's bill is more laid back but still gives consumers an idea of how their data is being used.[204] Furthermore, both solutions have unique perks: the House version lends more certainty, whereas the Senate bill seems to leave responsibilities to the current legislative scheme (which may

198 Eliza Fawcett, *Makers of Driverless Cars Want Congress to Free Them from State Safety Standards*, STAR ONLINE (July 13, 2018), https://www.thestar.com.my/tech/tech-news/2018/07/13/makers-of-driverless-cars-want-congress-to-free-them-from-state-safety-standards/.

199 Teale, *supra* note 148.

200 SELF DRIVE Act, H.R. 3388, 115th Cong. § 4(a) (2017); AV START Act, S. 1885, 115th Cong. § 4 (2017).

201 *See* H.R. 3388 § 4(a); S. 1885 § 4.

202 *See* H.R. 3388 § 12; S. 1885 § 20.

203 *See* H.R. 3388 § 12; S. 1885 § 20.

204 *See* H.R. 3388 § 12; S. 1885 § 20; *see* McCormick, *supra* note 162; *see generally* Ralph Nader, *Driverless-Car Legislation Is Unsafe at This Speed*, WALL STREET J. (Aug. 22, 2019), https://www.wsj.com/articles/driverless-car-legislation-is-unsafe-at-this-speed-1534973755 (explaining that the Senate's bill lacks sufficient cybersecurity measures, which creates a heightened risk for hacking self-driving cars).

be enough, at least for now),[205] while increasing transparency.[206] Finally, the fact that the House seeks to regulate Level 2 vehicles and the Senate's regulation begins at Level 3 should not be of major concern to either, since Level 2 vehicles are already in widespread use with no comprehensive self-driving regulation in place at all.[207]

IV. THE HURDLES

A. Tort Liability

While the expeditious implementation of driverless technology is desirable, there will certainly be hurdles to overcome once the cars hit the road. For instance, tort liability will be a major topic of debate at the state level.[208] Today, the majority of lawsuits involving car accidents are based on claims of negligence by another driver; if driver error is eliminated by autonomous vehicles, courts will be forced to grapple with the question of who is liable.[209] The language of each federal act expressly leaves this issue to the individual states to decide,[210] which allows the NHTSA to maintain its goal of leaving tort matters to the state courts.[211] Thus, states will likely develop intrastate autonomous vehicle liability standards through the common law court system, regardless of whether or not a federal framework is in place.[212]

Presently, no case law exists to guide courts in handling questions of liability in driverless accidents.[213] Nevertheless, with exhaustive tort liability common law and pre-existing tort liability models already in place, the states are more than able to confront these issues of first impression.[214] One model that is expected to be effective during the driverless revolution is the "no fault"

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205 *See generally* Chasel Lee, *Grabbing the Wheel Early: Moving Forward on Cybersecurity and Privacy Protections for Driverless Cars*, 69 FED. COMM. L. J. 25, 35-39 (2017) (explaining that while current regulations surrounding cybersecurity are ambiguous, congressmen have been advocating for more stringent cybersecurity laws to respond to evolving technology).

206 *See* AV START Act, S. 1885, 115th Cong. § 20 (2017).

207 Horaczek, *supra* note 39.

208 *See, e.g.*, Levy, *supra* note 21, at 380; *see also* King, *supra* note 21, at 134.

209 Mark Geistfeld, *A Roadmap for Autonomous Vehicles: State Tort Liability, Automobile Insurance, and Federal Safety Regulation*, 105 CAL. L. REV. 1611, 1691 (2017).

210 *See* SELF DRIVE Act, H.R. 3388, 115th Cong. § 3(e) (2017); AV START Act, S. 1885, 115th Cong. § 3(b) (2017).

