



UNC  
SCHOOL OF LAW

## NORTH CAROLINA JOURNAL OF LAW & TECHNOLOGY

---

Volume 19 | Issue 4

Article 5

---

1-1-2018

# Putting the Reins on Autonomous Vehicle Liability: Why Horse Accidents Are the Best Common Law Analogy

David King

Follow this and additional works at: <https://scholarship.law.unc.edu/ncjolt>



Part of the [Law Commons](#)

---

### Recommended Citation

David King, *Putting the Reins on Autonomous Vehicle Liability: Why Horse Accidents Are the Best Common Law Analogy*, 19 N.C. J.L. & TECH. 127 (2018).

Available at: <https://scholarship.law.unc.edu/ncjolt/vol19/iss4/5>

This Note is brought to you for free and open access by Carolina Law Scholarship Repository. It has been accepted for inclusion in North Carolina Journal of Law & Technology by an authorized editor of Carolina Law Scholarship Repository. For more information, please contact [law\\_repository@unc.edu](mailto:law_repository@unc.edu).

**PUTTING THE REINS ON AUTONOMOUS VEHICLE LIABILITY:  
WHY HORSE ACCIDENTS ARE THE BEST COMMON LAW  
ANALOGY**

*David King\**

*Autonomous vehicles raise new liability questions on the road because the vehicles themselves can act negligently, independent of the human driver's intentions. For now, these liability questions are expected to be answered through the incremental common law system, rather than by legislation. This means courts will draw analogies and distinctions between autonomous vehicle accidents and pre-existing case law precedent. What courts analogize autonomous vehicle accidents with is likely to have a significant effect on liability rules that determine the responsibilities of drivers, manufacturers, and others.*

*Numerous theories have been proffered on what courts can or should analogize autonomous vehicles with for liability purposes. These include analogies with elevators, autopilot systems, and human beings. Each of these analogy theories have some merit. However, comparing autonomous vehicles to transportation by horse is a superior, yet overlooked, analogy to autonomous vehicles for liability purposes. Horses and autonomous vehicles can both perceive and interpret the world around them, then engage in dangerous maneuvers as a result of misunderstanding their environment. This Recent Development explores the horse analogy theory through the lens of different legal doctrines, such as instrumentality of harm, assumption of the risk, and product liability.*

<b>I. INTRODUCTION .....</b>	<b>128</b>
A. Legislation .....	129
B. Common Law .....	133
<b>II. CURRENT ANALOGY THEORIES.....</b>	<b>135</b>

---

\* J.D. Candidate, University of North Carolina School of Law, 2019.

A. Elevators.....	135
B. Autopilot.....	140
C. Reasonable Car.....	143
<b>III. THE HORSE THEORY .....</b>	<b>145</b>
A. Other Drivers.....	148
B. Instrumentality of Harm.....	150
C. Assumption of the Risk.....	153
D. Product Liability.....	156
<b>IV. CONCLUSION.....</b>	<b>158</b>

### I. INTRODUCTION

Automated vehicles are a form of personalized transportation whereby at least one critical function of the vehicle's control is delegated to a computer.<sup>1</sup> Typically, the vehicle uses sensors, lasers, cameras, and GPS to interpret its surroundings and make decisions about its maneuvers.<sup>2</sup> For example, an autonomous vehicle may recognize pedestrians, cars, and bicyclists, then drive safely around them.<sup>3</sup> Tesla's self-driving cars use a radar and a camera device to see imminent dangers in front of the driver.<sup>4</sup> Then, the Tesla automatically applies the brakes when necessary to avoid a collision or at least reduce the speed of impact.<sup>5</sup> A Tesla also has sensors all around the car to collect data about the path of the car's lane and the

---

<sup>1</sup> See NAT'L HIGHWAY TRAFFIC SAFETY ADMIN., PRELIMINARY STATEMENT OF POLICY CONCERNING AUTOMATED VEHICLES 3 (2017) [hereinafter NHTSA, PRELIM. STATEMENT], [https://www.nhtsa.gov/staticfiles/rulemaking/pdf/Automated\\_Vehicles\\_Policy.pdf](https://www.nhtsa.gov/staticfiles/rulemaking/pdf/Automated_Vehicles_Policy.pdf) (last visited Oct. 31, 2017).

<sup>2</sup> *Id.*

<sup>3</sup> Jeffrey R. Zohn, *When Robots Attack: How Should the Law Handle Self-driving Cars That Cause Damages*, 2015 U. ILL. J.L. TECH. & POL'Y 461, 481 (2015).

<sup>4</sup> See NAT'L HIGHWAY TRAFFIC SAFETY ADMIN., AUTOMATIC VEHICLE CONTROL SYSTEMS 2-4 (2017) [hereinafter NHTSA, DEFECTS INVESTIGATION], <https://static.nhtsa.gov/odi/inv/2016/INCLA-PE16007-7876.PDF> (last visited Sep 18, 2017).

<sup>5</sup> *Id.*

location of nearby vehicles.<sup>6</sup> The car adjusts speed and direction to ensure a safe distance from other vehicles.<sup>7</sup>

The concept of a self-driving car was first introduced by General Motors at the 1939 World Fair.<sup>8</sup> The Defense Advanced Research Projects Agency (“DARPA”) rapidly increased technology development by holding annual competitions where autonomous vehicles attempted to complete an obstacle course.<sup>9</sup> Over time, new advancements in autonomous technology have allowed self-driving cars to operate safely in an increasingly diverse range of circumstances.<sup>10</sup> Now, autonomous vehicles are beginning to enter the consumer market for the first time.<sup>11</sup> The National Highway Traffic Administration said this is the beginning of “a historic turning point for automotive travel.”<sup>12</sup> However, questions about the legal implications of self-driving cars loom over this dramatic shift in transportation.<sup>13</sup>

#### A. Legislation

Forty-one states have introduced autonomous vehicle legislation since 2012,<sup>14</sup> but the pending SELF DRIVE Act<sup>15</sup> may be the most

---

<sup>6</sup> *Id.* at 4.

<sup>7</sup> *Id.*

<sup>8</sup> PC MAGAZINE, *Definition of: Driverless Car*, PC MAGAZINE: ENCYCLOPEDIA, <https://www.pcmag.com/encyclopedia/term/56628/driverless-car> (last visited Oct. 31, 2017).

<sup>9</sup> *See id.*

<sup>10</sup> *See* Scott Le Vine, Alireza Zolfaghari, & John Polak, *Autonomous Cars: The Tension Between Occupant Experience and Intersection Capacity*, TRANSP. RESEARCH PART C 1, 1 (Mar. 2015).

<sup>11</sup> *See id.*

<sup>12</sup> NHTSA, PRELIM. STATEMENT, *supra* note 1, at 1.

<sup>13</sup> Clifford Winston & Fed Mannering, *Implementing Technology to Improve Public Highway Performance: A Leapfrog Technology from the Private Sector Is Going to Be Necessary*, 3 ECON. TRANSP. 158, 164 (2014).

<sup>14</sup> *See* NAT’L CONFERENCE OF STATE LEGISLATURES, *Autonomous Vehicles: Self-driving Vehicles Enacted Legislation*, <http://www.ncsl.org/research/transportation/autonomous-vehicles-self-driving-vehicles-enacted-legislation.aspx> (last updated Oct. 23, 2017).

<sup>15</sup> SELF DRIVE Act, H.R. 3388, 115th Cong. (as passed by House of Representatives, Sept. 7, 2017).

significant legislative activity for autonomous vehicles to date.<sup>16</sup> The SELF DRIVE Act has been passed by the House of Representatives and is now in front of the Senate for consideration.<sup>17</sup> If passed, the Act will allow up to 100,000 autonomous vehicles on public roads for testing and data-collection purposes.<sup>18</sup> The Act requires that the federal government research, test, and certify the safety of autonomous vehicle products, pre-empting any contrary state law.<sup>19</sup> Meanwhile, it leaves “registration, licensing, driving education and training, insurance, law enforcement, crash investigations, safety and emissions inspections” within the authority of the states.<sup>20</sup>

The media has hailed the SELF DRIVE Act as a bipartisan effort<sup>21</sup> that lifts barriers to the advancement of autonomous vehicles.<sup>22</sup> Modern developments in self-driving cars may produce significant economic and social benefits.<sup>23</sup> Autonomous vehicles could avoid the 94% of car accidents caused by human error,<sup>24</sup>

---

<sup>16</sup> See NAT’L CONFERENCE OF STATE LEGISLATURES, *supra* note 14 (showing that almost all legislation passed so far is for autonomous vehicle testing or to empower a regulatory agency to develop substantive law).

<sup>17</sup> Cecilia Kang, *Self-driving Cars’ Prospects Rise with Vote by House*, N.Y. TIMES, (Sept. 6, 2017), <https://www.nytimes.com/2017/09/06/technology/self-driving-cars-prospects-rise-with-vote-by-congress.html?mcubz=1>.

<sup>18</sup> H.R. 3388 § 6(3).

<sup>19</sup> *Id.* §§ 3, 4, 7.

<sup>20</sup> *Id.* § 3.

<sup>21</sup> See, e.g., Aarian Marshall, *Congress Unites (Gasp) to Spread Self-driving Cars Across America*, WIRED, (Sept. 6, 2017), <https://www.wired.com/story/congress-self-driving-car-law-bill/>; Tony Romm, *The House Approved a Bill to Put More Self-Driving Cars on U.S. Roads — But the Senate will be Another Story*, RECODE, <https://www.recode.net/2017/9/6/16259306/house-senate-self-driving-driverless-cars-autonomous> (last visited Oct. 16, 2017).

<sup>22</sup> Kang, *supra* note 17.

<sup>23</sup> See generally Adam Thierer & Ryan Hagemann, *Removing Roadblocks to Intelligent Vehicles & Driverless Cars*, 5 WAKE FOREST J.L. & POL’Y 339, 339 (2015) (advocating against any legislation that may slow the advancement of autonomous vehicle technology).

<sup>24</sup> NAT’L HIGHWAY TRAFFIC SAFETY ADMIN., CRITICAL REASONS FOR CRASHES INVESTIGATED IN THE NATIONAL MOTOR VEHICLE CRASH CAUSATION SURVEY 1 (2015), <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812115>.

saving up to 30,000 lives per year in the United States alone.<sup>25</sup> One day, society may consider it morally reprehensible to drive a car manually when automated cars—purged of human error—reduce dangers to other drivers.<sup>26</sup> Additionally, self-driving cars are expected to improve traffic congestion, fuel usage, parking, mobility for the disabled, and productivity for drivers.<sup>27</sup> Autonomous vehicles may one day be the commonplace norm for personalized transportation.<sup>28</sup> Many academics, journalists, and consumers have called upon legislators to clear legal obstacles that may hinder progress towards that future.<sup>29</sup>

Uncertainty about liability issues is one such obstacle.<sup>30</sup> Autonomous vehicles will inevitably be involved in at least some accidents.<sup>31</sup> These accidents raise new liability questions as to who will be responsible for the car's negligence.<sup>32</sup> Answers to these questions could influence how much control of the vehicle a manufacturer leaves with drivers, who buys insurance, and how many people buy autonomous vehicles.<sup>33</sup> According to the Department of Transportation, “[r]ules and laws allocating tort

---

<sup>25</sup> Janet Fleetwood, *Public Health, Ethics, and Autonomous Vehicles*, 107 AM. J. PUB. HEALTH 532, 532 (2017).

<sup>26</sup> See generally Robert Sparrow & Mark Howard, *When Human Beings Are Like Drunk Robots: Driverless Vehicles, Ethics, and the Future of Transport*, 80 TRANSP. RES. PART C 206 (2017) (analogizing manual driving with drunk driving in that it increases risks to others on the road).

<sup>27</sup> Thierer & Hagemann, *supra* note 23, at 340.

<sup>28</sup> See *id.* at 339.

<sup>29</sup> See generally, e.g., *id.*

<sup>30</sup> Winston & Mannering, *supra* note 13, at 164.

<sup>31</sup> Justin Thomas, Comment, *Putting Programmers in the Driver's Seat: State Tort Systems Applied to Autonomous Automobiles*, 93 U. DET. MERCY L. REV. 553, 554 (2016); Damien A. Riehl, *Car Minus Driver: Autonomous Vehicles Driving Regulation, Liability, and Policy*, BENCH & B. MINN., Oct. 2016, at 21.

<sup>32</sup> Thierer & Hagemann, *supra* note 23, at 360.

<sup>33</sup> *Id.* at 361–62 (“The rationale for such legislative intervention would be supported by the fact that autonomous vehicles represent a socially beneficial technology that may be hindered by real or perceived liability concerns.”).

liability could have a significant effect on both consumer acceptance of [automated vehicles] and their rate of deployment.”<sup>34</sup>

It is possible future federal or state legislation will limit or alter tort liability.<sup>35</sup> Legislators have sometimes limited liability when the magnitude of liability threatens to prevent a desirable product or service from flourishing.<sup>36</sup> Autonomous vehicles could be very expensive to produce if manufacturers were exposed to the risk of litigation for any accident the car is involved in throughout the life of each vehicle.<sup>37</sup>

While the argument for legislative limits or exceptions to manufacturer liability has some rationality, such legislation for new technologies is the exception, not the norm.<sup>38</sup> Additionally, the SELF DRIVE Act implies a legislative intent to leave autonomous vehicle liability to the common law tort system.<sup>39</sup> The Act’s only content on liability reads as follows:

“(e) COMMON LAW LIABILITY.-

(1) IN GENERAL. Compliance with a motor vehicle safety standard prescribed under this chapter does not exempt a person from liability at common law.

(2) RULE OF CONSTRUCTION. Nothing in this section shall be construed to preempt common law claims.”<sup>40</sup>

For the time being, liability rules for autonomous vehicles will likely be determined by the courts through the common law system.

---

<sup>34</sup> NAT’L HIGHWAY TRAFFIC SAFETY ADMIN., FEDERAL AUTOMATED VEHICLES POLICY 46 (2016), <https://www.transportation.gov/sites/dot.gov/files/docs/AV%20policy%20guidance%20PDF.pdf>.

<sup>35</sup> Gary E. Marchant & Rachel A. