Barry Law Review

Volume 22 | Issue 1 Article 1

2-21-2017

Self-Driving Cars: Autonomous Technology that Needs a Designated Duty Passenger

Michelle L.D. Hanlon

SELF-DRIVING CARS: AUTONOMOUS TECHNOLOGY THAT NEEDS A DESIGNATED DUTY PASSENGER

Michelle L.D. Hanlon[*]

I. INTRODUCTION

> How will you use the extra time you'll have when your car starts to drive itself? Relax with a newspaper? Meet those last-minute deadlines? Or read a story to the kids? What's more, you won't even need to stay in your car when it's time to park it—you can leave it to find its own vacant spot and park by itself.[1]

Did that get your attention? Volvo Car Corporation ("Volvo") certainly hopes so. This seductive language features prominently on a website the company has dedicated to its IntelliSafe Autopilot.[2] That same website modestly proclaims that IntelliSafe Autopilot will "change the world."[3] How? According to the materials distributed by Volvo, autonomous vehicles will save us time, fuel, frustration, and insurance premiums—not to mention the added benefit of safety.[4]

You do not need to be a lawyer to recognize that things can easily go horribly wrong. When there is an accident involving an autonomous car, who is to blame? Volvo purports to have the answer. In October 2015, Volvo Car Group President and CEO Håkan Samuelsson announced that Volvo would "accept full liability whenever one of its cars is in autonomous mode."[5]

This is a bold, and some might say foolhardy, statement. Volvo (and others) believes that computer drivers are safer than human ones and that the incident of accidents will be greatly reduced, assuring minimum exposure for the car company.[6] Moreover, it can be argued that this seemingly beneficent acceptance of

* Michelle L.D. Hanlon is a partner at éClat Law, LLP. She earned her J.D. magna cum laude from the Georgetown University Law Center and her B.A. in Political Science from Yale College. She has been in private practice for more than twenty years. Focused on the relationship between law and emerging and evolving technologies, she is currently pursuing an LL.M. in Air and Space Law at McGill University.

1. *IntelliSafe Autopilot*, Volvo, http://www.volvocars.com/intl/about/our-innovation-brands/intellisafe/intellisafe-autopilot (last visited Oct. 1, 2016).

2. *See id.*

3. *See id.*

4. *See Self-Driving Cars*, VOLVO, http://www.volvocars.com/intl/about/our-innovation-brands/intellisafe/intellisafe-autopilot/changing-the-world (last visited Oct. 2, 2016) (stating that the Volvo Car Corporation specifically cites six ways that "autonomous driving will improve your life": time reclamation, fuel savings, greater safety, more time to relax, "always find a parking space," and "lower insurance premiums").

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

6. *See* Corinne Iozzio, *Who's Responsible When a Self-Driving Car Crashes?*, SCI. AM. (May 1, 2016), http://www.scientificamerican.com/article/who-s-responsible-when-a-self-driving-car-crashes/.

liability merely acknowledges the reality of current product liability law.[7] Nevertheless, one shudders to think of the inevitable blossom of common law detailing when, exactly, a car is in "autonomous mode," and when an accident is due to human interference with the safety-prone machinery. And, what happens when the autonomous driving software is faced with the "damned if you do, damned if you don't" Trolley Problem? Do we want to rely upon an algorithm to decide between killing three joggers or five octogenarians?[8]

We cannot pretend that Volvo-like pronouncements will smoothly pave the way to an era of safe self-driving vehicles. Nor should we cede to our already overburdened courts the entire responsibility of safely and sensibly sanctioning the use and proliferation of self-driving cars on our roads. Self-driving technology is a good thing, and state legislatures have a duty to assure its success and acceptance. A first step, of course, is to expressly authorize the operation of autonomous vehicles on public roads within the state, something, as of this writing, only eight states have done.[9] But in order to help firmly root the nascent self-driving vehicle industry and allow it to flourish, states must be willing to codify a liability standard that will protect consumers and bystanders, while not unduly restricting the nascent autonomous vehicle industry. This article suggests that state legislatures adopt laws removing traditional passivity and affirmatively placing a duty on at least one of the passengers—the Designated Duty Passenger[10]—of self-driving cars to control the conduct of the driver, in this case, the car itself.

Part II of this article discusses the benefits of self-driving cars—without Volvo's hyperbole—and why society should embrace them. Part III recounts the accidents of autonomous vehicles to date. Part IV introduces the concept of the Designated Duty Passenger, arguing, with reliance on Florida common law, that using a driverless car is conduct that "creates a foreseeable zone of risk"[11] and places a duty on passengers to "see that sufficient precautions are taken to protect

7. *See* John Villasenor, *Products Liability and Driverless Cars: Issues and Guiding Principles for Legislation*, CTR. FOR TECH. INNOVATION AT BROOKINGS (Apr. 2014), https://www.brookings.edu/wp-content/uploads/2016/06/Products_Liability_and_Driverless_Cars.pdf; *see also Moral Machine,* MIT, moralmachine.mit.edu (last visited Oct. 2, 2016) (showcasing a fascinating, and perhaps slightly addictive, platform that allows you to make moral judgments on behalf of a self-driving care in various scenarios).

8. This philosophical debate is far beyond the bounds of this article. For more on Trolley Problem, see Nick Belay, *Robot Ethics and Self-Driving Cars: How Ethical Determinations in Software Will Require a New Legal Framework*, 40 J. LEGAL PROF. 119, 121–22 (2015). *See also* Steven M. Sweat, *The Moral Dilemma for Self-Driving Cars*, THE NAT'L L. REV. (July 15, 2016), http://www.natlawreview.com/article/moral-dilemma-self-driving-cars ("[P]eople may be less willing to purchase these vehicles if they are programmed to save the greatest number of lives rather than the lives of the purchasers and their families."); *Moral Machine*, *supra* note 7.

9. *See Autonomous Self-Driving Vehicles Legislation*, NAT'L CONFERENCE OF STATE LEGISLATURES, http://www.ncsl.org/research/transportation/autonomous-vehicles-legislation.aspx (last visited Oct. 2, 2016) (noting that only Nevada, California, Florida, Louisiana, Michigan, North Dakota, Tennessee, Utah, and Washington, D.C. have passed legislation related to autonomous vehicles).

10. I have adopted the term "Designated Duty Passenger" purely for illustrative purposes. When a vehicle is in self-driving mode, the human operator is not technically the "driver" and thus becomes a "passenger." The word "duty" reminds that far from being a passive bystander, the passenger has a duty to remain vigilant of surrounding circumstances. "Designated" reminds that there will soon be situations where fully autonomous cars have multiple passengers. In these situations, at least one should be "designated" to accept the duty. Given the statutory scheme discussed in Part V, at least one passenger should be endorsed by the state to operate a self-driving vehicle.

11. *See* McCain v. Fla. Power Corp., 593 So. 2d 500, 503 (Fla. 1992).

others from the harm that risk poses."[12] Lastly, Part V provides model statutory language necessary to successfully codify and implement the Designated Duty Passenger scheme.

II. WHY WE WANT SELF-DRIVING CARS

Self-driving cars are poised to usher in a new world order wherein the incidents of vehicular accidents are greatly reduced, saving lives and costs associated with both property damage and injury; fuel efficiency soars; and productivity snowballs.

A. Self-Driving Cars Save Lives

According to the National Highway Traffic Safety Administration, there were an estimated 35,200 motor vehicle traffic fatalities in 2015.[13] That equates to 1.12 fatalities per 100 million vehicle miles traveled[14] or one fatality for every 89.2 million miles. As of August 7, 2016, there had been one reported fatality involving a self-driving car.[15] According to Elon Musk, whose company Tesla Motors, Inc. manufactured the vehicle in question, it was the first known fatality occurring in just over 130 million self-driving miles.[16] Bryant Walker Smith, writing in a blog for the Stanford Law School Center for Internet and Society, estimates that "[s]ome ninety percent of motor vehicle crashes are caused at least in part by human error."[17] That means taking the easily-distracted human out of the equation could have saved 31,680 lives last year alone.

Moreover, having a robot controlling the wheel will make any accidents that do occur less severe:

> "If you have something react faster than humans, even if it can't completely avoid a crash, you could still save lots of lives. . . ." A robot car can still get rear-ended by a human-driven car, for example, but its sensors could detect the pending collision and maneuver the car quickly to lengthen the distance before impact.[18]

12. *See id.* (citing Kaisner v. Kolb, 543 So. 2d 732, 735 (Fla. 1989) (citations omitted)).
13. *See Early Estimate of Motor Vehicle Traffic Fatalities in 2015*, U.S. DEP'T OF TRANSP. (July 2016), http://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812269.
14. *See id.*
15. *See* Anjali Singhvi & Karl Russell, *Inside the Self-Driving Tesla Fatal Accident*, N.Y. TIMES (July 12, 2016), http://www.nytimes.com/interactive/2016/07/01/business/inside-tesla-accident.html.
16. *See* The Tesla Team, *A Tragic Loss*, TESLA (June 30, 2016), https://www.tesla.com/blog/tragic-loss.
17. *See* Bryant Walker Smith, *Human Error as a Cause of Vehicle Crashes*, CTR. FOR INTERNET AND SOC'Y (Dec. 18, 2013), http://cyberlaw.stanford.edu/blog/2013/12/human-error-cause-vehicle-crashes.
18. Ucilia Wang, *Self-Driving Cars Are Coming, and the Technology Promises to Save Lives*, THE GUARDIAN (Dec. 17, 2015, 13:47), https://www.theguardian.com/technology/2015/dec/17/self-driving-cars-safety-future-interactive.

