Testimony of Daniel Hinkle for the American Association for Justice

Autonomous Vehicles: Promises and Challenges of Evolving Automotive Technologies

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House Energy and Commerce Committee

Good afternoon Chairwoman Schakowsky, Ranking Member McMorris, and members of the Committee. My name is Daniel Hinkle, and I am the Senior State Affairs Counsel for the American Association for Justice ("AAJ"). Thank you for the invitation to testify about automated driving.

AAJ, the world's largest trial bar with members in the U.S., Canada, and abroad, was established to safeguard victims' and survivors' rights, strengthen the civil justice system, promote injury prevention, and foster public safety. And as representatives for those injured, and those who may be injured by automated driving now and in the future, we are honored by the opportunity to work with this committee as it develops legislation that will protect and empower the public while promoting the safe deployment of this emerging technology.

In my current capacity as AAJ's Senior State Affairs Counsel, I have had the privilege of working on automated driving legislation at the state and federal levels over the last five years. I was an observer on the Uniform Law Commission's Uniform Automated Operations of Vehicles drafting committee. I have given dozens of presentations across the country and collaborated with countless experts in a quest to better understand the technology behind this emerging phenomenon.

AAJ believes that in order to best protect the public while fostering safety as well as innovation, any federal legislation designed to regulate automated vehicles must preserve: the traditional role of the states in ensuring safety on the roads, access to the courts under state laws for injured persons and damaged property, and the ability to access relevant information necessary to pursue such claims.

I'd like to start today with the big picture questions that bring us here: what is so different about automated vehicles and what distinguishes an automated vehicle from a human driven one?

It isn't hardware. Tesla[1] and Mobileye[2] claim they can achieve automated driving with cameras only. Cadillac is already equipping vehicles with LIDAR sensors for its Super Cruise system.[3] Automated driving relies on the same hardware installed on vehicles today.

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[1] Tesla Team, "All Tesla Cars Being Produced Now Have Full Self-Driving Hardware," October 16, 2016, https://www.tesla.com/blog/all-tesla-cars-being-produced-now-have-full-self-driving-hardware

[2] Jane Lanhee Lee, "Intel's Mobileye demos autonomous car equipped only with cameras, no other sensors" January 6, 2020, https://www.reuters.com/article/us-tech-ces-intel/intels-mobileye-demos-autonomous-car-equipped-only-with-cameras-no-other-sensors-idUSKBN1Z6091

[3] Cadillac, Super Cruise™, accessed February 5, 2020, https://www.cadillac.com/ownership/vehicle-technology/super-cruise

It isn't software either. As anyone can pull up on YouTube, there are dozens of videos posted daily of vehicles staying within their lane and following the traffic in front of them appropriately, all the while individuals sleep or do other inappropriate behaviors.[4] These vehicles are safely being driven within the bounds of the law by a software program, yet we still *rightfully* consider this human driving.

The difference between an automated vehicle and a human driven vehicle is a promise—a promise from the manufacturer of the automated driving system that their system can perform the entire dynamic driving task without in-vehicle supervision. It is this promise from the manufacturer to passengers, the public, the state, and the country that the maker of the *automated driver* will operate the vehicle safely within a certain domain and that it will not operate outside of that domain. A vehicle can have the same hardware and software installed on it, but without this promise it would not be considered an automated vehicle.

This *promise* is what allows a vehicle manufacturer to remove the steering wheel and pedals from a car. This *promise* is what gives a city or state the confidence to allow these vehicles on our roads. And this *promise* is what will ultimately allow these companies to build enough trust with the public to turn this technological experiment into an actual driving service. This promise is at the heart of any legislation on this issue and will lead to the other benefits, or harms, that automated driving presents.

The companies developing this technology know just how important this promise is. This promise from the manufacturer that "*we are the driver"* is at the heart of each company's marketing message around this technology. Waymo is "building The World's Most Experienced Driver™" and they are calling it the "Waymo Driver."[5] Cruise's CEO and founder promises that "…at the end of the day, you're not being driven by a robot. You're being driven by us."[6] Ford acknowledges that "part of earning the public's trust is to drive the vehicle in ways that other motorists, cyclists and pedestrians expect."[7] Every single company working on this technology has made some form of this promise.

This is what we are talking about when we talk about automated vehicles. Companies are building a driver to be installed in a vehicle, and these companies *promise* that they will drive safely on our roads and highways. The only question that remains—the question at the heart of any legislation on this issue—is whether our laws will hold these companies accountable to that promise.

AAJ's members represent the families whose lives are altered when a dangerous driver or vehicle hurts someone. As this committee is acutely aware, 36,560 people died in automobile collisions in 2018.[8] For some people testifying today, this is simply a statistic trotted out as a talking point to bolster the immediate need of speeding automated vehicles onto America's

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[4] For example, see ABC News, "Driver asleep at the wheel of his Tesla on busy freeway in Los Angeles," August 24, 2019. Available at https://www.youtube.com/watch?v=ZhObsMnipS8.
[5] https://waymo.com
[6] https://medium.com/cruise/why-our-people-matter-most-8d17e24c19d
[7] https://media.ford.com/content/dam/fordmedia/pdf/Ford_AV_LLC_FINAL_HR_2.pdf
[8] NHTSA, Traffic Deaths Decreased in 2018, but Still 36,560 People Died, accessed February 5, 2020, https://www.nhtsa.gov/traffic-deaths-2018

roadways. For our members, those 36,560 people are the parents, spouses, or children of their clients who have come to them for representation. Our attorneys represent these individuals in the elusive quest to obtain some measure of justice for them and their loved ones. Our members live and breathe this compounding national tragedy every single day.

AAJ is hopeful that this technology will save lives. Yet, for all the promise this technology holds, its results and impacts are not fully understood. For example, recent analysis has suggested that human drivers are still 10,000 times safer than automated drivers.[9] Some researchers have argued that automated driving may not achieve acceptable safety rates with the simplistic drive/fail/fix development process used in the past.[10] Others point to the brittleness of computer vision systems as a fundamental impediment to embedding them in safety-critical systems—like automated vehicles.[11] Today, automated vehicles have demonstrated challenges with bridges[12], turning left[13], spotting bicycles[14], or identifying animals in the road[15]. Also, reports suggest that the vision systems they use are subject to being tricked relatively easily.[16] And, of course, reports also suggest that they are a prime target for malicious hackers—maybe even foreign adversaries—wanting to take control of the vehicle while it is moving.[17]

Given the significant questions surrounding the current capabilities of automated vehicles, this committee must place the utmost priority on ensuring these vehicles are safe and adequately tested before mass deployment. And inherent to safety is public accountability.

The reality is that vehicle manufacturers have almost never voluntarily embraced safety technology without some precipitating force—and that force has most commonly been public accountability through the courts.

For over 50 years, lawsuits against vehicle manufacturers for design choices and failure to install safety technologies have spurred advancements in safety technology. From seatbelts to airbags to automated systems like electronic stability control, it is often the lawsuits that have led the way in showing when and how corporations make certain choices which prioritize profit over

