

ILLINOIS BUSINESS LAW JOURNAL



HANDS OFF THE WHEEL: AN ANALYSIS OF ETHICAL AND LEGAL ISSUES FACING AUTONOMOUS AUTOMOBILES



❖ NOTE ❖

*George Cortina**

TABLE OF CONTENTS

I. INTRODUCTION	13
II. BACKGROUND	14
A. The Beginnings of Autonomous Driving.....	14
B. The Future of Autonomous Driving	15
III. ANALYSIS	16
A. The Ethical Questions of Autonomous Vehicles.....	16
B. The Laws and Regulations of Autonomous Cars	18
IV. RECOMMENDATIONS	21
V. CONCLUSION.....	23

I. INTRODUCTION

We have witnessed an evolution in automobile safety over the last several years. Safety features range from sensors that ensure a car remains in its proper lane, standard back-up cameras, adaptive cruise control systems, and pedestrian detection technologies. These features, designed to protect both the driver and the world around him, appear to be incremental steps to the advent of the day that we see fully autonomous cars. Many auto manufacturers and businesses are already embracing the idea of autonomous automobiles. In fact, Dominos has partnered with Ford and is using autonomous vehicles to deliver pizzas in Ann Arbor,



*J.D. Candidate, Class of 2020, University of Illinois College of Law.

Michigan.¹ The impetus in the automotive world appears to be fully embracing autonomous vehicles, however, it is unclear if our legal system is prepared for this change. There are many unanswered questions and potential issues that arise from the concept of a completely self-driving car that our legal system must address before we start taking our hands off the wheel.

Part II of this note provides background into some of the precursors to autonomous driving that exist today and the new autonomous driving functions that will be available in the near future. Part III analyzes the ethical and legal implications of this movement towards autonomous driving and outlines the types of questions that will need to be answered before self-driving cars can be on the road. Finally, Part IV provides recommendations on steps our legal system needs to take to begin addressing many of the issues in this newly developing field.

II. BACKGROUND

A. The Beginnings of Autonomous Driving

Today, there are many features that automakers have installed in their vehicles that are the building blocks for autonomous cars. The combination of multiple features basically creates the experience of the car driving itself. For example, Cadillac's super cruise system engages the vehicle's large array of safety features including adaptive cruise control, lane keep assist, and multiple sensors to allow the driver to remove his hands from the steering wheel in limited access freeways.² Additionally, the system requires the driver to be on a highway and remain focused and looking at the road ahead.³ If the driver loses focus, the system automatically notifies the driver, and if he remains unresponsive,

¹ David Meyer, *Domino's Self-Driving Delivery Quest Rolls On With Ford Test*, FORTUNE (Aug. 29, 2017), <http://fortune.com/2017/08/29/dominos-ford-pizza-self-driving-autonomous/>.

² *Introducing Cadillac Super Cruise™ The World's First True Hands-Free Driving System For The Freeway*, CADILLAC, <http://www.cadillac.com/world-of-cadillac/innovation/super-cruise.html> (last visited Mar. 11, 2018).

³ *Id.*

automatically disengages the system.⁴ In other words, the car can make certain peripheral decisions while the driver maintains control of the vehicle.

Other companies have developed autonomous driving systems they claim are safer than humans driving. Tesla's autopilot system will use the vehicle's eight cameras and twelve sensors to analyze the world around it and drive the car completely autonomously.⁵ While the system appears promising, it has not been without controversy. In 2017, Tesla owners sued the company claiming that the system led cars to drive erratically and behave in an unstable manner.⁶ Although the lawsuit did not claim any serious personal injuries to others as a result of autopilot, one of the issues with systems like this would be determining who is at fault in those situations.