According to a McKinsey study, "Since self-driving cars could eliminate human driver error and be less likely to crash, not only would death and injury rates fall, but property savings would add up to $190 billion in the U.S. alone."[19]

B. Self-Driving Cars Save Fuel—and the Environment

Concern has been voiced that the production of autonomous vehicles will actually encourage more people to drive and thus increase carbon emissions[20] and greenhouse gas production.[21] The theory is that given the choice between what will essentially be a chauffeur experience in a private car and a crowded commuter train or bus, people will choose the former.[22] Compounding this preference for privacy is the worry that "if people don't have to pay attention during their commute and can read the paper or play on their phone instead they might decide to live farther away from their workplace."[23]

But studies have shown that "[a]utomation could deliver around 15% in fuel savings"[24] because "[s]o much fuel waste comes from inefficient driving itself."[25] Not surprisingly, in addition to being less prone to human error, machines are more efficient and consistent than people.[26]

> Starting and stopping wastes fuel. Gunning it at green lights or slamming on the brakes wastes fuel. Driving too fast—above 55 mph—greatly decreases fuel efficiency. Think of how much fuel in your life you have wasted because someone who suddenly remembered they had to turn, blocked traffic by trying to switch lanes and you had to slam on the breaks.[27]

Not to mention those multiple attempts required by those of us who are challenged by the angles of parallel parking.[28] Indeed, the more self-driving is adopted, the more efficient our roads will become as a whole.[29] A Goldman Sachs research note

19. Chris Woodyard, *McKinsey Study: Self-Driving Cars Yield Big Benefits*, USA TODAY (Mar. 5, 2015, 3:57 AM), http://www.usatoday.com/story/money/cars/2015/03/04/mckinsey-self-driving-benefits/24382405/.
20. *See* Julia Pyper, *Self-Driving Cars Could Cut Greenhouse Gas Pollution*, SCI. AM. (Sept. 15, 2014), http://www.scientificamerican.com/article/self-driving-cars-could-cut-greenhouse-gas-pollution/.
21. *See* Steve Hanley, *Autonomous Cars Might Actually Increase Greenhouse Gas Emissions*, GAS2 (Feb. 26, 2016), http://gas2.org/2016/02/26/autonomous-cars-might-actually-increase-green-house-gas-emissions/.
22. *See* Pyper, *supra* note 20.
23. *Id.*
24. *See* Jason Bordoff, *How Driverless Cars Could End up Harming the Environment*, WALL ST. J. (Apr. 27, 2016, 11:47 AM), http://blogs.wsj.com/experts/2016/04/27/how-driverless-cars-might-actually-harm-the-environment/.
25. *See* Tao Lin, *How Self-Driving Cars Will Increase Fuel Efficiency and Decrease Waste*, MOVIMENTO (Feb. 3, 2016), http://movimentogroup.com/blog/how-self-driving-cars-increase-fuel-efficiency-decrease-waste/.
26. *See* Bordoff, *supra* note 24.
27. *See* Lin, *supra* note 25.
28. *See How to Parallel Park*, DMV, http://www.dmv.org/how-to-guides/parallel-parking.php (last visited Nov. 11, 2016).
29. *See* Lin, *supra* note 25; Woodyard, *supra* note 19.

expects that a generous proliferation of autonomous cars can "increase fuel economy by 31% due to smoother traffic flows . . . ."[30]

In addition, committed proponents of self-driving cars are also committed proponents of ride-sharing.[31] Ride-sharing has already proven popular.[32] And a generation that has grown up with Zipcar, Uber, Lyft, and Sidecar has already demonstrated a marked indifference to car ownership.[33] In fact, "[f]rom 2007 to 2011, the number of cars purchased by people aged 18 to 34, fell almost 30% . . . ."[34] Capitalizing on this trend, Elon Musk plans to create a "shared fleet" of Teslas that will not only lower the cost of car ownership but reduce the amount of cars on the road.[35]

> You will be able to add your car to the Tesla shared fleet just by tapping a button on the Tesla phone app and have it generate income for you while you're at work or on vacation, significantly offsetting and at times potentially exceeding the monthly loan or lease cost.[36]

In short, it is not irrational to assume that the increase in self-driving cars will ultimately lead to an overall decrease in vehicles on the road.

Once driver automatons are widely adopted, it is anticipated that "platooning," where a group of cars travel together in a pod, will also result in an increase in fuel efficiency of at least twenty percent due to lower air drag.[37]

Finally, since self-driving cars could drop off passengers and then park themselves, standard parking spaces can be made narrower as no space is needed to allow driver or passenger doors to open. "That could free up 6.8 billion square

30. *Monetizing the Rise of Autonomous Vehicles*, GOLDMAN SACHS, Cars 2025: Vol. 3, at 57 (Sept. 2015), http://pg.jrj.com.cn/acc/Res/CN_RES/INVEST/2015/9/17/f70472c6-f4ad-4942-8eab-3c01f3c717a7.pdf.

31. *See generally* Max Chafkin, *Uber's First Self-Driving Fleet Arrives in Pittsburgh This Month*, BLOOMBERG (Aug. 18, 2016), http://www.bloomberg.com/news/features/2016-08-18/uber-s-first-self-driving-fleet-arrives-in-pittsburgh-this-month-is06r7on (discussing the self-driving pilot plan introduced in Pittsburgh); *see also* Marco della Cava, *U.S. Aims to Tame 'Wild West' of Self-Driving Cars*, USA TODAY (Sept. 21, 2016, 2:05 PM), http://www.usatoday.com/story/tech/news/2016/09/20/us-aims-tame-wild-west-self-driving-cars/90750232/.

32. *See* Jay Sethna, *Why Ridesharing Is More than a Transportation Trend*, CONCUR (Nov. 10, 2015), https://www.concur.com/newsroom/article/why-ridesharing-is-more-than-a-transportation-trend.

33. *See* Darren Ross, *Millennials Don't Care About Owning Cars, and Car Makers Can't Figure Out Why*, COEXIST (Mar. 26, 2014), https://www.fastcoexist.com/3027876/millennials-dont-care-about-owning-cars-and-car-makers-cant-figure-out-why.

34. *Id.*

35. *See* Cadie Thompson, *The 5 Key Parts of Elon Musk's 'Master Plan' for Tesla*, BUS. INSIDER (July 21, 2016, 9:05 AM), http://www.businessinsider.com/elon-musk-tesla-master-plan-part-deux-explained-2016-7/#tesla-will-launch-at-least-two-more-vehicles-in-addition-to-the-model-3-2.

36. *Id.*

37. *See* Stephen Shankland, *Platooning: The Future of Freeways Is Lining up*, CNET (Sept. 3, 2016, 8:44 AM), https://www.cnet.com/news/platooning-the-future-of-freeways-is-lining-up/; *see also* SARTRE PROJECT, http://www.sartre-project.eu/en/Sidor/default.aspx (last visited Oct. 18, 2016) ("[A] lead vehicle with a professional driver will take responsibility for a platoon. Following vehicles will enter a semi-autonomous control mode that allows the driver of the following vehicle to do other things that would normally be prohibited for reasons of safety; for example, operate a phone, reading a book or watching a movie.").

yards in the U.S. that is currently being used for parking lots—the equivalent of the Grand Canyon and Zion national parks combined . . . ."[38]

C. Self-Driving Cars Increase Human Productivity

Of course, the ultimate consumer benefit is being able to safely take your eyes off the road and use driving time for other purposes.[39] "Instead of staring at the blacktop, worrying about the right exit ramp, wondering whether the incoming call or text is important, commuters are free to catch up on work, more sleep, the show they missed last night, or the latest deals online."[40]

In an attempt to approximately monetize this time, Goldman Sachs segmented "potential activities into three categories: working, sleeping/resting/other, and leisure."[41] Analysts

> then applied the percentage of time spent on average per person each day based on data from the US Department of Labor and allocated it into the three categories . . . . Afterwards, [they] determined the total number of hours spent per year in a vehicle per driver and allocate[d] the total number of hours to each category, breaking out the percentage of workers who cannot perform their job duties in a vehicle (i.e., construction, hospitality, et cetera).[42]

A dollar value ranging from $0.70 to $31.10 per hour was assigned for each hour of each category, with $0.00 assigned for sleeping.[43] As a result, Goldman Sachs estimates that the ability to work remotely in a vehicle represents a benefit of $177 billion annually.[44] This number does not take into account the positive health benefits of the reduction of stress produced by traffic.[45] Combining these benefits, Ravi Shanker, a Morgan Stanley analyst covering the U.S. auto industry, suggests that "autonomous cars could contribute $1.3 trillion in annual savings to the U.S. economy alone, with global savings estimated at over $5.6 trillion."[46]

---

38. *See* Woodyard, *supra* note 19.
39. *See The Ultimate Information Guide to Understand Self-Driving Autonomous Cars*, AUTO. TECH., http://www.automotivetechnologies.com/autonomous-self-driving-cars (last visited Nov. 12, 2016).
40. *Autonomous Cars: The Future Is Now*, MORGAN STANLEY (Jan. 23, 2015), http://www.morganstanley.com/articles/autonomous-cars-the-future-is-now.
41. *See Monetizing the Rise of Autonomous Vehicles*, *supra* note 30, at 60.
42. *See id.*
43. *See id.* at 60–61.
44. *See id.*
45. *See* Todd Alexander Litman, *Autonomous Vehicle Implementation Predictions: Implications for Transport Planning*, VICTORIA TRANSP. POLICY INST. (Sept. 1, 2016), http://www.vtpi.org/avip.pdf; *see also* Elizabeth Landau, *Can You Believe This Traffic? Health Consequences of a Long Commute*, CNN (Nov. 24, 2012, 1:36 PM), http://www.cnn.com/2012/11/19/health/driving-traffic-commute-consequences/.
46. *See Autonomous Cars*, *supra* note 40.