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[9] Edwin Olson, CEO of May Mobility, "The Moore's Law for Self-Driving Vehicles," February 27, 2019, https://medium.com/may-mobility/the-moores-law-for-self-driving-vehicles-b78b8861e184
[10] Philip Koopman, Carnegie Mellon University, "The Heavy Tail Safety Ceiling," Automated and Connected Vehicle Systems Testing Symposium, June 2018, http://users.ece.cmu.edu/~koopman/pubs/koopman18_heavy_tail_ceiling.pdf
[11] Missy Cummings, Duke University, "Rethinking the maturity of artificial intelligence in safety-critical settings," AI Magazine, in review. http://hal.pratt.duke.edu/sites/hal.pratt.duke.edu/files/u39/2020-min.pdf
[12] Max Chafkin, Bloomberg Businessweek, "Uber's First Self-Driving Fleet Arrives in Pittsburgh This Month," August 18, 2016, https://www.bloomberg.com/news/features/2016-08-18/uber-s-first-self-driving-fleet-arrives-in-pittsburgh-this-month-is06r7on
[13] Amir Efrati, The Information, "Waymo's Foes: Left Turns and the Mean Streets of Phoenix," October 3, 2017, https://www.theinformation.com/articles/waymos-foes-left-turns-and-the-mean-streets-of-phoenix
[14] Peter Fairley, IEEE Spectrum, "The Self-Driving Car's Bicycle Problem," January 31, 2017, https://spectrum.ieee.org/cars-that-think/transportation/self-driving/the-selfdriving-cars-bicycle-problem
[15] Allana Akhtar and Jalopnik, Gizmodo, "Volvo's Driverless Cars Can't Figure Out Kangaroos," June 27, 2017, https://www.gizmodo.com.au/2017/06/volvos-driverless-cars-cant-figure-out-kangaroos/
[16] James Vincent, The Verge, "These stickers make computer vision software hallucinate things that aren't there," January 3, 2018, https://www.theverge.com/2018/1/3/16844842/ai-computer-vision-trick-adversarial-patches-google
[17] https://www.ft.com/content/6000981a-1e03-11e8-aaca-4574d7dabfb6

the health and safety of American families. When corporations must publicly answer for their decisions and which impact people's lives, those choices are made differently.

Today, there are serious questions regarding whether certain safety technologies should be widely deployed. Technologies like automatic emergency braking,[18] lane departure warnings,[19] and blind spot warnings[20] would prevent thousands of crashes and save hundreds of lives every year. Yet vehicle manufacturers have been slow to make them available at all, and when they do, they are often only offered as an upsell—an option for those who can afford it. Unlike automated driving, manufactures are not rushing to get this technology onto our roads.

What explains this divide between this safety technology, and automated driving? Because automated driving is not a safety technology. Automated driving is not inherently safe, nor inevitably safe. It is potentially safe. It is also a potentially *profitable* service. It is estimated that the total addressable market for automated driving could be over $7 *trillion* dollars,[21] which is why it is critical that this committee ensure that profitability and safety are in alignment as this technology is deployed.

How do we navigate this divide? How do we carve rules that harness the power of the market to *improve* safety while encouraging innovation and profit? How do we allow companies to invest and experiment with this technology, while simultaneously protecting the public and ensuring that the safest companies have the greatest advantage? The very simple answer is public accountability through our courts for any harm caused.

AAJ believes that it is essential that the law build in requirements to encourage corporations to act safely and efficiently by making parties responsible for the harm they cause. It is law and economics 101 that requiring the industry to take account of, or at least to consider, all the costs of their proposed activity (or the method of engaging in that activity) will lead to efficient investments in safety.

Take for example the tragic case of Brooke Melton and her parents. In March, 2010 Brooke Melton, a pediatric nurse from Georgia, died when the ignition switch on her 2005 Chevy Cobalt slipped from the "on" to the "accessory" position, leaving her without power steering or brakes and causing her to spin out of control into the opposite lane and crash into another car. It was her 29th birthday. Her parents, Ken and Beth, vowed they would find out what had caused their daughter death, and thus began a long fight against G.M. to uncover the truth.[22]

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[18] Jessica B. Cicchino, Insurance Institute for Highway Safety, "Real-world effects of General Motors Forward Collision Alert and Front Automatic Braking Systems," September 2018, https://www.iihs.org/topics/bibliography/ref/2170

[19] Jessica B. Cicchino, Journal of Safety Research, "Effects of lane departure warning on police-reported crash rates," September 2018, https://www.iihs.org/topics/bibliography/ref/2142

[20] IIHS Bulletin, Vol. 35, No. 34 "Compendium of HLDI collision avoidance research," September 2018, https://www.iihs.org/media/7560e1bf-fcc5-4540-aa16-07444f17d240/A25ptg/HLDI%20Research/Collisions%20avoidance%20features/35.34-compendium.pdf

[21] Kirsten Korosec, The Verge, "Intel predicts a $7 trilion self-driving future," June 1, 2017, https://www.theverge.com/2017/6/1/15725516/intel-7-trillion-dollar-self-driving-autonomous-cars

[22] Gabe Gutierrez, Rich Gardella, Kevin Monahan and Talesha Reynolds, Parents 'Boiling With Anger' After Daughter's Death in GM Car, NBC News, March 14, 2014, https://www.nbcnews.com/storyline/gm-recall/parents-boiling-anger-after-daughter-s-death-gm-car-n52316.

