# Autonomous Vehicle Technology: Trends & Considerations for Litigation

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Although we are decades away from autonomous commercial trucks traveling our roadways, there are already well over 100 different vehicles using autonomous driving technologies being driven by consumers and tested by companies around the United States. According to the National Conference of State Legislatures, 41 states have enacted legislation and executive orders relating to autonomous vehicles since 2012.[1] The Department of Transportation, in conjunction with market-share automobile manufacturers and commercial trucking industry leaders, are actively pursuing widespread implementation of high and full level automation in transportation.[2] Safety concerns often emerge with the introduction of new automotive technology. As plaintiff lawyers immersed in motor vehicle and commercial truck law, it is essential for us to monitor developments and safety in autonomous vehicle technology are affecting liability and litigation of personal injury claims.

## CURRENT LEVELS OF AUTOMATED DRIVING TECHNOLOGY

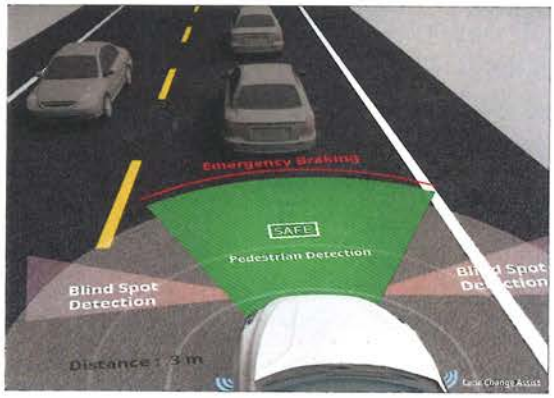
The characteristic inherent to a truly "autonomous" or "self-driving" vehicle is a driving system which incorporates various individual Automated Driving Technology (ADT) (i.e., automated lane assistance, cruise control, emergency braking, forward collision warning, navigation, etc.) which work in sync to operate the vehicle without human assistance. The technology replaces the standard performance of an internal combustion engine with electronic processor software. ADTs are not standardized; consequently, the safe operation of an autonomous vehicle unequivocally relies on proper evaluation and management of environmental factors by the ADTs using sensors, radar, and cameras designed by the specific manufacturer.

The terms self-driving, autonomous, driverless, and highly automated are often used interchangeably in the broad discussion of automated technology. The Society of Automotive Engineers (SAE) created an automation spectrum for vehicles, consisting of Automation Levels 0 to 5 (no automation to full automation without human driver assistance).[3] Currently, 13 automakers have fleets of vehicles operating in the United States at Automation Levels 1, 2, and 3. Level 1 Driver Assistance is specific execution by a driving system of either steering or acceleration/braking with the options of lane centering or adaptive cruise control with the expectation the human driver performs all remaining aspects of the driving task.[4] Level 2 Partial Automation combines the use of steering and acceleration/braking with simultaneous lane centering and adaptive cruise control with the expectation a human driver performs all remaining aspects of the driving task.[5] Level 3 Conditional Automation is specific performance by a driving system of all aspects of the driving task under limited conditions with the expectation the human driver will respond appropriately to a request to intervene.[6] For the purpose of this article, the term "autonomous vehicle" (AV) will reference automated vehicle technologies Levels 1-3 in operation on our roadways.

From the perspective of personal injury litigation arising from motor vehicle and commercial truck collisions, the nature of current ADT begs thorough evaluation of potential products liability claims along with typical negligence claims in all cases.

## "FLEXIBLE" SAFETY REGULATIONS OPEN THE DOOR TO LITIGATION

The robustness of Autonomous Driving Technology (ADT) currently available varies widely among credible sources. Government, industry, and private proponents of rapid development of ADTs are motivated not only by collision prevention and avoidance, but by the potential significant reduction of costs, emissions, commerce and mobility inefficiencies. Opponents cautious of rapid development are concerned the available ADTs are not proficient enough to replace the complex intuitiveness of a human driver and point to significant safety risks in allowing the unperfected technologies into the stream of commerce.