D. Self-Driving Cars Are Not Going Away

For all these reasons, it is becoming apparent that self-driving vehicles are not—and should not—go away any time soon. U.S. Secretary of Transportation, Anthony Foxx, announced in January 2016 a "10 year, nearly $4 billion investment to accelerate the development and adoption of safe vehicle automation through real-world pilot projects."[47] Indeed, the conclusion of Goldman Sachs, Morgan Stanley, McKinsey, and many others is that we can expect autonomous vehicles to be common if not predominant, by 2025.[48] *Business Intelligence* predicts there will be 10 million cars with self-driving features on the roads by 2020.[49] At least thirty-three corporations are involved in developing autonomous vehicles,[50] and the market itself is "predicted to grow to $87 billion by 2030."[51]

III. SELF-DRIVING CAR ACCIDENTS

A. The Current Landscape

The current landscape certainly suggests that self-driving cars are safe and supports the idea that they are safer than their human-driven counterparts. There are a number of companies testing self-driving car technology on public roads.[52]

- "Google started testing self-driving cars in 2009."[53] The first such cars, unleashed on California roads, were Toyota Priuses, "outfitted with customized software and hardware."[54] These were shortly followed by Lexus SUVs and, in May 2015, by "its own custom-designed self-driving cars."[55] As of July 2016,

47. *See 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*, NAT'L HIGHWAY TRAFFIC SAFETY ADMIN. (Jan. 14, 2016), https://www.transportation.gov/briefing-room/secretary-foxx-unveils-president-obama%E2%80%99s-fy17-budget-proposal-nearly-4-billion.

48. *See Monetizing the Rise of Autonomous Vehicles*, *supra* note 30, at 17–18; *see also Shared Mobility on the Road of the Future*, MORGAN STANLEY (June 15, 2016), http://www.morganstanley.com/ideas/car-of-future-is-autonomous-electric-shared-mobility; Woodyard, *supra* note 19.

49. *See* John Greenough, *10 Million Self-Driving Cars Will Be on the Road by 2020*, BUS. INSIDER (June 15, 2016, 7:25 AM), http://www.businessinsider.com/report-10-million-self-driving-cars-will-be-on-the-road-by-2020-2015-5-6.

50. *See 33 Corporations Working on Autonomous Vehicles*, CB INSIGHTS (Aug. 11, 2016), https://www.cbinsights.com/blog/autonomous-driverless-vehicles-corporations-list/. The companies listed are: Apple, Audi, Baidu, BMW, Bosch, Daimler, DAF, Iveco, MAN, Scania, Volvo, Delphi, Ford, GM, Google, Honda, Hyunadi, Intel, Iveco, Jaguar, LandRover, Lyft, Mercedes-Benz, Microsoft, Mobileye, Nissan, Renault, Nvidia, PSA, Tata Elxsi, Tesla, Toyota, Uber, Volkswagon, and Yutong. *Id.*

51. *See* Christoph Rauwald & Dorthee Tschampa, *Mercedes-Benz to Test Self-Driving Cars on California Roads*, BLOOMBERG TECH. (Sept. 18, 2014, 11:06 AM), https://www.bloomberg.com/news/articles/2014-09-18/mercedes-benz-to-test-self-driving-cars-on-california-roads.

52. *See Testing of Autonomous Vehicles*, CAL. DEP'T OF MOTOR VEHICLES, https://www.dmv.ca.gov/portal/dmv/detail/vr/autonomous/testing (last visited Nov. 12, 2016).

53. JP Mangalindan, *Google's New Self-Driving Cars Hit Streets of Mountain View*, MASHABLE (June 25, 2016), http://mashable.com/2015/06/25/google-self-driving-cars-mountain-view.

54. *See id.*

55. See *id.*

Google reported a total of fifty-eight vehicles on public roads in Washington, California, Arizona, and Texas.[56]

- Mercedes-Benz first tested its Mercedes-Benz S500 Intelligent Driver prototype in Germany in 2013.[57] The autonomous vehicle traveled sixty miles on the Autobahn.[58] The company has been testing driverless vehicles on public roads in California since September 2014.[59]
- In 2015, a team of engineers from Delphi Automotive drove from San Francisco to New York City (approximately 3,400 miles).[60] The trip, which took nine days, "was accomplished with '99 percent of the drive in fully automated mode,' . . . using an Audi Q5 SUV modified with all manner of cameras, radars, and laser scanners."[61] In addition to running test drives in California and Nevada, the company has also agreed to send a fleet of autonomous vehicles to Singapore to test that nation's "mobility-on-demand" program.[62]
- Cruise Automation, a startup acquired by General Motors in early 2016, has been testing its autonomous technology on the Chevrolet Bolt EV in San Francisco since May 2016.[63] In August 2016, Cruise Automation announced that it "has expanded testing of self-driving car technology to Scottsdale, Arizona."[64]
- A team of journalists drove an Audi A7 on autopilot from Silicon Valley to Las Vegas, a distance of 550 miles.[65]
- "Bosch has been developing and testing automated functions and automated-driving features on BMW 3 Series vehicles in both California and Michigan" since at least 2013.[66]

---

56. *See Google Self-Driving Car Project Monthly Report*, GOOGLE (June 2016), https://static.googleusercontent.com/media/www.google.com/en//selfdrivingcar/files/reports/report-0716.pdf.

57. *See* Stephen Edelstein, *Germany Plans Autonomous Car Test Program on High-Speed Autobahn*, MOTOR AUTHORITY (Jan. 28, 2015), http://www.motorauthority.com/news/1096521_germany-plans-autonomous-car-test-program-on-high-speed-autobahn.

58. *See id.*

59. *See* Rauwald & Tschampa, *supra* note 51.

60. *See* Bill Howard, *Delphi Self-Driving Car Goes Coast-to-Coast, Autonomously*, EXTREME TECH (Apr. 13, 2015, 8:37 AM), http://www.extremetech.com/extreme/203216-delphi-self-driving-car-goes-coast-to-coast-autonomously.

61. *See id.*

62. *See* Tamara Warren, *Delphi Tests Self-Driving Car Service in Singapore,* THE VERGE (Aug. 1, 2016, 12:01 AM), http://www.theverge.com/2016/8/1/12337516/delphi-self-driving-car-service-singapore.

63. *See* Kristen Korosec, *GM's Cruise Automation Is Testing Self-Driving Chevy Bolts in Arizona*, FORTUNE (Aug. 9, 2016, 2:01 AM), http://fortune.com/2016/08/09/cruise-automation-arizona-gm. Although Arizona has not passed any legislation regarding autonomous vehicles, the state's Governor, Doug Ducey, "issued an executive order supporting the testing and operation of automated vehicles on public roads" in 2015. *Id.*

64. *See id.*

65. *See* Stefano Pozzebon, *Audi Drove This Auto-Pilot Luxury Car from San Francisco to Vegas*, BUS. INSIDER (Jan. 6, 2015, 7:36 AM), http://www.businessinsider.com/audi-a7-drives-auto-pilot-to-vegas-2015-1.

66. *See* Wayne Cunningham, *Bosch Self-Driving Car Spotted in California*, ROAD SHOW (July 19, 2013, 6:29 PM), https://www.cnet.com/roadshow/news/bosch-self-driving-car-spotted-in-california/; *see also* Shreyas Burra, *Evolution of Cars,* AUTOPILOT CAR (Mar. 29, 2016, 2:10 PM), http://autopilotcar.blogspot.com/.

- In September 2016, Uber began offering select customers in Pittsburgh[67] the opportunity to test its Uber Advanced Technologies Car, a hybrid Ford Fusion.[68] And in December, the company unleashed a "fleet of autonomous Volvos to riders"[69] in San Francisco.
- Tesla, BMW, Infiniti, and Mercedes currently each offer vehicles with self-driving features or capabilities designed to "relieve your brain of some driving tedium."[70]

B. No Self-Driving Vehicle at Fault

Despite all this activity, accidents have been low.[71] In October 2015, the University of Michigan Transportation Research Institute published a comparison of "the cumulative on-road safety record of self-driving vehicles for three of the ten companies that are currently approved for such vehicle testing in California (Google, Delphi, and Audi)"[72] against "the safety record of all conventional vehicles in the U.S. for 2013."[73] They found that self-driving vehicles have a higher accident rate per million miles traveled than conventional vehicles.[74] However, they also found that "self-driving vehicles were not at fault in *any* crashes they were involved in."[75]

C. Well, No Self-Driving Vehicle at Fault Until 2016

i. Google Collides with a Bus

Google's self-driving car *caused* its first accident on February 14, 2016.[76] As Google reported to the California Department of Motor Vehicles:

67. *See* Signe Brewster, *Uber Starts Self-Driving Car Pickups in Pittsburgh,* TECHCRUNCH (Sept. 14, 2016), https://techcrunch.com/2016/09/14/1386711/

68. *See* Molly, *Steel City's New Wheels*, UBER (May 19, 2016), https://newsroom.uber.com/us-pennsylvania/new-wheels/.