B. The Future of Autonomous Driving

Many individuals may welcome the idea of being able to take their hands completely off the wheel from their long commutes, but companies are equally invested in this endeavor as well. Ford has partnerships with companies like Lyft, Dominos, and Postmates to use autonomous vehicles for their services.⁷ These partnerships include plans for Lyft to use autonomous vehicles to pick-up customers and drive to their locations automatically.⁸ Furthermore, Ford states, “[i]n the future, when a consumer uses Postmates to place a purchase—whether for groceries, takeout or other goods—a self-driving vehicle could be what delivers her order.”⁹

⁴ *Id.*

⁵ *Full Self-Driving Hardware on All Cars*, TESLA, <https://www.tesla.com/autopilot> (last visited Mar. 11, 2018).

⁶ Chris Woodyard, *Tesla's Autopilot Self-Driving System Slammed in Lawsuit*, USA TODAY (Apr. 19, 2017, 7:03 p.m.), <https://www.usatoday.com/story/money/cars/2017/04/19/teslas-autopilot-self-driving-system-slammed-lawsuit/100670104/>.

⁷ Andrew Hawkins, *Ford Wants to be the Self-Driving OS for the Future of Transportation*, THE VERGE (Jan. 9, 2018, 12:40 p.m.), <https://www.theverge.com/2018/1/9/16868814/ford-self-driving-autonomous-vehicles-2018>.

⁸ *Id.*

⁹ *Id.*

Ford is not the only company partnering with others to launch autonomous vehicles. Toyota has recently announced its own autonomous vehicle, store-like concept, the e-Palette, and has already secured partnerships with Amazon, Pizza Hut, Uber, and DiDi.¹⁰ The vehicle will debut during the 2020 Olympic games.¹¹

Auto manufacturers are not the only industry developing autonomous vehicle technology. Computer chipmaker Nvidia is also producing chips to run neural networks in autonomous vehicles for Uber and will produce additional chips for Volkswagen to use in its new products.¹² This is a significant development in the automobile industry because it illustrates how a field once dominated by car manufacturers is now working with technology companies to secure the future of autonomous vehicles.

The automobile and service industries that depend on cars are clearly moving towards an autonomous driving future. The recent developments by large technology companies and automakers are precursors of what is coming in the near future. Sooner rather than later we may be stepping into a world where our pizzas are delivered by an autonomous vehicle, and we will be purchasing cars that can drive us without any input from the driver. A question that remains unanswered is how this rapidly developing field will be regulated and the ethical issues that arise from many of these advancements.

III. ANALYSIS

A. The Ethical Questions of Autonomous Vehicles

There are various ethical quandaries surrounding the adaptation of autonomous vehicles on the roads. The legal status of autonomous vehicles is still murky in some states, and neither the National Highway Traffic Safety Administration (NHTSA) nor the Federal Motor Vehicle Safety Standards

¹⁰ Chloe Aiello, *Toyota Shows Off its Futuristic Self-Driving Store, the 'e-Palette,' at CES*, CNBC (Jan. 8, 2018, 3:13 p.m.), <https://www.cnbc.com/2018/01/08/toyota-unveils-e-palette-at-ces.html>.

¹¹ *Id.*

¹² Moneywatch, *Nvidia Chips to Power Uber's Self-Driving Fleet, VW Vehicles*, CBSNEWS (Jan. 8, 2018), <https://www.cbsnews.com/news/nvidia-chips-to-power-ubers-self-driving-fleet-vw-vehicles/>.

(FMVSS) expressly prohibits them.¹³ The U.S. Department of Transportation (USDOT) is partnering with states “and transportation stakeholders to encourage the safe development, testing and deployment of automated vehicle technology.”¹⁴ Therefore, it can be assumed that these self-driving cars would be permissible on our roads under federal regulations.

Despite not having a federal legal issue for operations, our laws remain ill-equipped to answer many of the ethical issues of autonomous vehicles.¹⁵ Humans are forced to make many decisions while on the road including whether it is safe to change lanes or change speed in different terrain. These are elements that can likely be programmed into a car without much difficulty.

The issues arise with specific situations drivers may not typically encounter but nonetheless do occur. For example, “if an animal darts in front of our moving car, we need to decide: whether it would be prudent to brake; if so, how hard to brake; whether to continue straight or swerve to the left or right; and so on.”¹⁶ However, those same human instincts would now need to be programmed into an autonomous vehicle that could replicate those decisions.¹⁷

The harsh reality is,

[h]uman drivers may be forgiven for making an instinctive but nonetheless bad split-second decision, such as swerving into incoming traffic rather than the other way into a field. But programmers and designers of automated cars don’t have that luxury, since they *do* have the time to get it right and therefore bear more responsibility for bad outcomes.¹⁸

While it is theoretically possible to program the correct decision, the question of the consequences of the liability for a wrong decision is still undetermined. If a driver in an autonomous vehicle hits a pedestrian on the road

¹³ Bryant Walker Smith, *Automated Vehicles Are Probably Legal in the United States*, 1 TEX. A&M L. REV. 411, 458 (2014).

¹⁴ *USDOT Automated Vehicles Activities* U.S. DEP’T OF TRANSP. (Feb. 23, 2018), <https://www.transportation.gov/AV>.

¹⁵ Patrick Lin, *The Ethics of Autonomous Cars*, THE ATLANTIC (Oct. 8, 2013), <https://www.theatlantic.com/technology/archive/2013/10/the-ethics-of-autonomous-cars/280360/>.

¹⁶ *Id.*

¹⁷ *Id.*

¹⁸ *Id.*

because of a mistake in the car's programming or function, is the driver liable for the injury? This question remains unanswered and there are arguments to be made on either side. Due to this ethical difficulty, it is imperative to have a system of laws and regulations in place that can resolve these types of questions.

B. The Laws and Regulations of Autonomous Cars

Some states have moved to fill-in the gaps caused by the limited federal involvement in autonomous vehicle regulation. In 2011, Nevada became the first state to recognize autonomous cars.¹⁹ The legislation also specifies the minimum safety regulations, requiring “[a] consumer vehicle must additionally be ‘capable of being operated in compliance with the applicable traffic laws,’” and additional licensing requirements necessary to operate a self-driving car.²⁰ In Florida, the state defined “autonomous vehicle” and issued a number of regulatory requirements for self-driving cars in the state.²¹ In California, the state passed legislation defining autonomous vehicles and introduced a number of safety requirements for testing and operating these cars.²² Other states appear to be following the course of the first three early adopters of autonomous vehicle regulations.

However, a number of legal issues remain unresolved. Aside from the actual requirements of licensing and safety of vehicle production, there is little information on what to do in situations of accidents or whenever the technology in an autonomous vehicle may fail. “[M]any of the regulations concerning today's vehicles assume that a human is driving the vehicle.”²³ Of course, the objective of a completely autonomous vehicle is to remove the human element that may cause the accident in the first place. However, there is very little, if any, guidance as to who is potentially liable when there is an accident.

¹⁹ Smith, *supra* note 13, at 501.

²⁰ *Id.* at 501, 503.

²¹ *Id.* at 506.

²² *Id.* at 507.

²³ Julie Goodrich, *Driving Miss Daisy: An Autonomous Chauffeur System*, 51 HOUS. L. REV. 265, 279 (2013).

In cases of civil liability where the driver is at fault tort law applies.²⁴ However, it is unclear if the driver is at fault for an autonomous vehicle in an accident.

The potential parties that could be at fault include: the operator (defined differently in the three states which have currently enacted legislation), the vehicle manufacturer (the manufacturer of the original nonautonomous vehicle), the automator (the modifier of the original vehicle into an autonomous vehicle or the creator of an autonomous vehicle from scratch), and the programmer (the person responsible for creating and coding the autonomous software).²⁵

Some believe the automator should be held liable and products liability theory should apply.²⁶

In criminal cases, similar uncertainty remains. If an autonomous vehicle violates a traffic law, it is unclear whether the operator or the vehicle either the programmer or automator should be held liable for the violation.²⁷ “For strict liability offenses, such as speeding or failing to use a turn signal, Nevada law seems to hold the operator, and not the automator, liable.”²⁸ While this is a standard Nevada applies, this is an issue every state needs to address with autonomous vehicles. The possibility of a third-party hacking a vehicle and causing it to break traffic laws is another area that has yet to be addressed by our current criminal codes.²⁹

Though limited in scope, the federal government has issued recommendations for states to follow when making laws for autonomous vehicles and rules to govern manufacturers development of these cars.³⁰ In 2016, the Obama Administration’s USDOT issued a report outlining its plan for autonomous vehicles.³¹ The plan laid out a set of guidelines for testing and

²⁴ *Id.* at 280.