In discussion of advancements and obstacles in ADT research and design, Dr. John Lenneman, a leading engineer at Toyota Motor North America's Collaborative Safety Research Center, commented on ADT suggesting, "nobody is doing this well. Everyone should be doing this better. The goal is to make intuitive technology... more resources need to be put toward developing intuitive technologies to begin with."[7] Industry consensus is fleet testing on public roadways is essential to developing intuitive ADT, but it readily acknowledges this approach presents safety risks that must be closely monitored.[8]

The DOT intends for current regulations to be "flexible" and remain technology-neutral to promote competition, innovation, and rapid development of a true autonomous driving system requiring no human assistance.[9] The federal government, alongside most state governments, allow fleet testing of all AVs on roadways under certain parameters, such as permit approval and the inclusion of a "safety driver" or "backup driver." The driver is an employee of the company and is responsible for all driving tasks, even when autonomous mode is engaged. The safety driver is trained to take control of the vehicle in the event its use becomes unsafe. However, the National Transportation Safety Board (NTSB) signaled a review of this policy amid the conclusion of its investigation into the fatal self-driving Uber collision in March 2018. NTSB said state and federal regulators need to do more to safeguard the public, noting the lack of federal safety standards for automated driving systems.[10] NTSB Chairman Robert Sumwalt asserted, "the collision was the last link of a long chain of actions and decisions made by an organization that unfortunately did not make safety the top priority."[11]

In the near term, NTSB's recent remarks offer manufacturers of AVs, most notably Tesla, Mercedes, GM, Google, Toyota, Audi, Volvo, and Nissan, a word of caution as

Continued on page 62.

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Autonomous Vehicle Technology, Continued from page 61.

they proceed with product development. Currently, AVs are approved for sale and operation provided they pass Federal Motor Vehicle Safety Standards testing in place for Level 0, non-automated vehicles.

## A LOOK AT PENDING LITIGATION INVOLVING AUTONOMOUS VEHICLES

As more AVs enter into the hands of consumers, we have seen an emergence of injury claims settled and lawsuits filed involving vehicles with autonomous driving mode engaged. A majority of the cases involve AVs traveling at low speeds. A distinguishing factor in litigation is whether the vehicle is a part of fleet testing or consumer use at the time of the crash. The number of collisions involving AVs will continue to increase each year for the foreseeable future, as fleet testing scales upward, more vehicles are placed in commerce, and technology is improved. In cautious anticipation of the future of motor vehicle and commercial truck litigation, we look to noteworthy recent and pending litigation involving AVs for insight.

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## FLEET TEST AUTOMATION COLLISIONS

In January 2018, the first personal injury lawsuit was filed involving an AV. California resident Oscar Nilsson sued General Motors, LLC, for basic negligence. A GM Cruise fleet vehicle with safety driver operating in autonomous mode swiped his motorcycle, knocking him to the ground, causing shoulder and neck injuries.[12] Nilsson's complaint focused on the failure of GM's safety driver to operate the Cruise in a proper manner.[13] The GM Cruise was using lane-centering technology at the time and did not detect Nilsson as an object to avoid.[14] GM asserted Nilsson was responsible for the crash, as San Francisco police determined Nilsson was at-fault for improperly attempting to overtake the GM Cruise.[15] No discovery was conducted, and the parties reached a confidential settlement agreement shortly after the lawsuit was filed.

In March 2018, the first fatal collision occurred involving a fleet test AV. Elizabeth Herzberg was walking her bicycle across a highway in Tempe, Arizona. Herzberg was hit and killed by an Uber Volvo XC90 fleet vehicle with safety driver operating in autonomous mode.[16] NTSB chose to investigate the crash and was provided all proprietary systems data on the vehicle, including camera footage of the incident. NTSB determined the immediate cause of the crash was Uber's Advanced Technologies Group (ATG)'s safety driver driving distracted by her cell phone and failed to closely monitor the road and operation of vehicle.[17] NTSB cited Uber ATG for having an "inadequate safety culture," resulting from its failure to have adequate safety risk assessment procedures, effective oversight of vehicle operators, and adequate mechanisms for addressing operator automation complacency.[18] An eyebrow-

raising finding, NTSB scolded Uber ATG for disabling Volvo's factory-installed automatic emergency braking and collision forewarning features, which likely would have prevented the crash, in favor of performance of its own similar proprietary technologies.[19] If litigation was pursued, it could have been argued Herzberg was contributory due to impairment and failing to use a marked crossing. However, Uber and Herzberg's family reached a confidential settlement one week after the crash.

Inherent within the construction of current AV regulations is two assumptions: allowance of testing unperfected and potentially dangerous technology in a public environment, and acknowledgment that technological failures in that environment will occur and can result in harm to the public. Thus, regulatory "flexibility" requires a legal failsafe, an effective band aid to protect unsafe, ADT testing. The legal requirement of the safety driver effectively shields manufacturers conducting testing against liability for failures and defects of proprietary automated technology. Until regulations are strengthened, plaintiffs' claims against manufacturers for crashes involving fleet test motor vehicles or commercial trucks will follow the trajectory of a typical wreck case against an owner company and its employee, including claims for negligent operation, hiring, training, supervision, retention, maintenance, etc. This is despite the parties' mutual awareness that failure of particular ADTs may have substantially contributed to the cause of the crash.

## CONSUMER USE AUTOMATION COLLISIONS

Consumer use AV collisions is the primary arena we anticipate potentially successful products liability claims to operate in conjunction with standard negligence claims in motor vehicle and commercial truck litigation. One glaring issue, however, is the manufacturers have an ability to quickly tweak and update software in attempt to correct any failures that cause or contribute to crashes. This works to decrease the likelihood the same or similar failures will happen exactly the same way in the future.

On May 7, 2016, the first fatal collision occurred involving a consumer-operated AV in the United States. Joshua Brown was operating his Tesla Model S in autonomous mode on a highway in Williston, Florida. A tractor trailer pulled away from a stop sign and drove across the highway in attempt to turn left in front of Brown. The Tesla failed to recognize the tractor trailer as a collision threat. Brown was killed when his Tesla drove underneath the tractor trailer. NTSB's determined the primary causes of the crash to be the truck driver's failure to yield the right of way and Brown's inattention due to over-reliance on AutoPilot, a Level 2 system at the time.[20] NTSB could not determine the exact cause of the inattentiveness of Brown. NTSB issued an interesting report of findings, including design defects: AutoPilot's design lacked system safeguards and allowed the driver's over-reliance and use in ways inconsistent with manufacturer guidance and warnings; failed to engage forward collision warning, automated cruise control, and automatic emergency braking systems; failure of AutoPilot to restrict its operation to certain conditions as designed.[21] While Tesla publicly confirmed the AutoPilot failures, it explained that the Model S did not detect Brown's hands on the wheel prior to impact and automated cruise control was set above the posted speed limit.

Continued on page 64.

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Autonomous Vehicle Technology, continued from page 63.

Shortly after the crash, Tesla released an update claiming to be in compliance with NTSB's order to correct the deficiencies cited. Brown's family did not desire to pursue litigation, but this case would have been ripe for an introduction to the first products liability claims against a manufacturer of an autonomous driving system. The Brown family's attorney did not publicly confirm whether any settlement agreement was reached with Tesla.

However, in 2019, there were two wrongful death lawsuits filed against manufacturer Tesla for failures of its AutoPilot system. On April 26, 2019, the first wrongful death lawsuit against a manufacturer of a consumer-operated AV was filed by the family of Walter Huang in Santa Clara County Superior Court of California. On March 23, 2018, Huang was operating his Tesla Model X on AutoPilot on a highway in Mountain View, California. Huang was killed when his Tesla misread the lines on the roadway, failed to detect the presence of a concrete median divider, and accelerated into the divider. NTSB is investigating all aspects of the crash and the performance of AutoPilot, considered by some to be a Level 3 driving system at the time, with specific focus on traffic-aware cruise control, auto-steer and lane-keeping assistance, and automatic emergency braking technologies.[22] A final report has not been issued.

On August 6, 2019, the second wrongful death lawsuit was filed against Tesla by the family of Jeremy Banner in Palm Beach County Circuit Court for the State of Florida. On May 1, 2019, Banner was killed when he was operating his Tesla Model 3 on AutoPilot on a highway in Delray Beach, Florida. The pertinent facts of how the crash occurred are almost exactly the same as the aforementioned Brown crash. You will recall Tesla issued an update after the Brown crash purporting to correct the deficiencies in AutoPilot as cited by the NTSB. NTSB is investigating all aspects of the crash, including the performance of Autopilot.

The Huang and Banner families claim similar negligence, products liability, and wrongful death causes of action against Tesla, Inc. Both lawsuits assert Tesla, Inc., owed plaintiffs a duty to use reasonable care in the design, manufacture, assembly, distribution and sale of the Tesla vehicle, as well as a duty to ensure each vehicle was safe for the intended and foreseeable use, including inadequate crash-worthiness. Plaintiffs argue Tesla knew its proprietary AutoPilot system, an integral characteristic to the vehicle, was defective, dangerous, and failed to function as designed to prevent and avoid collisions. Despite Tesla's knowledge, Plaintiffs assert Tesla placed vehicles into the steam of commerce and advertised AutoPilot as safer than human drivers and better at preventing collisions. Tesla failed to provide adequate warnings to consumers of the known defects and dangers associated with AutoPilot's intended and foreseeable use. Plaintiffs indicate Tesla has never recalled vehicles from the marketplace to correct known defects, and in the Banner case, the known defects were not actually corrected. Plaintiffs argue at the time of both crashes, the vehicles were being used in the manner intended and as advertised, as Tesla was aware the ordinary consumer would use them. However, said failures directly caused the deaths of Huang and Banner.