211 Geistfeld, *supra* note 209, at 1676.

212 King, *supra* note 21, at 159.

213 Geistfeld, *supra* note 209, at 1691.

214 *See generally* Levy, *supra* note 21 (explaining common law tort liability law need not be altered on account of driverless cars taking the roads).

system.[215] Twelve states have already adopted this system, in which parties are unable to sue unless damages reach a monetary threshold.[216] If extended to driverless automobiles, this system could cut costs for insurers as less time and resources would need to be spent on post-accident investigations and litigation; as a result, larger sums would no longer need to be paid out to aggrieved parties.[217] Regardless of the liability structure of each state, local courts can develop liability law incrementally using fact intensive analysis.[218] For early cases, courts can also look to precedent involving other types of technology and transportation, such as elevators, existing autopilot systems, or even horse travel, and create their own tort law by using these kinds of cases as a starting point.[219] The bottom line is that models do exist that will work in a driverless era, and state tort law, which is "perpetually in flux,"[220] is more than able to deal with evolving issues of first impression.

As an aside, nothing prevents the federal government from stepping in to assist states when complex legal questions arise.[221] Thus, the federal government can monitor and provide guidance, as needed, to state courts to help them establish minimum and reasonable standards for manufacturers, as well as simplify tort claims through legislation and the NHTSA.[222] While it is unknown which route individual states will take, thanks to the explicit wording of the relevant acts and the mission of the NHTSA,[223] manufacturers will at least know for planning purposes that liability will largely be dictated at the state level.[224]

Drivers will also still have an opportunity to bring suits against automobile manufacturers for defects in manufacturing and design, as well as for typical negligence.[225] Much of existing negligence common law, such as assumption of the risk, waiver, and comparative negligence, could accommodate suits between drivers and manufacturers, at least in certain situations.[226] While good for maintaining the status quo and providing ease in the transition to automated vehicles, driver recourse against manufacturers is not without its hurdles. In fact,

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215 *Id*. at 377; *see* Maurice Schellekens, *No-Fault Compensation Schemes for Self-Driving Vehicles*, 10 L., INNOVATION AND TECH. 314, 314 (2018).

216 Levy, *supra* note 21, at 377.

217 *Id*.

218 King, *supra* note 21, at 127.

219 *Id*.

220 Kyle Graham, *The Diffusion of Doctrinal Innovations in Tort Law*, 99 MARQ. L. REV. 75, 76 (2015).

221 *See* U.S. CONST. art. IV, § 1.

222 *See* Geistfeld, *supra* note 209, at 1676.

223 Geistfeld, *supra* note 209, at 1674.

224 *See* SELF DRIVE Act, H.R. 3388, 115th Cong. § 3(e) (2017); AV START Act, S. 1885, 115th Cong. § 3(b) (2017).

225 *See* Levy, *supra* note 21, at 377.

226 *See id.* at 358, 383-85.

there are concerns that product liability cases may be so plentiful that they will hinder the design and development of driverless technology.[227] However, manufacturers can and should take a proactive approach to avoid this outcome.[228] The steps manufacturers can take include: creating risk management programs for when litigation does arise, going above and beyond the minimum safety standards, collaborating and pooling resources with other similarly situated manufacturers to increase safety standards, and purchasing their own liability insurance.[229]

While product liability is an obvious threat to the development of driverless technology, and tort liability in general will create some initial confusion, these are also areas where new legislation need not be introduced thanks to the existing tort law and legislatives schemes found in some states.[230] Thus, consumers are already afforded an opportunity to seek legal recourse when they are injured, which incentivizes manufacturers to create safe vehicles.[231] Here, a patchwork of state laws is acceptable because tort liability is within the purview of the state courts, a fact that legislators in the House and Senate have both realized.[232] Therefore, while the state courts will have to grapple with these issues, they should not inhibit the expeditious passage of federal legislation that paves the way for automated vehicles.[233]

B. Insurance Industry

With fewer accidents occurring, some project a steep decline in revenue for insurance companies.[234] In 2016, personal automobile insurance boasted the largest share of the American insurance market.[235] Mandatory coverage

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227 STEPHEN S. WU, PRODUCT LIABILITY ISSUES IN THE U.S. AND ASSOCIATED RISK MANAGEMENT 576 (A.B.A. 2015), https://www.americanbar.org/content/dam/aba/administrative/science_technology/2016/autonomous_driving_product_liability_chapter.pdf ("Crippling suits could force manufacturers to exit the market and may deter some manufacturers from entering the market because of a belief that the sales are not worth the risk.").

