WHEN ROBOTS ATTACK:
HOW SHOULD THE LAW HANDLE SELF-DRIVING CARS THAT CAUSE DAMAGES

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I. INTRODUCTION

In 1943, Seagram’s Canadian whiskey launched an ad campaign that predicted the technologies of tomorrow.1 At the time, many of these predictions were seemingly extremely bold and unlikely. They thought the

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world would have an airport on the North Pole,\(^2\) that houses and offices would automatically rotate to keep the sun shining in certain places,\(^3\) and commercial airplanes would travel outside of the Earth’s stratosphere.\(^4\) However, they also made some predictions were perfectly accurate. They predicted everyone would have wireless telephones that could call home wherever and whenever the owner wanted,\(^5\) flights half way across the world could take less than half a day,\(^6\) machines could dictate words as they are spoken,\(^7\) color televisions would be the norm and available at every restaurant,\(^8\) and cars could safely drive 100 miles per hour on land.\(^9\) Despite the accuracy of some of these predictions, no one guessed it would be possible to have cars that completely drive themselves.

Welcome to the future! We are a mere five years away from autonomous vehicles being in production, sold to consumers, and street legal, according to a promise made by Nissan in 2013.\(^10\) Further, others speculate that autonomous vehicles will become mainstream products within thirteen years and in production within five years.\(^11\) Once autonomous vehicles become available they will be a vital part of everyday technology.

Elon Musk, co-founder of Tesla, believes that cars that need to be driven by humans could be outlawed within twenty years.\(^12\) Musk believes that having humans driving “two-ton death machines” is too dangerous when there are computers and robots that can do a much better job.\(^13\) Humans will become a statistical liability on roadways, according to Musk.\(^14\) Some believe driver’s licenses will no longer exist by 2040.\(^15\)

The impact of the autonomous vehicle on society may have an analogous impact to that of cell phones approximately three decades ago. Cell phones were first sold to consumers in 1983.\(^16\) By 1990, there were one million cell

\(^2\) See id. (referring to an advertisement that predicted futuristic technologies from 1943).
\(^3\) Id.
\(^4\) Id.
\(^5\) Id.
\(^6\) Id.
\(^7\) Id.
\(^8\) Id.
\(^9\) Id.
\(^11\) See Michael Vaughan, Self-Driving Cars on the Road to Reality, GLOBE & MAIL (Jan. 3, 2013), at D7 (explaining that autonomous vehicle technology is practically ready but as yet unavailable because it is not legal); see also id. (stating that autonomous vehicles will be in production by the year 2020); see also Julie Goodrich, Comment, Driving Miss Daisy: An Autonomous Chauffeur System, 51 Hous. L. Rev. 265, 293 (2013) (concluding that consumer autonomous vehicles will be on the market within fifteen years of the date of this Comments publication).
\(^13\) Id.
\(^14\) Id.
\(^15\) Doug Newcomb, You Won’t Need a Driver’s License by 2040, WIRED (Sept. 17, 2012, 1:42 PM), http://www.wired.com/autopia/2012/09/see-autonomous-2040 (arguing that full deployment of autonomous vehicles could lead to the elimination of driver’s licenses, traffic signs, and traffic lights).
\(^16\) Adrian Lee, 40 Years of the Mobile Phone: Top 20 Facts, EXPRESS (Apr. 3, 2013, 7:43 AM),
phone users. Today, there are an estimated five billion mobile devices worldwide. If autonomous vehicles prove to be as useful as mobile devices, their impact on society could be even more significant.

A lot of work still needs to be done by the innovators of self-driving cars from both a scientific and policy standpoint. Today, virtually every major automaker, and even some companies not known for automobile production, are working on some form of autonomous vehicle or self-driving technology. For instance, companies like Nissan and Tesla, which are known for being automobile innovators, have several successful products in the works that involve some form of autonomous vehicles. Tesla claims to have a car ready for production that is ninety percent capable of autopilot.

Even companies that are not known for producing automobiles are getting involved with creating self-driving cars. Uber, the ride-sharing smartphone application, passive voice partner with Carnegie Mellon University to create a self-driving car. Uber plans to make getting around cities even cheaper than it currently is. Uber CEO Travis Kalanick said that “[w]hen there’s no other dude in the car, the cost of taking an Uber anywhere becomes cheaper than owning a vehicle.” Although Uber thinks this will be a multi-decade transition, the potential for saving Uber users money and time could be significant if autonomous vehicles ultimately were to replace the current taxi system.

What has surprised many in the industry is that the company that has established itself as the leader in the race to develop a fully safe street autonomous vehicle is Google, the company originally known for its online search engine. Google has been testing autonomous vehicles on public roads across various parts of the country with great success for several years now. The technology is nearly mastered by several of the leaders in this field, but it is still unclear how the law will handle this new technology.

This Note seeks to examine how civil liability will attach to the inevitable accidents that will occur from autonomous vehicles. Part II of this Note will discuss the history, need, safety, and actual benefit of autonomous vehicles in


17. Id.
18. Id.
21. Id.
22. Lowensohn, supra note 12.
23. Id.
25. Id.
26. Id.
27. Id.
28. Id.
30. Sebastian Thrun, What We’re Driving At, GOOGLE OFFICIAL BLOG (Oct. 9, 2010), http://www.googleblog.blogspot.com/2010/10/what-were-driving-at.html.
our society and world. Part III of this Note will then explore the potential liability schemes for accidents involving autonomous vehicles that different states can adopt. Part IV of this Note will argue that there is enough precedential law to support autonomous vehicle liability and that the law should treat autonomous vehicles like other autonomous machines, not traditional automobiles. Thus, this Note proposes that the law should adopt policies aligned with either elevators, or airplane or boat autopilot that makes manufacturers of autonomous vehicles strictly liable for any malfunction or accident caused by their product as long as there is no negligence by the user.

II. BACKGROUND

A. Automobile Safety

From 2005 to 2015, the amount of fatal accidents from motor vehicle crashes in the United States decreased every single year but once.\textsuperscript{31} Even though recent years have been the safest over the past several decades, over 30,000 people per year in the United States still die from traffic-related incidents.\textsuperscript{32} Additionally, China and India, the countries with the most people in the world, combined to have 500,000 traffic-related deaths per year.\textsuperscript{33} Around the world over 1.2 million people every year die from traffic-related incidents.\textsuperscript{34}

The amount of traffic-related fatalities has been declining in some high-income countries, but globally, traffic-related fatalities have increased, remaining a common cause of death.\textsuperscript{35} In fact, in 2002, the second most common cause of death worldwide for people aged 5–29 were traffic-related.\textsuperscript{36} For people aged 30–44, traffic-related accidents were the third most common cause of death.\textsuperscript{37} In the United States, approximately 95% of traffic-related deaths were caused by driver error.\textsuperscript{38} Of that 95%, about 40% is recognition errors, about 35% is decision errors, and about 10% is performance error.\textsuperscript{39}

\textsuperscript{32} Id.
\textsuperscript{34} Id.
\textsuperscript{35} Id.
\textsuperscript{37} Id.
\textsuperscript{39} Id. Recognition error includes: inadequate surveillance, internal distraction, external distraction, inattention, and other/unknown recognition error. Decision error includes: too fast for conditions, too fast for curve, false assumption of other’s action, illegal maneuver, misjudgment of gap or other’s speed, following too closely, aggressive driving behavior, and other/unknown decision error. Performance error includes: overcompensation, poor directional control, other/unknown performance error, and panic/freezing.
The remainder is other/unknown driver error.\(^{40}\)

While those numbers are alarming, traffic deaths in the United States have mostly been subsiding.\(^{41}\) Deaths from traffic-related incidents peaked in the 1970s.\(^{42}\) In 1971, there were approximately 55,000 traffic-related deaths.\(^{43}\) There has been a steady decline since then.\(^{44}\) The numbers continue to suggest improved driving conditions.\(^{45}\) Even though more people are driving today, there are fewer total fatalities and consequently fewer fatalities per mile driven.\(^{46}\) Despite the clearly improved conditions, traffic-related fatalities remain a risk for all people on the roads.\(^{47}\)

Car companies are not ignoring the risks associated with driving.\(^{48}\) Safety is among their biggest concerns.\(^{49}\) In 2013, there was an estimated $102 billion spent on research and development for the auto industry alone.\(^{50}\) Additionally, car manufacturers have made several major safety changes that have saved a significant amount of lives—most notably being the seat belt and the air bag.\(^{51}\) The National Highway Traffic Safety Administration estimated that from 1975–2001, air bags have saved 8,369 lives, while seat belts have saved 147,246 lives.\(^{52}\) While these numbers are cause for optimism regarding the trend of safety in automobiles in the United States, over one million people still died from car accidents from 1975–2001.\(^{53}\) Ultimately, seat belts and air bags have failed to make most potentially fatal car accidents non-fatal.\(^{54}\)

### B. Perception of the Safety of Autonomous Vehicles

Generally, people will not buy products that they do not believe are safe to use, no matter how convenient the use of the product might be. For example, the technology to build skyscrapers was around long before they...
were commonly built. Despite their ability to do so, engineers knew that before they could start constructing skyscrapers, they first needed to find a safe way to move vertically throughout the tall buildings before people would be comfortable living and working in them. The technology to have skyscrapers existed, but it was not worth risking lives to have taller buildings until people felt safe going up and down them.

Furthermore, it is not enough that new products and technologies are actually safe; they must also have the perception of safety among potential consumers before people feel comfortable enough to use them. Imagine trying to be one of the first people to go into a large box that suddenly and effortlessly rises 100 feet in the air. Before anyone would be comfortable getting into that box, she would likely need reassurances of its safety through many test runs and other people successfully using it. She might feel even more comfortable if the manufacturer included a guarantee and assumed liability for any incidents as a result.

In 1853, Elisha Graves Otis, the inventor of an elevator rope-brake safety device, knew that he needed to prove his product was safe. He understood that just telling people it was safe was not going to be enough to overcome their skepticism, so Otis decided to purposely cut the rope of an elevator he was in and allow his invention to save his life. This dramatic presentation was vital to changing the popular opinion of elevator safety and enabled elevators to ultimately become mainstream products. He made the ultimate risk by showing the utmost confidence in his product. As a result, it paved the way for skyscrapers and urban development, as it is now known.

The once seemingly magical elevators are now considered extremely safe. Very few people have fears of using elevators. If there are any elevator-related incidents that result in damages, the manufacturers are held to the highest standard of care.

Today, autonomous vehicles are beginning to go through a similar dilemma. The technology for self-driving cars is nearly perfected. There are

57. Id.
58. Id.
61. Id.
62. Id.
63. Id.
64. Id.
65. Id.
66. Id.
67. Id.
69. Willoughby, 87 S.W.3d at 512; LeValley, supra note 68, at 11.
70. Chris Urmson, The Latest Chapter for the Self-Driving Car: Mastering City Street Driving,
constantly autonomous vehicles on the road somewhere in the country, even though they are only being used for testing purposes.\footnote{Thrun, supra note 30.}

The technological advancement that these cars are going through is simply stunning.\footnote{Alex Davies, This is Big: A Robo-Car Just Drove Across the Country, WIRED (Apr. 3, 2015, 7:00 AM), http://www.wired.com/2015/04/delphi-autonomous-car-cross-country/.} In 2004 the most advanced self-driving car went 7.32 miles before it got stuck and caught fire.\footnote{Davies, supra note 72.} In 2005, five vehicles completed a 132-mile course in seven hours.

In 2010, Google announced that its self-driving cars had logged over 140,000 miles on public roads without a single accident.\footnote{Chris Urmson, The Self-Driving Cars Logs More Miles on New Wheels, GOOGLE OFFICIAL BLOG (Aug. 7, 2012), http://googleblog.blogspot.com/2012/08/the-self-driving-car-logs-more-miles-on.html.} By 2012, the number of accident-free miles had risen to 300,000.\footnote{Urmson, Latest Chapter, supra note 70.} By April of 2014, Google had logged over 700,000 safe miles,\footnote{Id.} and by May of 2015, Google had logged nearly a million miles on the road and adds approximately 10,000 more miles per week.\footnote{Urmson, Latest Chapter, supra note 70.} In total, Google’s self-driving cars have logged the equivalent of about seventy-five years of typical American adult driving experience.\footnote{Id.}

Despite this excellent record of safety, Google still requires two trained experts in these cars at all times with a removable steering wheel, accelerator pedal, and brake pedal that allow the experts to take over driving if needed.\footnote{Id.} They also tell police where they are going and when they will be there.\footnote{Id.}

Delphi, another technology company that is working on bringing self-driving cars to the market as soon as possible, took a nine-day 3,400-mile trip across fifteen states from California to New York with their technology inside of an Audi automobile.\footnote{See generally Wayne Murphy, Delphi’s Self-Driving Car to Travel 3500 Miles From California to New York, THE NEXT DIGIT (Mar. 22, 2015), http://thenextdigit.com/19114/delphis-self-driving-car-travel-3500-miles-california-new-york/ (explaining the trip Delphi’s self-driving car was going to embark upon); Davies, supra note 72 (discussing the self-driving car’s journey).} Ninety-nine percent of the driving was done on its own.\footnote{Davies, supra note 72.} A human only aided when the car was leaving the highway and driving on city streets.\footnote{Davies, supra note 72.} The car outperformed expectations, flawlessly navigating through rain, hot weather, construction zones, and tunnels.\footnote{Id.} In responding to this news, WIRED Transportation Journalist Alex Davies said, “The news here isn’t that this was possible, but that it was so easy.”\footnote{Id.}
The self-driving programs that Tesla is working on “can identify people, road signs, and other objects, with the promise of learning behavior over time.”\textsuperscript{87} It can also process images from the dozen cameras all around the vehicle.\textsuperscript{88}

In 2013, the non-profit Eno Center for Transportation released a study on how impactful autonomous vehicles will be.\textsuperscript{89} They predicted that if 10% of the cars on the road in the United States were autonomous vehicles, 1,100 lives would be saved per year, there would be 211,000 fewer automobiles crashes per year, and freeway congestion would decrease by 5%.\textsuperscript{90} If 50% of the cars on the road in the United States were autonomous vehicles, 9,600 lives would be saved per year, there would be 1,880,000 fewer crashes per year, and freeway congestion would decrease by 10%.\textsuperscript{91} If 90% of the cars on the road in the United States were autonomous vehicles, 21,700 lives would be saved per year, there would be 4,220,000 fewer crashes per year, and freeway congestion would decrease by 15%.\textsuperscript{92} They also predicted significant fuel savings, a decrease in the frequency of new car purchases, and fewer vehicles on the roads.\textsuperscript{93} Some estimates believe that motor vehicle fatality rates could be as low as those seen in aviation and rail—which is about 1% of the current rates.\textsuperscript{94}

Despite studies coming out strongly encouraging the safety potential of autonomous vehicles, like skyscrapers and elevators before, there still remains doubt on the safety and practicality of these new products.\textsuperscript{95} As little as twenty years ago, the idea of self-driving cars seemed as magical as an elevator seemed 200 years ago.

One of the safety concerns for autonomous vehicles stems from the fact that there are some things that humans do all the time while driving that are hard to account for in autonomous vehicles. In 2012, Google admitted that it was struggling with snow covered roadways, interpreting temporary construction signals, and handling other situations that many drivers encounter.\textsuperscript{96} Additionally, some things that humans are able to easily detect are a struggle for autonomous vehicles.\textsuperscript{97} For instance, a person in a roadway may be small or large, standing, walking, sitting, lying down, riding a bike, and/or partly obscured.\textsuperscript{98} Poor weather, snow, fog, and reflective road surfaces...
from rain and ice create other challenges for sensors and driving operations.\textsuperscript{99} The autonomous vehicles may also struggle with determining whether something like a cardboard box or a concrete block is in the road.\textsuperscript{100} There are going to be situations where accidents are unavoidable, but where damages can be mitigated. It is unclear that the autonomous vehicles can make the right decision better than a human in these scenarios.\textsuperscript{101} The manufacturers of autonomous vehicles are constantly improving in these areas but have admittedly not perfected them.\textsuperscript{102}

Additionally, there is still concern about the safety of autonomous vehicles since the majority of the studies on them are merely predictions.\textsuperscript{103} Until autonomous vehicles have truly been integrated into traffic streams, it is difficult to accurately predict what type of outcome they will really have on society.\textsuperscript{104} Since there is limited data that is not just an estimate, it is tough for policy makers and transportation planners to account for the safety concerns of these automobiles in the future.

Furthermore, Google and other autonomous vehicle manufacturers have not demonstrated the utmost confidence in their products like Elisha Graves Otis did.\textsuperscript{105} Otis was willing to risk his life to show how confident he was in his elevator rope-brake safety device.\textsuperscript{106} Autonomous vehicles may struggle with becoming everyday products until the manufacturers can demonstrate that much confidence in their product.

C.  
Efficient Purchase for Consumers

Additionally, the autonomous vehicle industry will need to demonstrate demand for their product and at a reasonable price—which they have yet to accomplish.\textsuperscript{107} Recent estimates place the cost of making autonomous vehicles at about $320,000,\textsuperscript{108} but experts anticipate that despite their current high manufacturing cost, they will not always be only for the exceptionally rich.\textsuperscript{109} For example, NVIDIA, another leader in the self-driving car technology industry, is prepared to start releasing their self-driving kit to developers for just $10,000.\textsuperscript{110} By 2025, some experts estimate that turning a regular car into a self-driving car will only add $7,000 to $10,000 to its previous sticker

\textsuperscript{99} Id. at 5.
\textsuperscript{100} Id. at 4.
\textsuperscript{101} Id.
\textsuperscript{102} \textit{Urmson, supra} note 76.
\textsuperscript{103} See Fagnant & Kockelman, supra note 59, at 15 (explaining that since autonomous vehicles have not yet been immersed into traffic stream it is difficult to reliably predict how this technology will truly impact society).
\textsuperscript{104} Id.
\textsuperscript{105} \textit{MITSUBISHI ELEC. CORP., supra} note 60.
\textsuperscript{106} Id.
\textsuperscript{108} Id.
\textsuperscript{109} Id.
\textsuperscript{110} Lowensohn, supra note 12.
price. But while that number may seem low, it is still an extremely burdensome value when the average American can only afford $20,806 on a car.

Over time, autonomous vehicles are anticipated to become more consumer friendly for the average American. Predictions claim that in approximately twenty years, the technology will become efficient enough that it will only add $3,000 to the previous sticker price. However, for the more immediate future, some experts have predicted that companies like Audi, BMW, and Mercedes-Benz will be the first to successfully sell these cars because of their more affluent clientele.

Meanwhile, companies like Ford are not as anxious to break into the self-driving car markets. Ford does not believe they can enter the market in the most efficient and cost-effective way possible. Ford is still working on creating self-driving cars, but it is looking for a way to make them more accessible to their less affluent clientele than what the other leaders in the industry are doing. Ultimately, the general consensus among the automobile industry is that even Google’s idealistic approach to the self-driving car is not going to be affordable enough to justify mass production of this technology in the near future.

Despite price of the vehicles being an important consideration for many, technological experts like Elon Musk predict that autonomous vehicles could be the only cars that are allowed on the roads in twenty years. Musk has admitted that even if manually driven cars are not completely outlawed in twenty years, there will at least be a “slow sea change in the automotive industry, something that’s already been the case with hybrid and electric vehicles.” Whether or not the law mandates self-driving cars, they will essentially replace regular cars by 2035, according to Musk.

Musk further put the evolution of self-driving vehicles in perspective by explaining that there are approximately two billion vehicles on the roads today. The automotive industry has the ability to produce about one hundred million new vehicles a year. If production rates continue to improve and self-driving cars go into production shortly, Musk believes it will take about twenty years for self-driving cars to be the dominant automotive

111. Tannert, supra note 107.
112. Id.
113. Id.
114. Id.
115. Id.
116. Id.
117. Id.
118. Id.
119. Id.
120. Id.
121. Lowensohn, supra note 12.
122. Id.
123. Id.
124. Id.
125. Id.
mode of transportation.\footnote{126}{Id.} A recent study by IHS gave a more humble prediction on the impact that autonomous cars will have on society in the future.\footnote{127}{Id.} It anticipates that self-driving cars will be about 9%, or 11,800,000 total, of the world’s auto sales, and that there will be a total of 54,000,000 autonomous vehicles on the road by 2035.\footnote{128}{Id.} IHS still believes that by 2050 autonomous vehicles will be over 50% of the vehicles on the roads.\footnote{129}{Id.}