²⁵ *Id.*

²⁶ *Id.*

²⁷ *Id.* at 281.

²⁸ *Id.* at 281-82.

²⁹ *Id.* at 282-83.

³⁰ BILL CANIS, CONG. RESEARCH SERV., R44940, ISSUES IN AUTONOMOUS VEHICLE DEPLOYMENT, 5 (2017).

³¹ *Id.* at 4.

producing autonomous vehicles, model state policies, a streamlined review process in the DOT to expedite autonomous vehicle production, and identified new tools and regulatory structures for NHTSA to promote autonomous vehicle production.³² These rules, however, merely stated certain obvious regulations that automakers would have to comply with. For example, some guidelines urged manufactures “to ensure that their test vehicles meet applicable NHTSA safety standards and that their vehicles be tested through simulation, on test tracks, or on actual roadways.”³³

In September 2017, the Trump Administration made changes to USDOT’s policies on autonomous vehicles.³⁴ “The new voluntary guidance, Automated Driving Systems 2.0: A Vision for Safety, clarifies for manufacturers, service providers, and states some of the issues raised in the Obama Administration’s predecessor report and replaces some parts of the earlier guidance; the new policy recommendations took effect immediately.”³⁵ The guidelines loosen restrictions for manufacturers. Under the 2016 requirements, manufacturers had to submit safety assessments that have now been made voluntary.³⁶ Additionally, the language stating that certain NHTSA rules may become mandatory have been replaced with language stating “assessments are not subject to federal approval.”³⁷ The recommendations for considerations of privacy, ethics, and registration have also been removed.³⁸ Finally, “[US]DOT notes that it is not necessary that all state laws with regard to autonomous vehicles be uniform, but rather that they ‘promote innovation and the swift, widespread, safe integration of ADSs.’”³⁹

The federal government is interested in promoting the development of autonomous vehicles, but there remain many legal questions that need to be resolved as this process continues. Our current legal system appears unprepared to handle a future with autonomous vehicles. The lack of a coherent set of rules to

³² *Id.*

³³ *Id.*

³⁴ *Id.* at 6.

³⁵ *Id.*

³⁶ *Id.*

³⁷ *Id.* at 7.

³⁸ *Id.* at 6.

³⁹ *Id.* at 7.

govern self-driving cars is an issue that state and federal legislators need to address. The level of safety and security in these vehicles are greater than those of traditional cars. Issues of liability varying between states may be troublesome. Though autonomous driving may seem like something that will come in a distant future, the reality is that automakers like Ford, Cadillac, and Tesla have already launched or will be launching autonomous vehicles in the near future.

IV. RECOMMENDATIONS

Legislators are in a difficult situation when it comes to regulating autonomous vehicles in trying to find the balance between rules that promote road safety and clarify aforementioned legal issues, while promoting the advancement and development of self-driving cars. One suggestion to ameliorate this issue is to provide legal immunity to automators in a similar way to how the National Childhood Vaccination Injury Act of 1986 (NCVI) does for vaccine manufacturers when a patient suffers an injury.⁴⁰ In order to allow injured parties to seek relief, regulators can create a court similar to the Vaccine Court created under the NCVI.⁴¹ The Vaccine Court has effectively managed to protect vaccine manufacturers and encourage vaccine production, while providing those that suffered harm a means of recovery.⁴² This form of regulation would definitely ease concerns that automators may have, while still encouraging development of a technology that can improve safety and providing consumers a means of recovery in cases of accidents.

Challenging questions of how to program an autonomous vehicle remain. Should a self-driving car stop to protect the driver in the car from an accident ahead at the expense of a driver that may be behind a car suffering an injury? Ethical questions such as this need to be addressed sooner rather than later. First, despite the introduction of autonomous vehicles, there will be a significant amount of time that will elapse before these vehicles will be the only vehicles on

⁴⁰ Goodrich, *supra* note 23, at 284.