228 *See id.* at 588-90.

229 *See id.* at 588, 590.

230 Levy, *supra* note 21, at 366–68.

231 *See generally* John Villasenor, *Products Liability and Driverless Cars: Issues and Guiding Principles for Legislation*, BROOKINGS (Apr. 11, 2014), https://www.brookings.edu/research/products-liability-and-driverless-cars-issues-and-guiding-principles-for-legislation/.

232 Stone, *supra* note 187.

233 *See generally* Villasenor, *supra* note 231 (arguing that state tort laws can and should adapt to the new challenges of autonomous vehicles).

234 Sellwood, *supra* note 22, at 864.

235 Julia A. Molander & Yevgenia A. Wiener, *Driverless Vehicles and the Effect on Insurance*, FOR THE DEFENSE, May 2016, at 16, 20.

minimums vary widely by state.[236] When accidents decline, the market will demand lower personal insurance premiums, resulting in decreased earnings for providers.[237] By one estimate, the insurance industry stands to lose up to 80 percent of its revenue as a result.[238] After all, if Level 5 automation comes to fruition, most accidents will be shown to not be the fault of the drivers.[239] Thanks to this fact, in the short term, insurance companies may struggle to calculate profitable premiums for consumers due to the difficulties of projecting future losses.[240] In addition, as different situations arise, such as defects in the computer or manufacturing of the car, difficulties will stem from confusion over who should be held liable.[241]

Despite the issues that will arise, there is reason to believe that with a little flexibility, insurance companies will survive the driverless revolution. In the short term, insurance companies may be able to increase rates, thanks to the unpredictability that may ensue from a transition period during which driverless automobiles share the roads with manned vehicles.[242] In the long term, product liability insurance is one area where insurers can reasonably expect to expand their reach.[243] Automobile manufacturers purchase product liability insurance to protect themselves in the event of litigation stemming from defective parts or vehicle manufacturing. [244] The premiums on this type of insurance should increase thanks to the probability that a higher percentage of lawsuits will name the manufacturer, rather than the motorist, as the defendant.[245] Manufacturers will then conduct their own cost-benefit analyses as to whether the development

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236 *See* Penny Gusner, *Minimum Car Insurance Requirements*, INSURE.COM, https://www.insure.com/car-insurance/minimum-coverage-levels.html (last updated Dec. 12, 2017) (providing a searchable repository of the state minimum car insurance requirements).

237 Molander & Wiener, *supra* note 235.

238 Leslie Scism, *Driverless Cars Threaten to Crash Insurers' Earnings*, WALL STREET J. (Mar. 7, 2009), https://www.wsj.com/articles/driverless-cars-threaten-to-crash-insurers-earnings-1469542958 ("Car insurers last year hauled in $200 billion of premiums, about a third of all premiums collected by the property-casualty industry. But as much as 80% of the intake could evaporate in coming decades, say some consultants, assuming crucial breakthroughs in driverless technology make driving safer and propel big changes in car ownership.").

239 Hasan Siddiqui, *Gone in Sixty Seconds: Fading Automobile Insurance Costs in a Driverless Future*, 2018 U. ILL. J. L. TECH. & POL'Y. 221, 234 (2018).

240 Hagan, *supra* note 21; *see* Robert W. Peterson, *New Technology—Old Law: Autonomous Vehicles and California's Insurance Framework*, 52 SANTA CLARA L. REV. 1341, 1345, 1364 (2012).

241 *See* Siddiqui, *supra* note 239, at 229.

242 *Id.* at 243.