69. *See* Alex Davies, *Uber Refuses to Stop Self-Driving in SF, Setting up a Legal Showdown,* WIRED (Dec. 16, 2016) https://www.wired.com/2016/12/uber-refuses-stop-self-driving-sf-setting-legal-showdown/. A week later, Uber's San Francisco experiment came to an end when the California Department of Motor Vehicles revoked the registration of the fleet of 16 self-driving cars. *See* Alan Ohnsman, *Uber Halts San Francisco Driverless Cars as DMV Revokes Test Fleet Registration,* FORBES (Dec. 21, 2016) http://www.forbes.com/sites/alanohnsman/2016/12/21/ubers-san-francisco-driverless-car-tests-end-as-dmv-revokes-vehicle-registrations.

70. *See* Don Sherman, *Semi-Autonomous Cars Compared! Tesla Model S vs. BMW 750i, Infiniti Q50S, and Mercedes-Benz S65 AMG*, CAR AND DRIVER (Feb. 2016), http://www.caranddriver.com/features/semi-autonomous-cars-compared-tesla-vs-bmw-mercedes-and-infiniti-feature-2015-infiniti-q50s-page-2.

71. *See* Brandon Schoettle & Michael Sivak, *A Preliminary Analysis of Real-World Crashes Involving Self-Driving Vehicles*, UNIV. OF MICH. TRANSP. RESEARCH INST., Rep. No. UMTRI-2015-34, at i (Oct. 2015), http://www.umich.edu/~umtriswt/PDF/UMTRI-2015-34.pdf.

72. *See id.*

73. *See id.*

74. *See id.*

75. *Id.* (emphasis added).

76. *See Google Self-Driving Car Project Monthly Report*, GOOGLE (Feb. 2016), https://static.googleusercontent.com/media/www.google.com/en//selfdrivingcar/files/reports/report-0216.pdf.

> A Google Lexus-model autonomous vehicle ("Google AV") was traveling in autonomous mode eastbound on El Camino Real in Mountain View in the far right-hand lane approaching the Castro St. intersection. As the Google AV approached the intersection, it signaled its intent to make a right turn on red onto Castro St. The Google AV then moved to the right-hand side of the lane to pass traffic in the same lane that was stopped at the intersection and proceeding straight. However, the Google AV had to come to a stop and go around sandbags positioned around a storm drain that were blocking its path. When the light turned green, traffic in the lane continued past the Google AV. After a few cars had passed, the Google AV began to proceed back into the center of the lane to pass the sand bags. A public transit bus was approaching from behind. The Google AV test driver saw the bus approaching in the left side mirror but believed the bus would stop or slow to allow the Google AV to continue. Approximately three seconds later, as the Google AV was reentering the center of the lane it made contact with the side of the bus. The Google AV was operating in autonomous mode and traveling at less than 2 mph, and the bus was travelling at about 15 mph at the time of contact. The Google AV sustained body damage to the left front fender, the left front wheel and one of its driver's-side sensors. There were no injuries reported at the scene.[77]

There is no indication as to whether the bus also sustained damage.[78] As no injuries were reported,[79] it is assumed that the municipality that owned the bus and Google reached a private agreement to cover any property damage.

ii. Uber Mishaps

Uber's self-driving vehicles have not caused any accidents as of this writing. However, they have reportedly made errors—of the type usually attributed to distracted or confused human drivers—which could have caused accidents. For example, in September 2016, Nathan Stachelek, an Uber driver himself, saw a self-driving car in Pittsburgh turn onto a "one-way road, going in the wrong direction."[80] Similarly, Christopher Koff, watched as an Uber Volvo in San Francisco "accelerated into an intersection while the light was still red . . . ."[81]

77. *Id.*
78. *See generally id.* (discussing only the damage sustained to the Google AV).
79. *See id.*
80. Alison Griswold, *Uber's Self-Driving Cars Are Already Getting into Scrapes on the Streets of Pittsburgh,* QUARTZ (Oct. 4, 2016) https://qz.com/798092/a-self-driving-uber-car-went-the-wrong-way-on-a-one-way-street-in-pittsburgh/.
81. Sam T. Levin, *Witness Says Self-Driving Uber Ran Red Light on Its Own, Disputing Uber's Claims,* THE GUARDIAN (Dec. 21, 2016) https://www.theguardian.com/technology/2016/dec/21/witness-says-self-driving-uber-ran-red-light-on-its-own-disputing-ubers-claims.

iii. The First Fatality

Tragically, a Tesla owner became the first "self-driving" fatality in May 2016.[82] As reported by the National Transportation and Safety Bureau :[83]

> About 4:40 p.m. eastern daylight time on Saturday, May 7, 2016, a 2015 Tesla Model S, traveling eastbound on US Highway 27A (US-27A), west of Williston, Florida, struck and passed beneath a 2014 Freightliner Cascadia truck-tractor in combination with a 53-foot semitrailer. At the time of the collision, the combination vehicle was making a left turn from westbound US-27A across the two eastbound travel lanes onto NE 140th Court, a local paved road. As a result of the initial impact, the battery disengaged from the electric motors powering the car. After exiting from underneath the semitrailer, the car coasted at a shallow angle off the right side of the roadway, traveled approximately 297 feet, and then collided with a utility pole. The car broke the pole and traveled an additional 50 feet, during which it rotated counterclockwise and came to rest perpendicular to the highway in the front yard of a private residence. The 40-year-old male driver and sole occupant of the Tesla died as a result of the crash.
>
> US-27A is a four-lane highway with a posted speed limit of 65 mph. A 75-foot-wide median separates the two eastbound lanes from the two westbound lanes. Additionally, at the uncontrolled intersection with NE 140th Court, both eastbound and westbound lanes incorporate left turn lanes, allowing for a median opening of about 132 feet. At the time of the crash, it was daylight with clear and dry weather conditions. . . .
>
> The combination vehicle—operated by Okemah Express, LLC—was transporting blueberries to a local produce farm. The Tesla struck the right side of the semitrailer, approximately 23 feet forward from the end of the trailer. Damage from the collision was consistent with a 90 degree angle of impact. Only minor damage above the height of the car was found on the semitrailer side panels, and the undercarriage of the trailer also showed only minor collision damage. . . .

82. There have also been reports of a Tesla-related death near Handan, China. Twenty-three-year-old Gao Yaning was killed when his Tesla Model S crashed into a road sweeping truck on January 20, 2016. However, there has been no official or public confirmation that the car was operating under Autopilot at the time. *See* Neal E. Boudette, *Autopilot Cited in Death of Chinese Tesla Driver,* N.Y. TIMES (Sept. 14, 2016), https://www.nytimes.com/2016/09/15/business/fatal-tesla-crash-in-china-involved-autopilot-government-tv-says.html.

83. *See Preliminary Report Highway HWY16FH018*, NAT'L TRANSP. SAFETY BD. (2016), http://www.ntsb.gov/investigations/AccidentReports/Reports/HWY16FH018-Preliminary-Report.pdf.

> Tesla system performance data downloaded from the car indicated that vehicle speed just prior to impact was 74 mph. System performance data also revealed that the driver was operating the car using the advanced driver assistance features Traffic-Aware Cruise Control and Autosteer lane keeping assistance. The car was also equipped with automatic emergency braking that is designed to automatically apply the brakes to reduce the severity of or assist in avoiding frontal collisions.[84]

It has been confirmed that a portable DVD player was found in the vehicle, but "it is not known for sure whether [the victim Joshua] Brown was watching a film at the time of the crash."[85]

To be clear, Tesla warns purchasers that "Autosteer is a hands-on feature" and that drivers "must keep [their] hands on the steering wheel at all times."[86] And reportedly, if the vehicle senses difficulty, as when entering a curve or high lateral acceleration, it will sound a chime and display an admonition on the instrument panel to "Hold Steering Wheel." [87] If no action is taken, the chime will sound again, and eventually, the vehicle "gradually reduces speed, stops and turns on the emergency lights."[88]

Tesla itself publicly made the following observation about the accident:

> What we know is that the vehicle was on a divided highway with Autopilot engaged when a tractor trailer drove across the highway perpendicular to the Model S. Neither Autopilot nor the driver noticed the white side of the tractor trailer against a brightly lit sky, so the brake was not applied. The high ride height of the trailer combined with its positioning across the road and the extremely rare circumstances of the impact caused the Model S to pass under the trailer, with the bottom of the trailer impacting the windshield of the Model S. Had the Model S impacted the front or rear of the trailer, even at high speed, its advanced crash safety system would likely have prevented serious injury as it has in numerous other similar incidents.[89]

Tesla also hinted at its possible defense strategy, in the event it is sued by the family of Mr. Brown, by taking the opportunity to remind the public that Autopilot

84. *Id.*

85. *See* Nicky Woolf, *Tesla Fatal Autopilot Crash: Family May Have Grounds to Sue, Legal Experts Say*, THE GUARDIAN (July 6, 2016, 7:00 AM), https://www.theguardian.com/technology/2016/jul/06/tesla-autopilot-crash-joshua-brown-family-potential-lawsuit.