The Meltons hired Lance Cooper, an attorney based in Marietta, Georgia. Cooper initially had no reason to doubt the police report, which put Brooke at fault for driving too fast in wet conditions. Yet there were reasons to doubt this was a normal accident. Brooke had mentioned to her father that the car would occasionally shut off while driving and had had it serviced the weekend before the accident. Online discussion boards revealed other drivers who had experienced the same problems with their Cobalts. And nine days before the accident, G.M. had recalled 1.3 million vehicles, including Cobalts, because of an apparent power steering issue.[23]

Cooper hired engineer Charlie Miller to analyze the wreckage of Brooke Melton's Cobalt. Miller found that the car's key was not in the "on" position at impact, but the "accessory" position, in which lights and radio work but the engine itself is not on. Furthermore, the car's data recorder showed that between three and four seconds before the crash the car's speed had apparently dropped from 58 miles per hour to standstill – a fact that did not match the accident report.

Discovery in the case proved decisive. According to the company's internal documents, G.M. had become aware that it had a problem with ignition switches as early as 2001. G.M. reported a design change had fixed the problem, but the problem resurfaced again in 2004 during test drives of the Chevy Cobalt. G.M. explored a number of solutions, but then *decided not to fix it*, because of the cost and time involved.[24] Internal documents show G.M. estimated a fix would add about 90 cents to the cost of each car, but concluded "[N]one of the solutions represents an acceptable business case."[25] Instead, the company issued a service bulletin to dealers in December 2005, advising them to tell drivers to remove heavy objects from keychains.[26]

In 2006, G.M. finally modified the ignition switches for its future 2008 models but did nothing about the cars already on the road. Making the situation even more dangerous, G.M. never changed the part number on the new switch, meaning some cars were inadvertently repaired with the defective switch.[27] The National Highway Traffic Safety Administration (NHTSA) learned of the defect in 2007, yet G.M. insisted there was no problem. Despite 29 complaints, four fatal crash reports and 14 field reports, NHTSA decided there was no trend and took no action.[28]

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[23] Max Blau, No Accident: Inside GM's deadly ignition switch scandal, Atlanta Magazine, January 6, 2016, https://www.atlantamagazine.com/great-reads/no-accident-inside-gms-deadly-ignition-switch-scandal/.
[24] Gabe Gutierrez, Rich Gardella, Kevin Monahan and Talesha Reynolds, Parents 'Boiling With Anger' After Daughter's Death in GM Car, NBC News, March 14, 2014, https://www.nbcnews.com/storyline/gm-recall/parents-boiling-anger-after-daughter-s-death-gm-car-n52316.
[25] Eric Beech, Paul Lienert, Richard Cowan, Documents show GM's early knowledge of switch defect, Reuters, April 11, 2014, https://www.reuters.com/article/us-gm-recall/documents-show-gms-early-knowledge-of-switch-defect-idUSBREA3A1MH20140412.
[26] Tanya Basu, Timeline: A History Of GM's Ignition Switch Defect, NPR, March 31, 2014, https://www.npr.org/2014/03/31/297158876/timeline-a-history-of-gms-ignition-switch-defect.
[27] Brad Plumer, The GM recall scandal of 2014, Vox, May 11, 2015, https://www.vox.com/2014/10/3/18073458/gm-car-recall.
[28] Tanya Basu, Timeline: A History Of GM's Ignition Switch Defect, NPR, March 31, 2014, https://www.npr.org/2014/03/31/297158876/timeline-a-history-of-gms-ignition-switch-defect.