243 Hagan, *supra* note 21.

244 *Id.*

245 *Id.*

of the technology is worth the higher premiums.[246] Furthermore, the possibility of higher premiums will likely encourage manufacturers to design safer products, an obvious benefit to American consumers.[247]

Along the same line, the prospect of low or de minimis car insurance premiums would be highly desirable for American consumers.[248] Proponents of autonomous technology envision a day when consumers will be traveling in safer vehicles and saving capital they would ordinarily have to pay in premiums.[249] So, while the insurance industry can certainly expect to suffer some setbacks, it should nevertheless survive, and its losses will be to the benefit of the American consumer.[250]

C. Data Privacy

Automated vehicles will be highly computerized, and for their benefits to be fully realized, data will need to be collected, stored, and shared with other vehicles and companies.[251] Thus, concerns exist as to how automated vehicles will affect the data privacy landscape.[252] Indeed, data sharing from vehicles is already a big business; as the automated driving proponent 2025 AD reported: "In 2017, for the first time, there were more cars added to cellular networks in the [United States] than phones."[253] Car data monetization is projected to net between $450 and $750 billion by the year 2030 over an array of different industries.[254] With such a large market for data, issues are certain to arise. For instance, will police be able to bypass the requirement of obtaining a warrant to track a car using GPS[255] and simply subpoena the companies providing the GPS services for their records?[256] Advertising will almost certainly play a role in data

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246 Schroll, *supra* note 48, at 821.

247 *See generally* King, *supra* note 21, at 134 (explaining that autonomous vehicle user risk awareness can help mitigate crash risks).

248 *See generally id.*

249 *See generally id.*

250 *See generally id.*

251 Riehl, *supra* note 24, at 290 ("Automation's benefits include a vehicle's ability to take users on the most-efficient routes, as well as the vehicles' communication with other vehicles to both expedite trips and increase safety.").

252 *Id.*

253 *Infographic: Data Privacy and Connected Cars*, 2025 AD, https://www.2025ad.com/infographic-data-privacy-and-connected-cars (last visited Nov. 15, 2019).

254 *Id.*

255 *See* United States v. Jones, 565 U.S. 400, 404-05 (2012) (holding that police installing a GPS tracking device on a suspect's car constituted a "search" under the Fourth Amendment in part due to the physical nature of the installation).

256 Riehl, *supra* note 24, at 290 (questioning police bypassing warrant requirements to track a car's GPS).

privacy as well.[257] Will location data be packaged and sold, so when a driver buckles up, his or her dashboard displays recommendations for which advertiser he or she should visit based on previous stops?[258] Will drivers be encouraged by advertisers to stop at certain locations during their trips?[259] All of these questions raise valid concerns about the data privacy landscape surrounding automated vehicles.

While the United States' approach to data privacy law has its shortcomings and has been the subject of criticism,[260] it is actually well tailored to deal with a driverless world. Even if the Senate bill, which has a more laid-back approach to data privacy, is adopted, United States common law would be able to handle data privacy issues until a more comprehensive federal solution is implemented.[261] The United States uses a sectoral model to regulate the intersection of business and consumer data, predominated by self-regulation within industries and oversight by the FTC, with Congress offering only a few "narrowly tailored" laws that barely infringe on the self-regulatory system.[262] Despite the criticism, the self-regulatory system has allowed the automobile industry to get ahead of the consumer data privacy issue.[263] In 2014, nearly all automakers agreed to abide by a set of principles that the FTC can use to hold them accountable.[264] As data privacy expert Lauren Smith explains, under this system, manufacturers "need to get the customer's consent before using sensitive data for marketing or before sharing it with unaffiliated third parties

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257 Ramsi A. Woodcock, *The Obsolescence of Advertising in the Information Age*, 127 YALE L.J. 2270, 2341 (2018) (discussing advertising and data privacy).

258 Riehl, *supra* note 24, at 290 (explaining an advertising company's business plan might include leveraging automated driving by advertising nearby services).

259 *Id.*

260 Bradyn Fairclough, *Privacy Piracy: The Shortcomings of the United States' Data Privacy Regime and How to Fix It*, 42 J. CORP. L. 461, 463 (2016) ("Many have criticized the self-regulated model as being ineffective and laden with conflicts of interest because it asks businesses to regulate themselves when loose regulation could mean a much larger profit."); Yaki Faltelson, *Data Privacy Disruption in the U.S.*, FORBES (Dec. 12, 2018), https://www.forbes.com/sites/forbestechcouncil/2018/12/12/data-privacy-disruption-in-the-u-s/#5b920d4515cc.