86. *See* Electric Jen, *Ignoring Tesla Autopilot Warnings—What Happens?*, TESLARATI (Nov. 5, 2016), http://www.teslarati.com/what-happens-ignore-tesla-autopilot-warnings/.

87. *See id.*

88. *See* Fred Lambert, *Tesla Says that Driver Didn't Use Autopilot Properly in Model X Accident in Montana*, ELECTREK (July 12, 2016), https://electrek.co/2016/07/12/tesla-model-x-autopilot-accident-montana-tesla-statement/.

89. The Tesla Team, *supra* note 16.

"is an assist feature that requires you to keep your hands on the steering wheel at all times," that "you need to maintain control and responsibility for your vehicle" while using it, and that "every time that Autopilot is engaged, the car reminds the driver to '[a]lways keep your hands on the wheel. Be prepared to take over at any time.'"[90]

Joshua Brown's family has hired a personal injury lawyer, who has stated publicly that his firm has "been contacted by other drivers who have been involved in accidents while using Tesla's Autopilot feature."[91] As of this writing, no decision has been made by the family as to whether to pursue a claim against Tesla or not.[92]

iv. A Second, Third, Fourth, and Fifth Tesla Incident

While no further fatalities have been reported (as of this writing), four more Tesla accidents were made public during the last half of 2016.

- On July 1, Albert Scaglione "flipped his Model X onto its roof while driving on the Pennsylvania Turnpike about 100 miles east of Pittsburgh."[93] Scaglione's car was traveling east near mile marker 160, at "about 5 p.m., when it hit a guard rail 'off the right side of the roadway.[94] It then crossed over the eastbound lanes and hit the concrete median.'"[95] Scaglione has stated that he was using autopilot mode when the accident occurred.[96] Scaglione and his passenger sustained injuries.[97]
- On July 9, a driver in Montana, who identified himself only as "Pang," "crashed on a two-lane highway near Cardwell," Montana.[98] The driver has stated that autopilot on the car was engaged and the vehicle was traveling "between 55 and 60 mph when it veered to the right and hit a series of wooden stakes on the side of the road."[99] Neither the driver nor the passenger was injured, but the vehicle lost its front passenger side wheel and the driver was cited for careless driving.[100]

90. *See id.*
91. *See* Stephen Gandel, *Tesla Autopilot Crash Victim's Family Has Hired a Personal Injury Lawyer*, FORTUNE (July 11, 2016, 1:28 PM), http://fortune.com/2016/07/11/tesla-autopilot-joshua-brown/.
92. *See id.*
93. Chris Isidore & Gwen Sung, *Tesla Confirms "Autopilot" Crash in Montana*, KTVQ (July 12, 2016, 2:39 PM), http://www.ktvq.com/story/32427989/tesla-confirms-autopilot-crash-in-montana.
94. Greg Gardner, *Southfield Art Gallery Owner Survives Tesla Crash*, DETROIT FREE PRESS (July 6, 2016, 5:07 PM), http://www.freep.com/story/money/cars/2016/07/05/southfield-art-gallery-owner-survives-tesla-crash/86712884/.
95. *Id.*
96. *See id.*
97. *See id.*
98. Chris Isidore & Gwen Sung, *Driver in Tesla Autopilot Accident Would Buy Another Tesla*, CNN (July 12, 2016, 4:02 PM), http://money.cnn.com/2016/07/12/technology/tesla-autopilot-accident/.
99. *Id.*
100. *Id.*

- On August 2, another Tesla Model S caused an accident in Beijing, China.[101] The car, again with the autopilot engaged, collided with a car that was illegally parked on the left side of the road.[102] The operator of the vehicle, Luo Zhen, admits that his hands were not on the steering wheel and blames Tesla for "falsely advertising" that the vehicle is self-driving.[103] Mr. Luo has publicly criticized Tesla and noted that he has been contacted by a "lawyer team . . . to support him to sue Tesla for false advertising but he has not decided whether to do it yet."[104]
- On September 28, an unnamed "50-year-old driver from Brandenburg[, Germany] drove into the back of a Danish tour bus as it was returning to the inside lane after overtaking."[105] The driver and police confirmed that the Tesla Motors car was "operating under Autopilot" when the collision occurred in Ratzeburg, Germany.[106] The driver "was slightly injured but none of the 29 bus passengers were hurt."[107] Tesla has "denied that Autopilot was at fault, saying the bus swerved into the car's lane and side-swiped the Tesla."[108] The Tesla spokesperson went on to note, with perhaps a hint of frustration, that the automaker "can only do so much to prevent an accident."[109]

It is worth noting that along with sophisticated driving capabilities, like Autopilot, come sophisticated recording and reporting measures.[110] Thus, each Tesla vehicle records a data log that, among other things, will inform: whether or not the autopilot feature was engaged; whether or not the driver's hands were on the wheel at the time of the accident; and whether or not any warning systems (e.g., chimes, panel notifications) were triggered.[111] While intended to help the company continue improving its product, the data log has the added benefit of preventing people from lying about their accidents.[112]

101. Tyler Durden, *In First Autopilot Crash in China, Tesla Model S Driver Crashes in Beijing with Autopilot Engaged*, ZERO HEDGE (Aug. 8, 2016, 6:53 PM), http://www.zerohedge.com/news/2016-08-08/first-autopilot-crash-china-tesla-model-s-driver-crashes-beijing-autopilot-engaged.
102. *Id.*
103. *Id.*
104. *Id.*
105. Reuters, *Tesla Says Autopilot Not to Blame in Crash with Bus in Germany*, FORTUNE (Sept. 29, 2016), http://fortune.com/2016/09/29/tesla-autopilot-crash-germany/
106. *Id.*
107. *Id.*
108. *Id.*
109. *Id.*
110. *See* Tom Simonite, *Tesla Knows When a Crash Is Your Fault, and Other Carmakers Soon Will, Too*, MIT TECH. REV. (June 8, 2016), https://www.technologyreview.com/s/601657/tesla-knows-when-a-crash-is-your-fault-and-other-carmakers-soon-will-too/.
111. Lucy Bayly, *Tesla Sends Owner Detailed Log After Self-Parking Crunch*, NBC NEWS (May 16, 2016, 2:08 PM), www.nbcnews.com/tech/tech-news/it-s-your-fault-tesla-sends-owner-detailed-log-after-n572926.
112. *See* Justin T. Westbrook, *Stop Lying About Tesla's Autopilot Crashing Your Car*, JALOPNIK (June 6, 2016, 7:30 PM), http://jalopnik.com/stop-lying-about-teslas-autopilot-crashing-your-car-1780908237.

It also is worth noting that within this same time period, Tesla's Autopilot feature has been credited with saving a life.[113] Joshua Neally, a lawyer from Missouri, says that his Tesla

> drove him 20 miles down a freeway to a hospital, while Neally suffered a potentially fatal blood vessel blockage in his lung, known as a pulmonary embolism. The hospital was right off the freeway exit, and Neally was able to steer the car the last few meters and check himself into the emergency room.[114]

And finally, in December the U.S. National Highway Traffic Safety Administration completed a review of Tesla's Autopilot System prompted by the fatal car accident of May 2016. The Administration found "no specific flaw in the technology and [is] taking no action against the carmaker."[115] In fact, quite to the contrary, the report found "that crash rates involving Tesla cars have dropped by almost 40% since the wide introduction of Autopilot."[116]

IV. THE DESIGNATED DUTY PASSENGER

A. Should the Computer Be Liable?

Joshua Brown, Albert Scaglione, "Pang," and Luo Zhen were each identified as the "driver" of the vehicle they occupied when that vehicle collided with another vehicle or object, or in the case of Mr. Scaglione, when the vehicle flipped.[117] Who is liable for the resulting damage, injury, and loss of life?

Commentators are generally in agreement that current product liability laws adequately cover instances where loss is due to a manufacturing or design defect;[118] but what if we assume—and this is, admittedly a very large and blanket assumption—that there is no manufacturing or design defect? Who is liable? Many

113. Robert Ferris, *Man Says Tesla Autopilot Saved His Life by Driving Him to Hospital*, CNBC (Aug. 5, 2016, 3:15 PM), http://www.cnbc.com/2016/08/05/man-says-tesla-autopilot-saved-his-life-by-driving-him-to-the-hospital.html.

114. *Id.*

115. Alan Ohnsman, *US Investigation of Deadly Tesla Autopilot Crash Finds No Defect,* FORBES (Jan. 19, 2017, 1:26 PM), http://www.forbes.com/sites/alanohnsman/2017/01/19/u-s-regulators-end-review-of-tesla-autopilot-driving-system-finding-no-defect.