A "new G.M." emerged from bankruptcy continuing to maintain there was no problem with its cars and took a hard line with those who suggested otherwise. As recently as September 2013, G.M.'s lawyers were threatening families whose loved ones had been injured or killed because of the defect, saying that they would come after them for sanctions and attorneys' fees if they tried to pursue their claims.[29]

Finally, in 2014, the Melton's long-fought lawsuit forced G.M. to admit that it had known all along that the ignition switches were defective. In January 2014, G.M. began the recall of what would eventually become more than 2.5 million cars.

If this committee is going to diminish the probability that other families are forced to endure what the Meltons endured, the federal framework for automated vehicles must clearly and specifically preserve the rights of individuals to hold manufacturers publicly accountable. Doing so will powerfully incentivize manufacturers to take account of all the costs of a particular action, and lead to efficient investments in safety. Accomplishing this goal requires any automated vehicle legislation to address four key points:

First, those who are injured or harmed by automated driving must be able to hold the driver manufacturer accountable. This means any legislation must explicitly avoid preempting any remedy available under state law. This also means that any legislation must address any existing immunities currently codified in federal law.

For example, several states have already passed laws regarding automated vehicle accountability that directly implicate federal rules protecting rental car companies from liability. In Texas, legislation makes the owner of an automated vehicle responsible for its safe operation, regardless of whether the owner has control or knowledge about how the automated driving system operates.[30] Congress has previously said states cannot impose vicarious liability upon an owner engaged in the rental car business, therefore, Congress must deal with this issue in one way or another, or we will find ourselves in a position where *no one* is responsible for the safe operation of the automated vehicle. Failure to address this loophole means some companies will not be held responsible for the harms that they cause. When they don't pay, guess who does? The individual who was harmed through no fault of their own.

Second, those who are injured or harmed must be able to hold the manufacturer accountable in a court room and not be forced into arbitration. Forced arbitration is a one-sided, secretive, and rigged system which effectively immunizes the company from all public accountability. The one-sided and secretive nature of forced arbitration is established at the onset wherein companies, rather than individuals, choose the private company which will administer the forced arbitration proceeding, the payment terms, and the rules, including the time and location of the proceeding, under which the forced arbitration will take place. Forced arbitration proceedings provide none of the enforceable legal safeguards which serve to protect and empower individuals when they file a claim in court; this includes the ability to speak out

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[29] Hilary Stout, Bill Vlasic, Danielle Ivory and Rebecca R. Ruiz, General Motors Misled Grieving Families on a Lethal Flaw, New York Times, March 24, 2014, https://www.nytimes.com/2014/03/25/business/carmaker-misled-grieving-families-on-a-lethal-flaw.html.

[30] Texas Senate Bill 2205 (2017), https://www.capitol.state.tx.us/BillLookup/History.aspx?LegSess=85R&Bill=SB2205

publicly about what happened, the right join with others to bring a claim through a class action, the ability to obtain key evidence necessary to prove one's case, and the ability for any meaningful appeal of a forced arbitration provider's ruling.

In addition to the outright total deprivation of rights, such proceedings will always be inherently unfair and biased in favor of the company because forced arbitration providers are dependent on the company in order to get repeat business. Uber decides which forced arbitration provider shall be designated in its millions of passenger "agreements," and Uber decides when to change that provider. This bias is demonstrated by the Economic Policy Institute's finding that consumers obtain relief regarding their claims in only 9 percent of disputes whereas companies are granted relief 93 percent of the time when they make claims or counterclaims.[31] Given how rigged this system is against consumers and passengers, most people give up pursuing their rights altogether, effectively allowing their claims to be silenced and the company to be immunized from all public accountability.

Perhaps worst of all, an inherent characteristic of forced arbitration is that it is virtually always confidential.