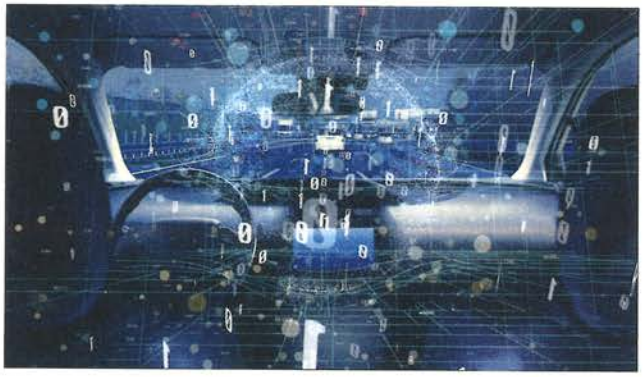
Tesla, Inc.'s answers are based on the assertion the deceased drivers were negligent and contributory to their deaths in the operation of the vehicles. Specifically,

"Plaintiffs argue Tesla knew its proprietary AutoPilot system, an integral characteristic to the vehicle, was defective, dangerous, and failed to function as designed to prevent and avoid collisions."

Tesla argues the vehicles were abnormally used or misused, contrary to what Tesla intended in the design, manufacture, and warnings provided with the vehicles. Tesla claims its own actions were not substantial factors in causing injury to plaintiffs. Tesla avers each vehicle met all applicable Federal Motor Vehicle Safety Standards prior to the time of sale and placement into the marketplace, a direct tip to the inadequacy of AV regulations. Tesla argues Plaintiffs and decedent drivers knowingly, voluntarily, and freely placed themselves in unsafe and dangerous positions, assuming the risk of all injuries.

## CURRENT BARRIERS TO AUTONOMOUS VEHICLE LITIGATION FOR PLAINTIFFS

Both cases are in the discovery phase of litigation, and no significant rulings or orders have been issued at this time. Access, storage, and preservation of data are the most significant issues, and event and ADT system data for the time of the crash are not easily accessible. The current regulations do not require event data or system data on AVs to be captured and made available in standard formats. Accident reconstruction engineers have equipment and software capable of retrieving data present on the airbag control modules, as with non-AVs. However, the data file in most AVs is encrypted, and only manufacturers have software capable of reading and interpreting the data. Once the encrypted data file is sent to the manufacturer, there is no mechanism of proving the data interpretation provided by the manufacturer is complete and accurate. Additionally, there is no way to access ADT system data in the same manner. Reliance on the manufacturer for this is concerning as each manufacturer's ADT system is comprised of various individual technologies considered proprietary.



Another issue is storage and preservation of data mined over time from software and updates that are made to the software. Manufacturers of AVs for fleet testing and consumer use continually live stream data from the vehicles in operation in order to improve the ADT software. On point, Tesla regularly touts its drivers have logged over one billion miles with AutoPilot engaged, providing it with a massive amount of information on the performance of its technologies. Access to ADT performance data is crucial to all aspects of plaintiffs' claims in these cases. It would provide a look at patterns, trends, procedures, and recurrent system issues with the particular vehicles involved in crashes. Due to the process of continually improving and updating software, it is unknown whether all previous software, manuals, engineering plans and schedules are preserved for evaluation. There is no requirement of the manufacturers testing AVs to keep records of or report incidents, crashes, technological failures, mechanical failures, operational deficiencies, etc., to the federal government. Again, being able to access information regarding other similar incidents and significant histories is crucial.

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Autonomous Vehicle Technology, continued from page 65.

Over the next year, we can expect to see how the courts handle these particular issues through responses to discovery motions and protective orders. NTSB has made repeated safety recommendations to the DOT, NHTSA, and the Alliance of Automobile Manufacturers and Global Automakers requesting strengthened and specific AV regulations, including requiring reporting, recording, storage, and standardizing access to data.