116. Darrell Etherington, *NHTSA's Full Final Investigation into Tesla's Autopilot Shows 40% Crash Rate Reduction,* TECHCRUNCH (Jan. 19, 2017,) https://techcrunch.com/2017/01/19/nhtsas-full-final-investigation-into-teslas-autopilot-shows-40-crash-rate-reduction/.

117. Some analysts have suggested that Tesla may be liable for false advertising based on the use of language on its Chinese marketing material. "Tesla's Chinese website uses the phrase '*zidong jiashi*,' which is literally translated as 'autopilot' but can also mean 'self-driving,' a phrase analysts say is ambiguous." Tesla added fuel to this smoldering issue by changing the language on its website in the middle of August 2016 and subsequently changing it back "after the change had been noticed and widely reported online." Peter Campbell, *Tesla Shifts into Reverse on Dropping Autopilot Label in China*, FIN. TIMES (Aug. 15, 2016), http://www.ft.com/cms/s/0/3e9f58aa-62d4-11e6-a08a-c7ac04ef00aa.html#axzz4HQFnq3j6. The author does not take a position on this or any potential false advertising claim.

118. *See* Kyle Colonna, *Autonomous Cars and Tort Liability*, 4 CASE W. RES. J.L. TECH. & INTERNET 81, 108–09 (2012).

have offered differing theories about what standard of duty the occupant of a self-driving vehicle adopts when a car is operating in self-driving mode, from strict liability of the driver, to strict liability on the part of the manufacturer.[119] I suggest something far more flexible.

B. What Is Self-Driving?

The first step in determining the appropriate assignation of liability is understanding the differing levels of autonomy that have come to be encompassed by the term "self-driving." In 2013, the National Highway Transportation and Safety Administration developed Policy Automation Levels:

- Level 1, or Function-Specific Automation, involves one or more specific control functions including, for example, "pre-charged brakes where the vehicle automatically assists with braking to enable the driver to regain control of the vehicle or stop faster than possible by acting alone."[120]
- Level 2, or Combined Function Automation, involves "automation of at least two primary control functions designed to work in unison to relieve the driver of control of those functions.[121] An example of combined functions enabling a Level 2 system is adaptive cruise control in combination with lane centering."[122]
- Level 3, or Limited Self-Driving Automation, describes vehicles that

> enable the driver to cede full control of all safety-critical functions under certain traffic or environmental conditions and in those conditions to rely heavily on the vehicle to monitor for changes in those conditions requiring transition back to driver control.[123] *The driver is expected to be available for occasional control, but with sufficiently comfortable transition time.*[124]

- Level 4, or Full Self-Driving Automation, describes vehicles

119. *See, e.g.*, Sophia H. Duffy & Jamie Patrick Hopkins, *Sit, Stay, Drive: The Future of Autonomous Car Liability*, 16 SMU SCI. & TECH. L. REV. 453, 453 (2013) ("The laws governing canine ownership show that applying strict liability to autonomous car owners accomplishes the dual purpose of fairly assessing liability without hampering the widespread adoption of this marvelous technology."); Jeffrey K. Gurney, *Sue My Car Not Me: Products Liability and Accidents Involving Autonomous Vehicles*, 2013 U. ILL. J.L. TECH. & POL'Y 247, 247 (2013) ("[T]he autonomous technology manufacturer should be liable for accidents caused in autonomous mode because the autonomous vehicle probably caused the accident."); Jeffrey R. Zohn, *When Robots Attack: How Should the Law Handle Self-Driving Cars that Cause Damages*, 2015 U. ILL. J.L. TECH. & POL'Y 461, 464 (2015) (stating that states should choose "if they want to adopt a policy similar to autopilot in airplanes and ships or a policy similar to elevator liability"); Colonna, *supra* note 110, at 86, 104–07, 109 (proposing "a new insurance framework that works in conjunction with current tort law in order to govern the liability of autonomous car manufacturers").

120. Press Release, Nat'l Highway Traffic Safety Admin., U.S. Dep't of Transp. Releases Policy on Automated Vehicle Dev. (May 30, 2013), http://www.nhtsa.gov/About+NHTSA/Press+Releases/U.S.+Department+of+Transportation+Releases+Policy+on+Automated+Vehicle+Development.

121. *Id.*

122. *Id.*

123. *Id.*

124. *Id.* (emphasis added).

> designed to perform all safety-critical driving functions and monitor roadway conditions for an entire trip.[125] Such a design anticipates that the driver will provide destination or navigation input, but is not expected to be available for control at any time during the trip. This includes both occupied and unoccupied vehicles.[126]

This article concerns itself solely with the treatment of so-called Level 3 and Level 4 vehicles. While one can foresee a time that operators of Level 4 cars may earn a unique liability regime, this author recommends treating Level 3 and Level 4 vehicles similarly for two primary reasons: first, although even the most optimistic forecasts do not expect fully autonomous, Level 4 vehicles to be generally available before 2020,[127] state legislatures, already playing catch-up in this field, would be wise to address Level 4 autonomy with the strictest guidelines before, and not after, it becomes widespread; and second, as consumers adjust to the notion of autonomous vehicles, it is necessary to remind them, certainly in the short term, that a vehicle, whether autonomous or not, can be dangerous when not operated responsibly. Indeed, arguably, for purposes of liability assignation, a distinction should be clearly made in Level 4 vehicles between "hybrid" autonomy, which allows human control at certain times, and full autonomy, which permits no human control, and indeed, lacks a steering wheel or foot pedals.

In addressing liability, certain policy considerations must be taken into account and balanced:

- Self-driving cars offer many societal benefits. We like and want Level 3 and nascent Level 4 cars on the road because they will provide the data and information needed to create the algorithms that will assure the safety of truly autonomous fleets of vehicles.[128]
- Safety of vehicle passengers and third parties remains a paramount policy concern, and manufacturers should not be permitted to avoid liability.
- The ability to drive a vehicle is a privilege, which requires a license. Operating a vehicle in self-driving mode should not absolve the operator of liability as such operators must bear the responsibility of understanding what their autonomous vehicles are and are not capable of.

Liability should strike a balance that will allow for the continued safe development of autonomous technology while assuring the safety of individuals in and out of the vehicle. Thus, state laws should recognize when a vehicle operator is relying on self-driving capabilities and becomes the vehicle's passenger, while not absolving those operators of their own responsibilities. When a driver switches to self-driving mode, the driver should become a Designated Duty Passenger: one that

125. *Id.*
126. *See* Press Release, Nat'l Highway Traffic Safety Admin., *supra* note 120.
127. *Autonomous Car Forecasts*, DRIVERLESS CAR MARKET WATCH, http://www.driverless-future.com/?page_id=384 (last visited Nov. 14, 2016).
128. *See Top Misconceptions of Autonomous Cars*, DRIVERLESS CAR MARKET WATCH, http://www.driverless-future.com/?page_id=774 (last visited Nov. 14, 2016).

has a continued, heightened duty to assist the driver at all times. In a Level 3 vehicle, the person behind the wheel is best situated to be this Designated Duty Passenger. In Level 4 vehicles, such a passenger can be designated by the occupants based on seating or voluntary election.

C. Florida Common Law

The idea of a passenger with a heightened duty has roots in Florida law.[129]

> Florida, like other jurisdictions, recognizes that a legal duty will arise whenever a human endeavor creates a generalized and foreseeable risk of harming others. . . . [In other words,] [w]here a defendant's conduct creates a *foreseeable zone of risk,* the law generally will recognize a duty placed upon defendant either to lessen the risk or see that sufficient precautions are taken to protect others from the harm that risk poses.[130]

The Florida Supreme Court has stated that "each defendant who creates a risk is required to exercise prudent foresight whenever others may be injured as a result."[131] Thus, it is logical to recognize that a person who purchases a vehicle for the purpose of being transported on public roads, which are populated by other vehicles and pedestrians, has created a zone of risk around that vehicle—even when the vehicle is in autonomous mode, and the driver is arguably a passenger.

Indeed, a Florida court has applied this doctrine to the passenger of a vehicle being operated by another individual.[132] In *Roos v. Morrison*,[133] the issue was

> whether a vehicular passenger may be held liable to another vehicular passenger in circumstances where the potentially liable passenger was in a superior position to the driver of that passenger's vehicle to observe a potential hazard and gave affirmative advice to the driver which resulted in a collision with the other passenger's vehicle.[134]

The court recognized that ordinarily, "a passenger or guest riding in an automobile is generally entitled to 'trust the vigilance and skill' of the driver."[135] However, the court also noted that "certain circumstances can give rise to a duty on

---

129. McCain v. Fla. Power Corp., 593 So. 2d 500, 503 (Fla. 1992) (citing Kaisner v. Kolb, 543 So. 2d 732, 735 (Fla. 1989)).
130. *Id.*
131. *Id.*
132. Roos v. Morrison, 913 So. 2d 59, 64 (Fla. Dist. Ct. App. 2005).
133. *Id.* at 59.
134. *Id.* at 62.
135. *Id.* at 64. (first citing Knudsen v. Hanlan, 36 So. 2d 192, 194 (Fla. 1948); then citing Fla. E. Coast Ry. Co. v. Keilen, 183 So. 2d 547, 549 (Fla. Dist. Ct. App. 1966); and then citing Bessett v. Hackett, 66 So. 2d 694, 698 (Fla. 1953)).