\section*{D. Benefits of Autonomous Vehicles}

The potential benefits of autonomous vehicles are significant and plenty.\footnote{130}{Id.} Proponents of these vehicles believe that traffic congestion will decrease as more and more autonomous vehicles fill the road.\footnote{131}{Id.} There will also be lower fuel consumption.\footnote{132}{Id.} Seniors, disabled individuals, and even drunk or distracted drivers will still be able to get around without risking their own lives and the people around them.\footnote{133}{Id.} Further, autonomous vehicles will give travelers the ability to free up their time and do other work while driving.\footnote{134}{Id.} Ultimately, the technology will transform mobility for millions of people by reducing accidents caused by human error, reclaiming billions of hours wasted in traffic, and bringing everyday destinations and new opportunities to people across the world.\footnote{135}{Id.}

Some proponents of autonomous vehicles believe that removing the human component of driving will make nearly all traffic accidents totally avoidable.\footnote{136}{Id.} This belief is based on the notion that autonomous vehicles will eliminate the human errors associated with speeding, aggressive driving, over-compensation, inexperience, slow reaction times, inattention, and various other driver shortcomings.\footnote{137}{Id.} Additionally, since autonomous vehicles will be able to respond quicker to situations such as cars immediately braking in front of them, they will be able to reduce speed at a more appropriate rate, which will reduce the wear and tear on the car and lead to fuel saving and less brake wear.\footnote{138}{Id.} Autonomous vehicles are also expected to use existing lanes and intersections more efficiently through shorter headways and more efficient

\footnotesize{\textsuperscript{126}Id.} \textsuperscript{127} Tannert, supra note 107. \textsuperscript{128}Id. \textsuperscript{129}Id. \textsuperscript{130}Eisenstein, supra note 10. \textsuperscript{131}Id. \textsuperscript{132}Id. \textsuperscript{133}Id. \textsuperscript{134}Id. \textsuperscript{135}Urmson, Green Lights, supra note 78. \textsuperscript{136}See Danielle Lenth, Chapter 570: Paving the Way for Autonomous Vehicles, 44 McGeorge L. Rev. 787, 792 (2013) (explaining how California’s proposed rules regarding autonomous vehicles can eliminate nearly all traffic accidents). \textsuperscript{137}See FAGNANT & KOCKELMAN, supra note 59, at 3 (listing some of the many reasons that traditional vehicle may crash and where autonomous vehicles will not). \textsuperscript{138}Id. at 4.
route choices.\textsuperscript{139} 

In light of all of the potential pros of autonomous vehicles, it is still not clear that our society needs autonomous vehicles for safety or efficiency purposes. They appear to be unaffordable to most Americans for the near future.\textsuperscript{140} There is no uniform framework for liability, and policy makers are not adapting quickly enough.\textsuperscript{141} Traffic accidents and drunk driving accidents are substantially down.\textsuperscript{142} Many people in urban areas are maximizing public transportation or walking. This information raises the question of whether autonomous vehicles are really that necessary or beneficial.

\section*{E. Current Status of Laws on Autonomous Vehicles}

Despite unclear immediate consumer demand and confidence in this product, many states are beginning to acknowledge its inevitability. The potential of having cars drive themselves opens up a plethora of insurance and liability issues that are unlike anything society has seen before.\textsuperscript{143} Politicians in twenty-seven states and the District of Columbia have at least proposed legislation regarding autonomous vehicles,\textsuperscript{144} but only four states—Nevada, California, Florida, Michigan—have legalized the testing of autonomous vehicles on their roads.\textsuperscript{145} In all the other states, the proposed bills regarding autonomous vehicles have failed, been tabled, or are still currently in committee talks.\textsuperscript{146} To date, no state has made autonomous vehicles street legal for consumers.\textsuperscript{147} 

While there has been a lot of discussion about autonomous vehicles, no laws have been proposed about the liability concerns when these vehicles inevitably cause accidents.\textsuperscript{148} The only liability concerns that have been discussed involve third parties installation of autonomous technology into a car that was not originally intended to use autonomous technology.\textsuperscript{149} 

Furthermore, with the exception of encouraging testing, the federal government has largely been silent on autonomous vehicle laws.\textsuperscript{150} The National Highway Traffic Safety Administration released a fourteen-page statement making recommendations for how states should handle autonomous vehicles, but the statement does not aim to implement any regulations

\begin{footnotesize}
\begin{enumerate}
\item 139. Id.
\item 140. Id. at 10.
\item 141. Id. at 15.
\item 142. 2012 CRASHES OVERVIEW, supra note 31.
\item 143. See Fagnant & Kockelman, supra note 59, at 9–10 (explaining the various barriers that must be overcome before autonomous vehicles can be fully and successfully implemented into society).
\item 145. See Andrew R. Swanson, Comment, “Somebody Grab the Wheel!”: State Autonomous Vehicle Legislation and the Road to a National Regime, 97 MARQ. L. REV. 1085, 1100 (2014).
\item 146. Weiner & Smith, supra note 144.
\item 147. See Swanson, supra note 145.
\item 148. See Swanson, supra note 145, at 1100.
\item 149. Weiner & Smith, supra note 144.
\item 150. Fagnant & Kockelman, supra note 59, at 2.
\end{enumerate}
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themselves. Essentially, the statement recognized that states are qualified to make the most important decisions relevant to this technology themselves, but it still encouraged them not to rush into allowing autonomous vehicles to be sold to the general public. It also encouraged states to require drivers of autonomous vehicles to have a special license to test the vehicles in a way that minimizes potential harm to other people and cars on the roads, and to comply with any other federal laws during testing, plus a few other minor recommendations. 

There are many other issues that are unclear with autonomous vehicles. Drivers are frequently put in situations when they are forced to choose the lesser of two evils. For instance, when a deer jumps in front of a car, the decision of whether to hit the deer or another nearby car has to be made instantly. It is unclear if autonomous vehicles would be able to instantly recognize the difference between a deer and a human, and if so, how the law would treat accidents like these if the autonomous vehicle makes the wrong choice. Furthermore, the autonomous vehicles may be put in situations where they have to decide to try to minimize injuries to the person inside of the car or other people involved in the accident.

Considering that the legislature continues to be slow to respond to autonomous vehicles in any form and that these cars may be on the roads in the near future, the court system must be prepared to handle lawsuits based on this technology.

III. ANALYSIS – CIVIL LIABILITY OPTIONS

Despite autonomous vehicle manufacturers’ confidence that their products are extremely safe, accidents are inevitable. Total autonomous vehicle accidents may become even more likely if and when these machines become mainstream, mass-produced products in our society—even if total car accidents are down. Seeing as autonomous vehicles are such a revolutionary product, it is unclear how the law will handle them. In particular, the courts need to prepare for how they will rule when civil liability questions arise.

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152. Id.
153. Id.
154. Fagnant & Kockelman, supra note 59, at 17.
155. Id. at 12.
156. Id.
157. Id.
158. Id.
159. Eisenstein, supra note 10.
160. Fagnant & Kockelman, supra note 59, at 12.
161. See generally Urmson, Latest Chapter, supra note 70 (describing how manufacturers are improving the algorithms used to control self-driving vehicles on city streets).
162. See Swanson, supra note 145, at 1118 (describing a situation where autonomous vehicles may still be involved in a car accident).
163. Id.
regarding these machines if the legislatures continue to be slow on passing laws on autonomous vehicles.

Three main options present themselves for how the law can handle civil liability issues regarding autonomous vehicles. First, the law can treat them like the precedential law already set with products liability in traditional automobiles. A second option is to ignore other precedential law and treat these machines like a totally new product and create entirely new laws for them. A third option is to treat them like non-automobile products that have other similar features like elevators or autopilot technology.

A. Treat Them Like Regular Automobiles

Generally, “[o]ne engaged in the business of selling or otherwise distributing products who sells or distributes a defective product is subject to liability for harm to persons or property caused by the defect.” The law typically will evaluate if the cause of the accident was (1) a manufacturing defect, (2) a design defect, or (3) driver negligence.

1. Manufacturing Defect

First, a manufacturing defect occurs when the product departs from its intended design. Liability is imposed whether or not the manufacturer’s quality control efforts satisfy standards of reasonableness. This is strict liability in the truest sense. The concept behind this is to encourage manufacturers to have higher investment in product safety than they otherwise would.

For instance, if a screw was not screwed tight enough on an automobile and consequently the brakes do not work appropriately, it would be considered a manufacturing defect. It is not a reflection of a poor design, but rather of a poorly built individual machine. When this happens the manufacturer is strictly liable. This type of defect has become increasingly rare because modern technology continues to make assembly line efficiency and accuracy nearly perfect. Despite the rarity, in certain circumstances, defects of this

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166. LeValley, supra note 68, at 9–12.
168. Watson v. Ford Motor Co., 699 S.E.2d 169, 174 (S.C. 2010); see also Gurney, supra note 165, at 257 (providing further discussion of the three products liability theories).
170. Id. at cmt. a.
171. Id.
172. Id.
173. Id.
nature are still not unheard of due to sheer product volume.\footnote{175}

2. Design Defect

Second, when determining who should be held civilly liable, courts will consider if there is a design defect.\footnote{176} A design defect occurs when the foreseeable risks of harm posed by the product could have been reduced or avoided by the adoption of a reasonable alternative design; the omission of such design renders the product not reasonably safe.\footnote{177} Many factors may be considered when evaluating whether an alternative design is reasonable and if the omission made the product unreasonably safe.\footnote{178} The factors include “the magnitude and probability of the foreseeable risks of harm, the instructions and warnings accompanying the product, and the nature and strength of consumer expectations regarding the product . . .”\footnote{179} Additionally, courts may consider production costs, product longevity, maintenance, and others.\footnote{180} It should be evaluated on a case-by-case basis.\footnote{181} As a result, the courts evaluate a design defect by using several different tests.\footnote{182} The most frequently addressed are the consumer expectations test and the risk-utility test.\footnote{183} While both have advantages and disadvantages, they both require a subjective analysis by the ultimate decision maker.\footnote{184} They also are especially difficult to use when dealing with new technology.\footnote{185}

a. Consumer Expectations Test

The consumer expectations test looks to see if the product reasonably conforms to the expectations of the consumer.\footnote{186} This determination is based on whether “the danger posed by the design is greater than an ordinary consumer would expect when using the product in an intended or reasonably foreseeable manner.”\footnote{187} More specifically, the consumer expectation test, in a purely design defect analysis, does not merely look at foreseeability; it looks at an unreasonably dangerous standard.\footnote{188} For instance, when a person purchases a can opener, the expectations are fairly clear.\footnote{189} Most would expect the can

\footnote{175. \textit{Id.}}
\footnote{176. \textsc{Restatement (Third) of Torts: Products Liability} § 2 (Am. Law Inst. 1998).}
\footnote{177. \textit{Id.}}
\footnote{178. \textit{Id.} at cmt. f.}
\footnote{179. \textit{Id.}}
\footnote{180. \textit{Id.}}
\footnote{181. \textit{Id.}}
\footnote{182. See Funkhouser, \textit{supra} note 174, at 453.}
\footnote{183. \textit{Id.} at 449.}
\footnote{184. \textit{Id.} at 451.}
\footnote{185. \textit{Id.}}
\footnote{186. \textsc{Terrence F. Kiely \\& Bruce L. Ottley, Understanding Products Liability Law} 135 (2006); \textsc{see also} Funkhouser, \textit{supra} note 174, at 456 (discussing further the consumer expectations test).}
\footnote{187. Kiely \& Ottley, \textit{supra} note 186, at 135; \textsc{see also} Funkhouser, \textit{supra} note 174, at 449 (quoting from the same passage in Kiely).}
\footnote{188. \textit{Id.}}
\footnote{189. Jackson v. Gen. Motors Corp., 60 S.W.3d 800, 804 (Tenn. 2001).}
opener to do exactly what its title suggests—open cans.  

Further, this expectation comes with little to no risk of injury to the user and a level of ease and convenience that nearly every adult will be able to open a can with the product.  

On the other hand, the more complex the product, the harder it is to define reasonable consumer expectations.  

For instance, in Jackson v. General Motors Corp., the court held that even for complex products, such as fuel injection engines or air bags, an average consumer has no realistic way to understand how it functions; so the jury must determine the expectations of the ordinary consumer. This remains true even though the jury will only have the evidence from the trial to determine the expectations of fairly complex products.

Under this situation, a jury may hold a manufacturer liable for a complicated product that operated in line with its function, but was not in line with how the jury would reasonably think it should operate.  

It gets even more complicated when evaluating the expectations of an automobile that has thousands of extremely complicated moving parts.

Many car owners are concerned with a long list of things including, but not limited to, style, speed, safety, gas mileage, warranties, or luxury. It is not uncommon for a 16-year-old new driver to be concerned about how many seats the car has while an older driver may prioritize safety or gas mileage. Additionally, car owners may not consider the expectations of parts of the car like the side air bag until it has already been deployed.

Furthermore, this test is exceptionally challenging to use when dealing with new technology. With products that have not been used and cannot be compared to other models, it is nearly impossible to identify reasonable consumer expectations. Since there are no autonomous vehicles currently on the road, and consequently no reasonable alternative design, the consumer expectation test becomes nearly impossible.

As a result of the ongoing challenges of truly defining consumer expectations on complex products and new technologies, many jurisdictions are abandoning the consumer expectations test for the risk-utility test.

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190. Id.
191. See id. (stating that a can opener is a product about which ordinary consumers would have a basis for expectations regarding the safety of it).
192. Funkhouser, supra note 174, at 456.
193. Jackson, 60 S.W.3d at 804–05.
194. Id.
195. Id. at 805–06
196. See also Funkhouser, supra note 174, at 449–50 (discussing the level to which consumers must be able to identify expectations); see generally KIELY & OTTLEY, supra note 186, at 135–36 (discussing use of consumer expectation test in complex products).
199. Id.
200. Fagnant & Kockelman, supra note 59.
201. Funkhouser, supra note 174, at 450.
b. Risk-Utility Test

The risk-utility test focuses on the safety benefits of a proposed design compared to alternative models in the same category.\textsuperscript{202} This test, like the consumer-expectations test, is a test that evaluates whether something is unreasonably dangerous under the totality of the circumstances.\textsuperscript{203} Dean John Wade, the American Law Institute’s Reporter for the Second Restatement, lists seven factors to consider when using the risk-utility test.\textsuperscript{204} Those factors are: (1) the usefulness and desirability of the product; (2) the safety aspects of the product; (3) the availability of a substitute product; (4) the manufacturer’s ability to eliminate the unsafe character of the product while maintaining the necessary functions of the product; (5) the user’s ability to eliminate the unsafe character of the product; (6) the user’s anticipated awareness of the dangers inherent in the product; and (7) the manufacturer’s ability of spreading the loss by setting the price of the product or by carrying liability insurance.\textsuperscript{205} This test is most effective when dealing with established products that create new models on a regular basis since there is more historic data to use in the analysis and a reasonable alternative design.\textsuperscript{206} Consequently, the risk-utility test struggles with new technologies that do not have previous or similar enough models on which to base decisions.\textsuperscript{207}

This test would be especially challenging when evaluating autonomous vehicles because they are extremely new products. It would be unreasonable to say that the expectations of autonomous vehicles are the same as traditional automobiles. A selling point of autonomous vehicles is that they are different from traditional vehicles.\textsuperscript{208} Autonomous vehicles do not require the same level of attention or focus as other automobiles require.\textsuperscript{209} Even though many companies are in the process of designing autonomous vehicles, there is no reasonable way to compare the various product designs of different corporations with such a small sample of public use.\textsuperscript{210}

Both the consumer expectation test and the risk-utility test require a subjective analysis by the decision maker, which would invite inconsistencies amongst courts across the country.\textsuperscript{211} Thus, both of these tests are extremely troublesome for new technologies where the decision makers may not have enough information to make a fully informed decision.\textsuperscript{212}

\textsuperscript{202} Id. at 450–51.
\textsuperscript{203} See id. at 450 (describing the risk utility test as a balance test that weighs various factors).
\textsuperscript{204} Id. at 450.
\textsuperscript{205} Id.
\textsuperscript{206} See generally id. at 450–51 (describing how the risk utility test applies to new technology).
\textsuperscript{207} See id. at 457 (explaining that more manufacturers will make the risk utility test more applicable to autonomous vehicles).
\textsuperscript{208} See Lenth, supra note 136, at 787 (describing differences between “traditional” vehicles and autonomous ones).
\textsuperscript{209} See id. (describing the technology that allows drivers of autonomous vehicles to pay less attention).
\textsuperscript{210} See Eisenstein, supra note 10 (discussing the Nissan Leaf autonomous vehicle being developed).
\textsuperscript{211} Funkhouser, supra note 174, at 446.
\textsuperscript{212} Id. at 451.
3. **Negligent or Reckless Driving**

Third, negligent or reckless driving occurs when the accident is not caused by a failure of the automobile, but instead by wrongdoing of the operator of the vehicle.\(^{213}\) Examples of this are driving on the wrong side of the highway, speeding, or disobeying traffic lights, signs, or signals.\(^{215}\) Driver error is the most common reason that car accidents occur today.\(^{215}\) Approximately 95% of accidents on the roads today are caused by driver error.\(^{216}\)

While most states use their own slightly unique approach, it is widely accepted that when an operator is the proximate cause of an accident with no proof of the car malfunctioning, the operator will be liable.\(^{217}\) For the cars that are on the road today, this system is logically perfect. It places blame on the individual who is clearly most responsible for the accident.

On the other hand, for autonomous vehicles, it is unclear who or what should be considered the actual operator of the vehicle. The product requires next to nothing out of the so-called drivers other than giving the car a destination.\(^{218}\) The individual inside the car is not operating the vehicle; the computer inside the car is.\(^{219}\) Additionally, if it were decided that the manufacturer is the legal operator of an autonomous vehicle, then current negligent driver laws would hold the manufacturer liable for all autonomous vehicle caused accidents.

All autonomous vehicles that are currently being designed have an emergency override switch that will enable drivers to manually take over driving should they feel it is necessary.\(^{220}\) This would likely be in a situation where an accident is about to occur and the driver instinctually takes control in an effort to minimize the damage. The ability of the driver to take control of the vehicle by activating an override necessarily creates the potential for driver negligence as the override forces the driver to operate the car. Thus, a driver could at least in theory be held liable for any negligence that occurred during the override.\(^{221}\) Even if the drivers are able to activate the emergency override when an accident appears to be inevitable, the negligence will have already occurred before the driver can fully take control of the car.\(^{222}\) The cars will always be able to respond faster than the human drivers, which means that the human driver may never be able to prevent the car’s negligence before it...

\(\text{\textsuperscript{213}}\) See Restatement (Second) of Torts § 282 (1965) (defining negligence generally).
\(\text{\textsuperscript{214}}\) See C.T. Drechsler, Annotation, Custom or Practice of Drivers of Motor Vehicles as Affecting Question of Negligence, 77 A.L.R. 2d 1327, *1—*2 (1961).
\(\text{\textsuperscript{216}}\) Id.
\(\text{\textsuperscript{218}}\) Lenth, supra note 136, at 787.
\(\text{\textsuperscript{219}}\) Gurney, supra note 165, at 251.
\(\text{\textsuperscript{220}}\) See Swanson, supra note 145, at 1091 (describing the override function on autonomous vehicles).
\(\text{\textsuperscript{221}}\) Id. at 1110.
\(\text{\textsuperscript{222}}\) Id. at 1115.
already occurs. Thus, negligent or reckless driving by the car owner of an autonomous vehicle is seemingly impossible.

In sum, current automobile liability principles cannot apply to autonomous vehicles. Manufacturing defects do not project to be the reason for autonomous vehicle accidents. Design defect principles cannot be applied to autonomous vehicles because consumer expectations are too unclear and there are not yet any accepted alternative or previous designs on which to base the products. And driver negligence cannot be used because it is near impossible for the car’s owner to act negligently while the car is in autonomous mode.

B. Treat Them Like Completely New Products

While cars have constantly been improving since their invention, there has never been a development in automobile technology that could permanently change the world as significantly as autonomous driving. Essentially, autonomous vehicles are an entirely new technology that ultimately serves the same purpose as traditional cars, namely getting the passenger from point A to point B, except it will never get distracted or drunk and it will always do the right thing.

Another potentially available option for how the law should handle civil liability in accidents caused by autonomous vehicles is to create entirely new laws and precedents by allowing each state to choose how they want to handle them independently. The liability schemes could come judicially or legislatively. Legislative liability schemes are preferable because they are likely to provide more certainty to autonomous technology manufacturers during the research and development stages. Liability schemes for autonomous vehicles that instead result from the compilation of various judicial decisions over time will only develop if courts are forced to deal with issues that arise when the cars are allowed on the road without clear guidance from the law.

Since these cars cannot yet be purchased anywhere in the United

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225. See Funkhouser, supra note 174, at 446 (stating manufacturing defects are an unlikely source of negligence liability with respect to autonomous vehicles).
226. Id. at 451.
227. See Duffy, supra note 224, at 460 (discussing the general lack of control humans will have while occupying autonomous vehicles).
228. See Lenth, supra note 136, at 787 (referring to Senator Alex Padilla’s answer regarding the impact autonomous vehicles).
229. See id. at 792 (offering the proposition that autonomous vehicles are perfect).
230. Gurney, supra note 165, at 277.
231. Id. at 276.
232. Id.
233. Id. at 276–77.
States, each state can begin to create laws that completely control how they become legal and what the consequences for civil liability are on their own terms and time. If the states pass laws that clearly define the expectations for autonomous cars, the new laws will motivate and provide more certainty to autonomous vehicle manufacturers as they continue to develop this technology. The new laws will make the manufacturers more eager to continue to innovate their product in a way that is aligned with the laws.

However, the process for creating new laws is not always simple or quick. With some estimates predicting that autonomous vehicles will be manufactured for the public within five years, the states do not have much time to come up with sufficient policies. Additionally, with serious autonomous vehicle talk going on for many years already, states have still not begun to seriously consider creating civil rules for autonomous vehicles. Of those states, only four of them have legalized testing of autonomous vehicles, and no state has made autonomous vehicles street legal for consumers. Further, no state has even mentioned how this technology will approach civil liability.

Creating an entirely new system for autonomous vehicles could be rushed and flawed as the demand for the product is beginning to increase while the states are not enacting laws in preparation for them. Additionally, with such a revolutionary product, enacting new laws would just be guessing. There is no way to anticipate how the vehicles will be used and what their function will be in the future. Creating an entirely new set of laws for this technology is too proactive and arbitrary since the necessary research is impossible to achieve. Since autonomous vehicles are nearly ready for consumer use, there is not enough time to do the necessary research without delaying technological advancement.

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234. See Swanson, supra note 145, at 1100 (explaining how states are beginning to increase their discussions on how autonomous vehicles should be introduced).
235. See id. (discussing the procedure and scope of proposed legislation on autonomous vehicles).
237. Id.
239. Thrun, supra note 30.
240. See Swanson, supra note 145, at 1100 (describing the process of various states beginning to discuss how the law should reflect autonomous vehicles).
241. Id.
242. Id.
243. Id.
244. Id.
245. Id. at 1146.
246. Id.
248. Id.
249. Swanson, supra note 145 at 1146.
C. **Treat Them Like Similar but Non-Automobile Technologies**

A third option is to use *established* precedential law on similar technologies that are not automobiles. Each state can choose which technology to model their civil liability after, but the two most analogous technologies are elevators and autopilot on airplanes and ships. Essentially, autonomous vehicles are analogous with elevators and autopilot on airplanes and ships. The machine’s controller informs the machine of a destination and the machine automatically and without further human assistance transports to the destination.

1. **Autopilot on Airplanes and Ships**

Similar to what autonomous vehicles claim to be able to do, autopilot in ships and airplanes are capable of handling unpredictable outside conditions such as wind, other boats and planes, or even wildlife. Google has logged many miles with their self-driving vehicles. During these test drives, the cars have successfully navigated jaywalking pedestrians, cars lurching out of hidden driveways, double-parked delivery trucks, and bicyclists who were not following street laws. Their car now even recognizes and responds to the hand signals of a police officer controlling traffic.

The liability scheme that is traditionally used on autopilot for airplanes and ships attaches liability to the manufacturer unless there has been negligence by the user. Historically, the majority of autopilot accidents have been caused by human error of the pilot. Additionally, the majority of autopilot accidents have happened either at the beginning or end of the trip—the time when autopilot in airplanes and ships is discouraged. The liability scheme continues to put blame on the autopilot manufacturer, unless negligence by the user can be proven. For instance, in *In re Korean Airlines Disaster*, the court held Korean Airlines vicariously liable for their pilot’s misuse of the airplane’s autopilot that led to it getting shot down by the USSR in 1983. The manufacturer of the airplane and the autopilot were not responsible for the autopilot being misused to guide the airplane into

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250. See id. at 1091–92 (describing options for transitioning to autonomous vehicles).
251. See LeValley, supra note 68 at 9–12 (summarizing the similarities between autopilot systems in airplanes, ships, and elevators with autopilot systems in autonomous vehicles).
252. Id. at 9.
253. Id.
254. Urmson, Latest Chapter, supra note 70.
255. LeValley, supra note 68, at 10.
256. Urmson, supra note 78.
257. Id.
258. Davies, supra note 72.
259. Waterman & Henshon, supra note 236.
260. Id.
262. *In re Korean Air Lines Disaster*, 932 F.2d 1475, 1499 (D.C. Cir. 1991); LeValley, supra note 68, at 10; Waterman & Henshon, supra note 236.
263. *In re Korean Air Lines Disaster*, 932 F.2d at 1499.
dangerous airspace. 264

Similarly, in Richardson v. Bombardier, Inc., an airplane using autopilot crashed because the plane was carrying an inappropriate and unbalanced amount of supplies. 265 The autopilot in that airplane was not meant to be used with that type of weight and balance. 266

Another example of autopilot being used inappropriately was in 2006 when the captain of the Crown Princess Cruise Ship engaged the ship’s autopilot only one hour after leaving port while still in too shallow of water. 267 When the autopilot began making a sharp turn in the shallow water, a human overrode the controls and overcorrected the wheel, leading to more than 300 people being injured as a result of human error. 268

Opponents of adopting this liability scheme argue that the standard of attention that a pilot of a ship or airplane needs to maintain is not reasonably comparable to that of an autonomous vehicle user. 269 Pilots are trained professionals in their products and are prepared to take control instantly if the autopilot malfunctions. 270 To rebut that argument, at least in the early years of this technology, it is reasonable to impose the expectation on autonomous cars to make sure the owners are using it responsibly. 271 Much like pilots, a special license or training could be required to operate an autonomous vehicle. 272 And, like pilots, if there is reckless or negligent usage of the product, then liability can be attached to the user. 273 Some people may complain that the special license or training for the right to use an autonomous vehicle eliminates the appeal of this product to elderly, disabled, or other individuals that would otherwise struggle with operating an automobile. 274 Unfortunately, this appears to be valid as autonomous vehicles will probably need several years of successful use before they can be confidently and safely used for the elderly or disabled, or even with no humans in the car at all. 275

States that want to adopt liability similar to autopilot principles will be required to assess who is responsible for the accident in light of the strong preference to hold the manufacturer liable unless there is proof of user misuse. 276

264. Id. at 14.
266. Id.
267. Waterman & Henshon, supra note 236.
268. Id.
269. LeValley, supra note 68, at 16.
270. Id.; Waterman & Henshon, supra note 236, at 16.
271. LeValley, supra note 68, at 10.
272. Id.
273. Id.
274. Id. at 9–10.
275. Id. at 10.
276. In re Korean Air Lines Disaster, 932 F.2d 1475, 1499 (D.C. Cir. 1991); LeValley, supra note 68, at 10; Waterman & Henshon, supra note 236.
2. Elevators

Another technology on which states can base their civil liability schemes for accidents caused by autonomous vehicles is elevators. As elevator technology evolved over time, the liability schemes evolved as well. It began as an inflexible negligence standard where the smallest fault of the manufacturer would lead to liability and continued to get more stringent over time. Eventually, the standard for elevator liability became higher than reasonable care. Ultimately, the majority of jurisdictions agree that elevator manufacturers have the highest standard of care for the users of their products. The person inside an elevator at the time of the accident cannot be held liable unless they are exceptionally negligent.

Elevators and autonomous cars have many similarities. They both function on the basic premise of taking the passenger to the desired destination with no other requirements from the user. Furthermore, elevators and cars are two of the most common modes of transportation. Elevators transport roughly 245 million passengers per day in the United States and Canada alone, which is second only to automobile transportation. Elevators used to be considered unsafe and were controlled by humans; today, elevators are considered extremely safe and are almost always entirely autonomous. Additionally, like cars, elevator regulations are governed by states, even though every state has adopted nearly identical industry standards. Not only did society totally assimilate elevators into everyday life, but it was also able to adapt to the novelty of the technology by adopting laws to regulate the industry at the state level that more than adequately deals liability for potential accidents arising from elevators. These comparisons hold especially true since autonomous vehicles manufacturers boast about their safety in a similar way as Elisha Graves Otis did in 1853. Thus, if elevators are any indication, society will be able to embrace and integrate autonomous cars and respond appropriately by implementing standards at the state level that account for potential liability due to accidents involving the vehicles.

Autonomous cars can follow the evolution of elevator liability by beginning with a more standard negligent principle and then evolving to a more stringent and higher standard on the manufacturers over time and as the

279. Stokes v. Saltonstall, 38 U.S. 181 (1839); Willoughby, 87 S.W.3d at 512.
280. 26 AM.JUR. 2d Elevators and Escalators § 22 (1996); Willoughby, 87 S.W.3d at 513.
281. Willoughby, 87 S.W.3d at 512; see also Cent. of Ga. Ry. Co. v. Lippman, 110 Ga. 665 (1900) (stating that common carriers owe a high standard of care to passengers).
282. Willoughby, 87 S.W.3d at 512; see also Lippman, 110 Ga. at 665 (stating that common carriers usually cannot avoid liability for negligence).
283. Waterman & Henshon, supra note 236, at 15.
284. Id.
285. Id.
286. Id.
287. Id.
288. MITSUBISHI ELEC. CORP., supra note 60; Urmson, Latest Chapter, supra note 70.
product continues to improve.\textsuperscript{289}

IV. RECOMMENDATION

There is currently enough precedential law to determine who should be civilly liable for accidents caused by autonomous vehicles. The law should not adopt current automobile liability schemes because autonomous vehicles are too far removed from current automobiles both in function and likely cause of injury. Instead, each state legislature should adopt a liability scheme that falls in line either with autopilot principles or elevator principles. Whether or not they chose autopilot principles or elevator principles, they should also do this with an open-mind to evolving the standards as more autonomous vehicles data becomes available, much like what was done for elevators.\textsuperscript{290}

It is also important that these decisions are made quickly.\textsuperscript{291} The sooner these decisions are made the better manufacturers can produce products that are most aligned with the laws.\textsuperscript{292} Waiting until these cars are on the road to start making liability schemes could be detrimental and costly to the manufacturers and users.\textsuperscript{293} The liability standards will need to be a balance between assigning responsibilities to the manufacturers without putting undue pressure on the product.\textsuperscript{294} It is important to enable innovation without creating too much risk to the user.

Under either situation, there is a high standard of quality that the manufacturer must maintain—even though they are not identical.\textsuperscript{295} These two options differ in several key ways. In the autopilot scheme, the user of the product must still use the autonomous vehicle in a safe manner that is aligned with the purposes of the product.\textsuperscript{296} In the elevator scheme, the manufacturers are expected to create a product so safe that even a negligent user of the product cannot cause damage by their negligence.\textsuperscript{297}

It will be up to the states to make these decisions. States that are more interested in getting autonomous vehicles on the road quickly can adopt the autopilot scheme. Under this scheme, manufacturers will be less hesitant to sell autonomous cars knowing that the user is more likely to be held liable for any damages caused by the cars. On the other hand, the states that are more hesitant about the safety of these cars and the people inside of them can adopt the modern elevator liability schemes. Under this scheme, the manufacturers will be held liable for just about any incident that is caused as a result of autonomous vehicle accidents.

Additionally, under either autopilot or elevator principles, insurance

\begin{itemize}
    \item \textsuperscript{289} Willoughby v. Montgomery Elevator Co., 87 S.W.3d 509, 512 (Tenn. Ct. App. 2002).
    \item \textsuperscript{290} Id. at 513.
    \item \textsuperscript{291} Fagnant & Kockelman, supra note 59.
    \item \textsuperscript{292} Id.
    \item \textsuperscript{293} Gurney, supra note 165, at 276–77.
    \item \textsuperscript{294} Fagnant & Kockelman, supra note 59 at 16.
    \item \textsuperscript{295} See LeValley, supra note 68, at 9–12 (summarizing the similarities between autopilot in airplanes and ship and elevators with autonomous vehicles).
    \item \textsuperscript{296} Id. at 5, 9–11.
    \item \textsuperscript{297} Id. at 11–12.
\end{itemize}
companies can adopt special autonomous vehicle liability insurance like insurance companies did with elevators as they began to become widely used.\footnote{Id. at 11.}

V. CONCLUSION

Autonomous vehicles are almost certainly going to be part of mainstream culture in the United States in the not too distant future. This new technology will revolutionize land transportation more than any other technology has ever done before. It has the potential to save lives, limit traffic congestions, increase the mobility and freedom of the disabled and elderly, and allow owners to be more efficient with their time. With this new revolution, however, we must expect and be prepared for some accidents to occur. To adequately prepare for these incidents, a set of laws must be clearly established that identifies who is liable when autonomous vehicles are involved in accidents.

These decisions will ultimately be up to the states. The states must decide whether to adopt traditional automobile standards, create an entirely new standard, or base the standard on analogous technologies. Since autonomous vehicles are nearly ready to be sold to the general public, states will likely not have enough time to research and develop an entire set of laws for this new technology. Additionally, they cannot attach autonomous vehicle liability to the already established traditional automobile liability standards because the products are too far removed from one another. Thus, they must use already established laws based on analogous technologies.

Not only is there already enough precedential law for the civil liability when autonomous vehicles are involved in car accidents, there are two unique options available to legislatures that do not involve current automobile liability schemes. States can choose if they want to adopt a policy similar to autopilot in airplanes and ships or a policy similar to elevator liability.

In the autopilot option, liability will be on the user of the autonomous vehicle if there is any evidence of negligent use. If the states adopt the elevator policy, the highest standard of care will be put on the manufacturer of the product, but it will continue to evolve as more data on the product becomes available. The elevator option will encourage the manufacturer to make the safest possible product. The autopilot option will make sure that users of the autonomous vehicles are using a reasonable standard of care.