1) Take for example the case of *National Federation of the Blind of California v. Uber Technologies, Inc.*, where the National Federation of the Blind of California and its members brought a lawsuit against Uber for discriminating against blind persons by refusing to transport guide dogs in violation of the Americans with Disabilities Act and similar California laws.[32] Rather than address the issue, Uber attempted to force the National Federation of the Blind of California and its members into secretive arbitration.

2) Take for example the case of *Ramos v. Uber Technologies, Inc*, in which Elizabeth Ramos, a woman who brought a lawsuit against Uber for failing to provide her with an accessible vehicle, in violation of New York state and New York City human rights laws. Rather than addressing its own failure to provide Ms. Ramos with a ride after she waited an hour and was denied a ride three times due to her disability, Uber attempted to force Ms. Ramos into private arbitration. Companies, like Uber in this example, try to compel arbitration the second a claim is filed against them largely for one reason: here are no public recordings of filings, there are no public hearings, and there are no published decisions. Secrecy almost always serves the interest of a corporate defendant seeking to keep knowledge of their actions from the public's view, but this point is especially key when the actions involve a largely unproven and evolving technology.

Importantly, there is precedent in the area of forced arbitration and cars: 15 U.S.C. § 1226, the Motor Vehicle Franchise Contract Dispute Resolution Process Act. In 2001, Senator Orrin Hatch (R-UT) introduced similar legislation "to protect auto dealers from having mandatory arbitration clauses imposed upon them by auto manufacturers, due to their unequal

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[31] Shierholz, Heidi. (2017, August 1). *Correcting the record: Consumers fare better under class actions than arbitration.* Retrieved from https://www.epi.org/publication/correcting-the-record-consumers-fare-better-under-class-actions-than-arbitration/.

[32] See National Federation of the Blind of California v. Uber et al., 103 F.Supp.3d 1073 (N.D. Cal 2015) denying Uber's motion to dismiss and dismissing Uber's argument that NFBC lacks standing because some of its members had signed arbitration agreements.

bargaining power."[33] As Senator Grassley (R-IA) commented in support of the bill, the goal of the legislation was to ensure that "the selection of arbitration is voluntary and fair."[34] As the National Automobile Dealers Association wrote to members of Congress at the time, they do not "support or encourage the use of mandatory binding arbitration in any contract of adhesion, whether a motor vehicle franchise contract between a manufacturer and dealer or a consumer contract."[35] Automobile dealers clearly understood the value in being able to take manufacturers to court, and took advantage of this in the litigation over the Volkswagen emission scandal.[36] It is critical that these protections against forced arbitration are extended to consumers in any federal legislation dealing with automated driving.

Finally, a point that is less commonly observed is the fact that forced arbitration prevents common law rules from developing and clarifying what the law *is* regarding liability. It took over 50 years to go from *MacPhereson v. Buick Motor Co.*, 111 N.E. 1050 (N.Y. 1916) to *Elmore v. American Motors Corp.*, 70 Cal. 2d 578 (Cal. 1969) in fashioning the contours of product liability for an automaker. Without the ability to bring litigation publicly before a judge, rational and fair rules forged in litigation that have *unquestionably* protected Americans from dangerous vehicles could never have developed.

And as a practical matter, if we walked down any main street in America and polled people, my guess is that none of them would assume that if they are injured or killed by a car that doesn't have a human driver, they have no rights to seek public accountability under the law.

Third, the driver manufacturer must be held accountable for following the rules of the road. Every state has a set of rules for drivers. If a driver violates a rule and hurts someone in the process, they can be held responsible for the harm their driving caused. This simple, matter of fact understanding of the rules *must* be preserved with automated vehicles by naming—and holding—the automated driver accountable.

Holding the driver manufacturer accountable is not an added burden on these manufacturers as they will *necessarily* have an ongoing responsibility for the automated driving system. All these systems rely on detailed, up-to-date roadway maps to assist in navigation. Machine vision systems required constant updates to keep abreast of changing road conditions—for example, many needed to be updated to address the widespread introduction of standup electric scooters. If automated driving systems are going to improve driving safety, then manufacturers will necessarily have an ongoing duty to maintain control over those systems to ensure they are operating vehicles reasonably under evolving road conditions.