the part of a mere passenger to make reasonable attempts 'through suggestion, warning, protest or other means suitable to the occasion, to control the conduct of the driver.'"[136]

The court found that in order for the exception of this general rule to apply, the passenger must "know[], or by the exercise of ordinary and reasonable care should know from the circumstances of the occasion, that the driver is not exercising that degree of care in the operation of the vehicle compatible with the safety of his passenger."[137]

The facts of *Roos* are instructive. The plaintiff, Roos, was a passenger on a motorcycle.[138] The motorcycle stopped a safe distance from the SUV in which the defendant, Morrison, was riding as a passenger.[139] The driver of the SUV "was stopped because of traffic."[140] After waiting for the traffic to clear, the driver either asked Morrison if there was space behind the SUV for him to back it up or Morrison gratuitously turned around in his seat to see if the road in back was clear.[141] It is agreed that Morrison was in a superior position to see.[142] Relying on Morrison's "all clear," the driver backed up and struck the motorcycle, causing injuries to the plaintiff.[143]

The court found that if Morrison had exercised reasonable care, he would have seen the motorcycle on which the plaintiff was riding.[144] Being in the backseat put Morrison at a "superior" vantage point, and by turning around Morrison assumed a duty.[145] In ruling against Morrison, the Florida court relied upon a Louisiana case with a similar fact pattern.[146]

> [F]ifteen-year-old Jeremy Byrne was operating a single-seat, enclosed-cab tractor (with plow in tow) while his friend, Chris Edwards, fourteen, sat on the lefthand armrest. As the tractor traveled along a wet, unpaved road, its tires began spewing mud and dirt, eventually obstructing the views from both side windows. When the teenagers reached the stop sign at an intersection with a state highway, Jeremy asked Chris to check for traffic. Chris opened the door and stepped out of the cab onto the tractor's diesel tank to get a better view of the road. He signaled to Jeremy, but what that signal meant and Jeremy's understanding of it are in

136. *Roos*, 913 So. 2d at 64.
137. *Id.*
138. *Id.* at 62.
139. *Id.*
140. *Id.*
141. *Id.*
142. *Roos*, 913 So. 2d at 62.
143. *See id.*
144. *Id.*
145. *Id.* at 63.
146. *Id.* at 66.

> dispute. The result is that Jeremy entered the intersection before it was safe to do so and collided with the Jagneauxs' van.[147]

The plaintiffs, the Jagneauxs, sued the parents of both teenagers.[148] The trial court dismissed the claim against Chris Edwards (the passenger), but the appellate court overruled the dismissal, finding that the passenger "Chris was acting beyond the role of a guest passenger when he assumed the duty of checking for traffic."[149]

Technically, Joshua Brown, Albert Scaglione, "Pang," and Luo Zhen were passengers while their vehicles were in self-driving mode. With the exception of Mr. Scaglione, in each case Tesla has indicated that none of these individuals had their hands on the wheel of their vehicles despite warnings to do so, which may or may not have included chimes and messages on the instrument panel.[150] In addition:

- Mr. Brown may have been watching a DVD.[151]
- Mr. Scaglione was traveling in an area that "[a]nyone who has driven on the Pennsylvania Turnpike knows that its narrow shoulders and concrete medians leave little margin for driver error."[152]
- "Pang" was driving on "a winding road going through a canyon, with no shoulder."[153]
- Lou Zhen admitted he was not paying attention.[154]

If lawsuits arise from these incidents, more information will certainly become available, but based on the way the Autopilot warning system is intended to work, each of these individuals was warned—or asked by the "driver"—to check on the situation.[155] Like Mr. Morrison and young Chris Edwards, they were called upon to help the driver.[156] And like Mr. Morrison and young Chris Edwards, they failed, or may have failed, to exercise a reasonable degree of care.[157]

As a matter of law, the individual who initially has control of a self-driving car and then puts it into autopilot must assume that the driver, the car itself, "is not

147. Jagneaux v. La. Farm Bureau Cas. Ins. Co., 771 So. 2d 109, 110 (La. Ct. App. 2000).
148. *Id.*
149. *Id.* at 112.
150. *See* Joan Lowy & John Krisher, *Tesla Driver Watched 'Harry Potter' Movie as He Crashed, Witness Says*, DETROIT FREE PRESS (July 1, 2016, 6:00 PM), http://www.freep.com/story/money/cars/2016/07/01/tesla-driver-harry-potter-crash/86596856/; *see also* Isidore & Sung, *supra* note 98; Christian Sheperd et al., *Tesla Crash in China Raises Concerns on Autopilot Claims*, FIN. TIMES (Aug. 10, 2016), https://www.ft.com/content/fea48460-5ee5-11e6-a72a-bd4bf1198c63.
151. *See* Lowy & Krisher, *supra* note 150.
152. *See* Gardner, *supra* note 94.
153. *See* Isidore & Sung, *supra* note 98.
154. Sheperd et al., *supra* note 150.
155. *See* Lowy & Krisher, *supra* note 150; Gardner, *supra* note 94; Isidore & Sung, *supra* note 98; Sheperd et al., *supra* note 150.
156. *See* Roos v. Morrison, 913 So. 2d 59, 62–63 (Fla. Dist. Ct. App. 2005); Jagneaux v. La. Farm Bureau Cas. Ins. Co., 771 So. 2d 109, 110 (La. Ct. App. 2000); Lowy & Krisher, *supra* note 150; Gardner, *supra* note 93; Isidore & Sung, *supra* note 98; Sheperd et al., *supra* note 150.
157. *See Roos*, 913 So. 2d at 62–63; *Jagneaux*, 771 So. 2d at 110; Lowy & Krisher, *supra* note 150; Gardner, *supra* note 94; Isidore & Sung, *supra* note 98; Sheperd et al., *supra* note 150.

exercising that degree of care . . . compatible with the safety of [its] passenger" or those around them—especially, but not only, if a warning has been triggered.[158]

The Designated Duty Passenger duty is more difficult to rationalize in the case of a Level 4 vehicle. The very purpose of a fully-autonomous car is to permit its passengers to stop paying attention so that they may rest or work while being transported.[159] Similarly, these vehicles are ideal forms of transport for people with disabilities, who may not be in a position to assume control due to physical constraints. At this point, this question is moot as this technology has not yet developed to the point of public consumption and test vehicles are required to be manned.[160] Ultimately, with responsible and controlled testing of autonomous systems in Level 3 vehicles,[161] the plethora of companies racing to bring full autonomy to market,[162] and the development of comprehensive federal safety regulations,[163] one can see a future where the human inside the driverless car does not need to become a Designated Duty Passenger. However, until this trifecta of conditions is met, it is wiser to lump Level 4 vehicles in with Level 3 to focus any litigation on safety and responsibility, rather than the categorization of any given vehicle. Thus, state legislatures must address vehicles that may have only a self-driving mode and require a passenger of such vehicles to become the Designated Duty Passenger, tasked with the duty to keep an eye on the road and the driver.

V. CODIFYING THE DESIGNATED DUTY PASSENGER RULE

An excellent survey of laws enacted in California, Michigan, Florida, Nevada, and Washington, D.C., including recommendations for a uniform law, was prepared by the University of Washington School of Law Technology Law and Policy Clinic by its Autonomous Vehicle Team (the "UW Team").[164] Current laws

158. *Roos*, 913 So. 2d at 64.

159. *See Driverless Car*, WHATIS.COM, http://whatis.techtarget.com/definition/driverless-car (last visited Nov. 14, 2016); Dan McLaughlin, *17 Ways Driverless Cars Could Change America*, FEDERALIST (July 16, 2014), http://thefederalist.com/2014/07/16/17-ways-driverless-cars-could-change-america/.

160. *See Summary of Draft Autonomous Vehicles Deployment Regulations*, CAL. DEPT. OF MOTOR VEHICLES (Dec. 16, 2015), https://www.dmv.ca.gov/portal/wcm/connect/dbcf0f21-4085-47a1-889f-3b8a64eaa1ff/AVRegulationsSummary.pdf?MOD=AJPERES.

161. *See, e.g.*, Andrew R. Swanson, Comment, *Somebody Grab the Wheel!: State Autonomous Vehicle Legislation and the Road to a National Regime*, 97 MARQ. L. REV. 1085, 1091–92 (2014) (The implementation of autonomous vehicles should occur in two steps. First, states should continue enacting legislation for the testing of autonomous vehicles. Second, state motor vehicle departments should then enact regulations necessary to ensure that requirements for the testing of autonomous vehicles are met, and to ensure public safety during those tests.).

162. *See, e.g.*, Neal E. Boudette, *Ford Promises Fleets of Driverless Cars Within Five Years*, N.Y. TIMES (Aug. 16, 2016), http://www.nytimes.com/2016/08/17/business/ford-promises-fleets-of-driverless-cars-within-five-years.html. Ford Motor Company, referencing the race to develop driverless cars with other automakers, announced that it "planned to mass produce driverless cars and have them in commercial operation in a ride-hailing service by 2021." *Id.* Ford promised that these cars "would be radically different from those that populate American roads now," with no steering wheels, gas pedals, or brake pedals. *Id.*

163. *See, e.g.*, Swanson, *supra* note 161, at 1092 (discussing the second step of a two-step process for the implementation of autonomous vehicles as the National Highway Traffic Safety Administration developing federal regulations to ensure manufacturers will continue to develop these autonomous vehicle technologies).