261 Susan McGregor & Hugo Zylberberg, *Understanding the General Data Protection Regulation: A Primer for Global Publishers*, COLUM. JOURNALISM REV. (Mar. 7, 2018), https://www.cjr.org/tow_center_reports/understanding-general-data-protection-regulation.php.

262 Fairclough, *supra* note 260, at 463.

263 Lauren Smith, *Data Privacy: "It's Time to Treat Your Car like Your Smartphone,"* 2025 AD, https://www.2025ad.com/updates/driverless-cars-data-privacy-lauren-smith/ (last visited Nov. 15, 2019).

264 MAUREEN K. OHLHAUSEN, FED. TRADE COMM'N, THE INTERNET OF EVERYTHING: DATA, NETWORKS & OPPORTUNITIES 12 (2015), https://www.ftc.gov/system/files/documents/public_statements/804001/150922remarkscommmko.pdf.

for their own use."[265]

Furthermore, just like issues in tort, concerns about police use of driverless car data will be addressed in the courts using existing law. Recent litigation actually leads one to believe that it will be difficult for police to obtain information about the locations of suspects while sidestepping warrant requirements.[266] For instance, in *Carpenter v. United States*, the Supreme Court held that the police obtaining data collected by cell phone towers that had interacted with a robbery suspect's phone, without a warrant, constituted an unlawful search under the Fourth Amendment.[267] Justice Roberts explained:

> Given the unique nature of cell phone location records, the fact that the information is held by a third party does not by itself overcome the user's claim to Fourth Amendment protection. Whether the Government employs its own surveillance technology … or leverages the technology of a wireless carrier, we hold that an individual maintains a legitimate expectation of privacy in the record of his physical movements as captured through [cell phone tracking]. The location information obtained from Carpenter's wireless carriers was the product of a search.[268]

It is difficult to envision a situation where this holding would not extend to data collected by autonomous vehicles.[269] In the hypothetical situation where the police seek tracking data of drivers, they will need to acquire it from a third party, and under *Carpenter*, this is likely to constitute a search and will require a warrant.[270]

V. CONCLUSION

While automobile manufacturers still need to make strides before driverless technology is perfected, the revolution is imminent. The few hurdles standing in the way of implementation of the technology pale in comparison to the incredible benefits it offers. Americans stand to gain a safer mode of transportation, better quality of life, cleaner environment, and an influx of

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265 Smith, *supra* note 263; ALL. OF AUTO. MFRS., INC., CONSUMER PRIVACY PROTECTION PRINCIPLES 8 (2014), https://autoalliance.org/wp-content/uploads/2017/01/Consumer_Privacy_Principlesfor_VehicleTechnologies_Services-03-21-19.pdf.

266 *See* Carpenter v. United States, 138 S. Ct. 2206, 2217 (2018); United States v. Jones, 565 U.S. 400, 429 (2012).

267 *Carpenter*, 138 S. Ct. at 2217.

268 *Id.*

269 CHELSEY COLBERT, PRIVACY UNDER THE HOOD: TOWARDS AN INTERNATIONAL DATA PRIVACY FRAMEWORK FOR AUTONOMOUS VEHICLES 6 (2018), https://conferences.law.stanford.edu/werobot/wp-content/uploads/sites/47/2018/02/Privacy-Under-the-Hood-Towards-an-International-Data-Privacy-Framework-for-Autonomous-Vehicles.pdf.

270 *Carpenter*, 138 S. Ct. at 2217.

employment and economic benefits. Congress has already taken many of the steps necessary to fashion a quality legislative solution that will help aid in the development and implementation of this life-saving technology. While there are differences between the House and Senate proposals, they are minor, and simple fixes are available to marry the two. With most of the work completed, Congress needs to act quickly because the clock is ticking. Each day comprehensive federal legislation stalls, lives are lost, the regulatory environment is further confused, and America falls further behind other nations in the race to driverless technology. Allowing political differences to stand in the way of progress is an ongoing injustice dealt to the American people by the very lawmakers they elected.