As trial lawyers, AAJ's members routinely see the harm done by what some might deem a "minor auto accident." For those who have been in auto collisions, time off work can have

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[33] Statements on Introduced Bills and Joint Resolutions, United States Senate, June 29, 2001. Statement by Senator Hatch of Utah.

[34] Statements on Introduced Bills and Joint Resolutions, United States Senate, June 29, 2001. Statement by Senator Grassley of Iowa.

[35] National Automobile Dealers Association letter to U.S. Rep. Jerrold Nadler, July 12, 2000, posted at: http://carconsumers.org/pdf/arbitration_NADA_letter_to_Congress.pdf

[36] Mike Spector, Wall Street Journal, "

devastating consequences. Forty percent of Americans can't cover a $400 emergency expense.[37] When income stops coming, bills don't get paid, meals get skipped, and anxiety ensues. The civil justice systems across the country play an important role in helping victims in auto crashes pick up the pieces and recover just compensation for their losses. The harm that can be done in even a minor collision can totally devastate your constituents' lives.

This is another reason why any legislation addressing automated driving must hold the manufacture of the automated driver responsible for following the rules of the road. A bicyclist doesn't care if they were hit by a human driver or an automated driver, they care that they were hit at all. Automated driving manufacturers should not be allowed to hide from their responsibility to follow the rules of the road just like everyone else.

In addition to deterring dangerous driving and fairly compensating those who have been hurt through no fault of their own, the civil justice system plays a critical role in serving justice by holding dangerous drivers publicly accountable. As everyone has acknowledged, from NHTSA to lawmakers to the companies themselves, *trust* is the biggest hurdle to public acceptance of automated vehicles. Identifying the manufacturer of the automated driver as the entity responsible for driving clarifies who we are placing out trust in to drive safely. It confirms that our American values of justice will continue to apply—that someone is behind the wheel and taking responsibility for these vehicles. Laws clarifying who is responsible *allows* us to trust these companies on this issue.

Further, distinguishing automated drivers protects those companies who chose to invest in safety. Naming the driver allows those hurt by a dangerous automated driver to hold them accountable without foreclosing *trust* in other automated driving providers, or automated vehicles generally.

On the other hand, if we do *not* clarify who is responsible then it is entirely possible that the entire automated driving industry is implicated in every collision. Every collision will devolve into a tragic game of finger pointing. In the end, each company will implicate the whole project of automated driving because it takes away from their own personal culpability.

Or it could be worse. If driver responsibility is not clarified, companies may design their systems to keep a human being in the loop as a "moral crumple zone."[38] Just like the crumple zone in a car is designed to absorb the force of impact in a crash, the human in a highly complex and automated system may become simply a component that bears the brunt of the moral and legal responsibilities when the overall system malfunctions. It is well understood in some circles that there is a counter-intuitive focus on human responsibility even while human action is increasingly replaced by automation. Employing humans as a "moral crumple zone" may even create additional risk from dangerous driving, but that is unlikely to dissuade companies from employing this strategy so long as they can effectively shift blame to a human "moral crumple zone."

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[37] Soo Youn, ABC News, "40% of Americans don't have $400 in the bank for emergency expenses: Federal Reserve" May 24, 2019, https://abcnews.go.com/US/10-americans-struggle-cover-400-emergency-expense-federal/story?id=63253846

[38] M. C. Elish, Engaging Science, Technology, and Society (pre-print), "Moral Crumple Zones: Cautionary Tales in Human-Robot Interaction" March 1, 2019, https://ssrn.com/abstract=2757236

Through the long-term work of the civil justice system in coordination with smart and effective regulation, the best, and safest, technologies will come to market. If providers are willing to make a promise that their system is capable of safe driving, then they should be held accountable for that promise. On the other hand, if they are allowed to operate automated vehicles without being accountable, then none of the promised safety benefits of automated driving will ever come to pass. This committee should remain committed to putting common sense rules in place to protect our citizens from dangerous drivers—human and automated alike.