164. *See* UNIV. OF WASH. TECH. LAW & POLICY CLINIC FOR UNIF. LAW COMM'N, AUTONOMOUS VEHICLE LAW REPORT AND RECOMMENDATIONS TO THE ULC 1,

generally cover the testing of autonomous vehicles;[165] nevertheless, basic language is helpful. Using this study as a backbone, the following guidelines are recommended in order to codify a Designated Duty Passenger duty into law. To be clear, there are many concerns and issues to address with respect to autonomous vehicle technology. The list below covers only those provisions that would be needed to assure the codification of a Designated Duty Passenger liability standard.

A. Autonomous Vehicle

As recommended by the UW Team, "autonomous vehicle" should be defined as "a motor vehicle equipped with autonomous technology that can drive the vehicle without the active physical control or monitoring of a human for any duration of time."[166] This language adequately covers all Levels of vehicles.

B. Definition of Driver

The term "driver" must be defined in such a way as to include passengers, or at least one passenger, in a fully automated Level 4 vehicle. It may be that this can be accomplished simply by confirming that only licensed drivers[167] are permitted to operate autonomous vehicles or put vehicles in autonomous mode.

C. Duty of the Driver/Designated Duty Passenger

The UW Team recommends that while drivers "need not actively monitor an autonomous vehicle and the roadway while the vehicle is in autonomous mode . . . [they must] passively monitor the roadway and vehicle at all times."[168] However, the very term "passive"[169] invites inertia.

---

https://www.law.washington.edu/Clinics/Technology/Reports/AutonomousVehicle.pdf (last visited Nov. 14, 2016) [hereinafter UNIV. OF WASH.].

165. *See id.* at 3–11.

166. *Id.* at 2.

167. *See infra* Part V.D.

168. UNIV. OF WASH., *supra* note 164, at 16.

169. *Id.* According to the UW Team, "passive monitoring" requires, at a minimum, that the driver:

- Faces the roadway in an upright position[.]
- Remains awake, alert, and unimpaired[.]
- Maintains at least peripheral eye-contact with the road in front during forward driving. - This means the driver can view cars and objects before them even if not focused on them].
- Maintains an unobstructed field of view out from the vehicle to the road in front and sides as well as behind the vehicle with the aid of side and rearview mirrors. [This means the driver cannot place a newspaper in front of the individual so that they cannot see the roadway or a TV screen up on top of the dashboard].
- Maintains an unobstructed area around the steering wheel as well as gas and brake pedals to allow for immediate driver intervention.
- Occasionally checks that the autonomous vehicle is operating correctly and has not encountered a situation it is incapable of handling.
- Actively intervenes whenever the safety of other drivers or efficient use of the roadways requires.

Instead, the law must simply require that the driver of an autonomous vehicle remain actively and physically prepared to intervene and disengage the vehicle from autonomous mode whenever roadway safety or any other circumstances so require.[170]

D. Automated Vehicle License

Individuals must be licensed to drive autonomous vehicles.[171] As noted by the UW Team, an entirely new licensing regime would be both costly and administratively burdensome.[172] As such, it recommends requiring that licensed drivers simply be "endorsed" to operate an autonomous vehicle on public roads.[173] The following language, almost wholly borrowed from the UW Team, is recommended; however, revised or suggested language is in italics:[174]

> (a) Drivers of autonomous vehicles must obtain a state endorsement on their driver's licenses in order to demonstrate that they can safely and lawfully operate an autonomous vehicle on public highways. The DMV shall establish detailed requirements for a driver to obtain an endorsement. In order to obtain an endorsement, drivers must:
>
> i. Certify with the DMV that they have received and understand manufacturer-provided instructions.
>
> ii. Certify with the DMV that they acknowledge and understand the legal responsibility of operating an autonomous vehicle while it is engaged in autonomous mode.
>
> iii. Certify that they will intervene and physically reassume control of an autonomous vehicle in the event that public safety or the efficient use of the roadways so requires.
>
> iv. Certify that before re-selling an autonomous vehicle, the holder of the endorsement will obtain a certificate of compliance from a licensed certification agency; and

---

Id. This language is better-suited as illustrative descriptors in the proposed Department of Motor Vehicle endorsement process described in the following text.

170. UNIV. OF WASH., *supra* note 164, at 16.

171. *See id.* at 18–19.

172. *Id.* at 19.

173. *See id.*

174. *Id.* Omitted from the UW Team's language is the concept of "monitoring" the vehicle while in self-driving mode as the term "monitor" does not adequately convey the active duty of the Designated Duty Passenger to be aware at all times.

> (b) Manufacturers must provide with the sale of an autonomous vehicle instructions on the safe and lawful operation of the vehicle.[175]

It must also be made clear that this language covers even Level 4 completely autonomous cars.

E. License Plates

Autonomous vehicles should be issued a special license plate. The UW Team recommends such license plates be green and encompass "lighting arrays" that automatically turn on when a vehicle is in autonomous mode.[176] There are important reasons for requiring this distinction. It alerts bystanders, including police, as to the nature of the vehicle. However, it must be clear that alerting the public as to the possible autonomous nature of the vehicle will not absolve the Designated Duty Passenger of liability.

F. Crash Data Records

Each state must also require that autonomous vehicles be equipped with crash data recorders[177] as they are critical in the development of the safest autonomous vehicles possible. The information about how a system did or did not work will be invaluable for research. However, again, it must be clear that the lack of a warning will not absolve the Designated Duty Passenger of liability. Failure of a warning system should not be enough to release the Designated Duty Passenger from the independent duty to remain alert.

G. Required Functionalities

As recommended by the UW Team, all autonomous vehicles must be equipped with the following features:

- An accessible means to immediately engage or disengage the autonomous technology, such as a button, knob, or lever.[178]
- A means to immediately disengage the autonomous technology when a human driver reasserts control by turning the steering wheel or depressing the gas or brake pedal.[179]
- A prominent and immediate visual indicator that the autonomous technology has been activated or deactivated and a continuing indication that the

175. *Id.*
176. UNIV. OF WASH., *supra* note 164, at 11.
177. *See id.* at 12.
178. *Id.* at 17.
179. *Id.* at 17.

technology remains active or inactive.[180] The indicator must be viewable by any visually-enabled individual in the driver's seat.[181]

- An immediate auditory indicator that the autonomous technology has been activated or deactivated.[182]
- Both visual and auditory alerts if the autonomous technology malfunctions.[183]

In addition to these solid suggestions, car manufacturers must be required to slow the car down automatically if the autonomous technology malfunctions.

VI. CONCLUSION

While this author cannot opine on the quality of Volvo's IntelliSafe Autopilot, it is quite apparent that self-driving cars really can change the world. Lifestyle changes aside, the potential ecological benefits and the estimated "$1.3 trillion in annual savings to the U.S. economy" are reason enough to embrace this exciting technology.[184] However, Volvo's promise to "accept liability whenever one of its cars is in autonomous mode"[185] is misguided and even harmful. The industry needs human consumer involvement in order to continue to evolve safer technologies and systems. Engineers and executives can debate the Trolley Problem around a conference room table for months; it still will not provide the foundation example of a real-life situation.

A cynical person would accuse Volvo of deploying the promise as a marketing strategy: make the promise now and let the lawyers argue the details—what constitutes "autonomous mode," did the driver interfere or tamper with the operating system, was the computer properly maintained—later. A less-cynical person would give Volvo a little more credit and argue that it is simply stepping up where state and national governments are shuffling in the background, unable or unwilling to pass the legislation that will make our roads, and our lives, safer.

Of our fifty states and one district, only eight have passed legislation related to autonomous vehicles.[186] Of those eight, *none* have addressed driver/operator duties and responsibilities.[187] This is a disservice to our citizens. In the short-term, we need to codify a Designated Duty Passenger law. Our courts are already overburdened. The introduction of self-driving vehicles will no doubt result in multitudes of product liability cases—as it should—while we work to assure the safety of these vehicles. As motor vehicle and software companies rush to market, mistakes will be made. As a practical matter, having a Designated Duty Passenger

---

180. *Id.*
181. *Id.*
182. UNIV. OF WASH., *supra* note 164, at 18.
183. *Id.*
184. *Autonomous Cars*, *supra* note 40.
185. Korosec, *supra* note 5.
186. *Autonomous Self-Driving Vehicles Legislation*, *supra* note 9.
187. *See id.* (discussing all enacted autonomous vehicle legislation and noting that while there is legislation in Washington, D.C. and California requiring that a human driver be prepared to take over at any moment, there is no legislation currently in effect imposing a duty or liability on a driver/operator of an autonomous vehicle).

can reduce accidents and injuries resulting from those manufacturing errors.[188] As a legal matter, it brings a level of clarity that will not have to be over-litigated.

The best way to responsibly move this important technology forward is to make people—consumers—contribute to its advancement and evolution by taking responsibility. State legislatures can assure this happens. But they do not have much time. There will be at least 10 million Level 3 and Level 4 vehicles on our roads by 2020,[189] a scant three years away. Let us take responsibility.

188. Swanson, *supra* note 161, at 1119–20.
189. *See* Greenough, *supra* note 49.