⁴¹ *Id.*

⁴² Jennifer Keelan & Kumanan Wilson, *Balancing Vaccine Science and National Policy Objectives: Lessons From the National Vaccine Injury Compensation Program Omnibus Autism Proceedings*, 101 AM. J. PUB. HEALTH 2016 (2011).

the road. Therefore, regulations must address the way an autonomous vehicle interacts with a car driven by a human. A potential solution is to regulate automated driving technologies in a similar fashion to federal rules on airbags and other safety features to ensure that all cars equipped with autonomous driving technology meet the same safety standards.

In order to address these concerns, legislators should take various steps to promote development of autonomous vehicles, while ensuring the safety of consumers. First, “interested entities within industry, academia, and government need to work together, especially when addressing interdisciplinary topics in an emerging field.”⁴³ While autonomous vehicles are being rapidly developed and introduced into the market, cooperation between stakeholders and business leaders that can help address some of the ethical and legal questions surrounding self-driving cars is necessary to ensure that comprehensive and sensible regulations are introduced. Additionally, federal and state government partnerships will be helpful in creating uniform safety rules that address issues states may have with registration and licensing of these vehicles with concerns over safety.

In September of 2017, the U.S. House of Representatives passed H.R. 3388, bipartisan legislation to address several issues concerning autonomous vehicles.⁴⁴ The bill included provisions limiting states from regulating designs of autonomous vehicles, but most importantly it required the USDOT to issue a final rule to manufacturers addressing the safety of autonomous cars.⁴⁵ The legislation also required a cybersecurity plan to help prevent hacking into autonomous vehicles.⁴⁶ The bill also requires USDOT to issue a rule to requiring manufacturers to explain the capacities and limitations of an autonomous vehicle.⁴⁷

⁴³ Dr. Sven A. Beiker, *Legal Aspects of Autonomous Driving*, 52 SANTA CLARA L. REV. 1145, 1153 (2012).

⁴⁴ CANIS, *supra* note 30.

⁴⁵ *Id.* at 12.

⁴⁶ *Id.*

⁴⁷ *Id.* at 13.

This legislation has been met with resistance from state and local government associations and vehicle safety advocacy groups that argue that it is an overreach of federal government involvement and encroaches on states' rights to regulate vehicles.⁴⁸ However, vehicle safety advocacy groups argue the legislation does not go far enough. They believe the legislation allows too many loopholes for vehicles that do not meet safety criteria to be on the road, and the data collected from vehicle tests should be shared publicly.⁴⁹ Transportation for America believes the legislation was not developed properly because interested stakeholders were not consulted and that it would allow too many experimental vehicles on the road.⁵⁰ Both sides of this argument have valid points. But given that this is a rapidly growing field and that our current laws are not apt to address many of the concerns with autonomous vehicles it is a good place to start.

Another issue with this bill is that it does not address specific ethical issues that have been mentioned in this note. This is an area that will require cooperation with multiple groups. Language creating partnerships with stakeholders in the field can help address these concerns and begin to tackle some of the additional legal and ethical issues that remain to be addressed. This bill passed the House and is currently in the Senate.

V. CONCLUSION

Autonomous vehicles have a lot to offer in terms of safety and comfort for drivers. However, as we speed to a future with self-driving cars we find many legal and ethical questions that have yet to be addressed. A balance between protections for manufacturers to continue the development of autonomous vehicle and providing consumers an avenue for recovery is a potential legislative solution that has worked in the past. A cooperation between stakeholders, legislators, and businesses is necessary to resolve the ethical questions and liability issues that remain. Any legislation that can provide manufacturers, automators, and consumers guidelines for developing autonomous vehicles will be a useful first

⁴⁸ *Id.*

⁴⁹ *Id.*

⁵⁰ *Id.*

step in this process. Just as regulators introduced policies governing airbags, seatbelts, and headlights, so too must they begin to address self-driving cars.