## EXPECTATIONS FOR FUTURE LITIGATION INVOLVING AUTONOMOUS VEHICLES

NHTSA and NTSB do not investigate every crash involving an AV with autonomous mode engaged. NTSB has not yet issued a conclusion suggesting current ADT technologies, Automation Levels 0-3, are defective. This seems to be due to lack of standardization, weak AV regulations, and information provided by manufacturers revealing their awareness of the true capabilities and limitations to their autonomous systems.

Out of the cases reviewed, the only final report issued by NTSB for an AV collision with autonomous mode engaged is in the Brown crash.[23] The NTSB concluded the automated technologies at issue failed to engage and prevent the crash, but the technologies were not defective in design or performance. Automatic emergency braking systems are the focus of ADT investigations, because even if other ADTs fail, braking ultimately prevents collisions. NHTSA explains automatic emergency braking systems used in the automotive industry are designed as rear-end collision avoidance technologies and are not designed to reliably perform in all crash modes, including crossing path, stationary objects, cutting in or cutting out scenarios.[24] NHTSA and NTSB continue to place responsibility on the drivers of AVs, explaining autonomous driving systems are advanced driver assistance systems designed to require the continual and full attention of the driver to monitor the traffic environment and to be prepared to take action to avoid crashes.[25] NTSB suggested the Brown crash serves as a reminder that equipping large, heavy commercial trucks with ADT would improve the safety of our roadways, but safety risks of ADT will continue to be at issue until it is standard on all vehicles.[26] Despite the bold posture of proponents of autonomous driving systems, the most credible of them recognize the integration of standard ADTs into motor vehicles and commercial trucks is lot farther into the future than the mainstream is predicting.

From a litigation perspective, evolution will be slower moving but undoubtedly significant with each case pursued. It is and will continue to be incredibly difficult to succeed in placing any liability on automobile manufacturers and technology companies for the failures or malfunction of their autonomous driving systems.

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[1] *Autonomous Vehicles | Self-Driving Vehicles Enacted Legislation*, National Council of State Legislatures (October 9, 2019). Retrieved from http://www.ncsl.org/research/transportation/autonomous-vehicles.

[2] *Automated Vehicles 3.0: Preparing for the Future of Transportation*, US Department of Transportation (October 2018).

[3] *SAE J3016™: Taxonomy and Definitions for Terms Related to On-Road Motor Vehicle Automated Driving Systems*, The Society of Automotive Engineers (June 15, 2018).

[4] *Id.*

[5] *Id.*

[6] *Id.*

[7] John K. Lenneman. *Safe Autonomous Mobility – Human Cognition & Behavior in Automated Driving Systems*, Collaborative Safety Research Center, Human-Technology Integration (Presented November 20, 2019).

[8] *Automated Vehicles 3.0: Preparing for the Future of Transportation*, US Department of Transportation (October 2018).

[9] Id.

[10] David Sheperdson, *Uber, Distracted Backup Driver Cited by NTSB in Fatal Self-Driving Crash*, Thompson Reuters (November 19, 2019).

[11] *Id.*

[12] *See* Complaint, *Oscar Willhelm Nilsson v. General Motors*, LLC, No. 4:18-cv-00471 (N.D. Cal.).

[13] *Id.*

[14] *See* Answer, *Oscar Willhelm Nilsson v. General Motors*, LLC, No. 4:18-cv-00471 (N.D. Cal.).

[15] David Shepardson, *GM Settles Lawsuit with Motorcyclist Hit by Self-Driving Car*, Thompson Reuters (June 1, 2018).

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[18] *Id.*

[19] *Id.*

[20] *Driver Errors, Overreliance on Automation, Lack of Safeguards, Led to Fatal Tesla Crash*, News Release, National Transportation Safety Board Office of Public Affairs (September 12, 2017).

[21] *Id.*

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[23] *Collision Between a Car Operating with Automated Vehicle Control Systems and a Tractor-Semitrailer Truck near Williston, Florida*, Highway Accident Report, National Transportation Safety Board (October 12, 2017).

[24] *ODI Resume: Investigation PE 16-007*, Office of Defects Investigation, National Highway Traffic Safety Administration, U.S. Department of Transportation (January 19, 2017).

[25] *Id.*

[26] *Collision Between a Car Operating with Automated Vehicle Control Systems and a Tractor-Semitrailer Truck near Williston, Florida*, Highway Accident Report, National Transportation Safety Board (October 12, 2017).

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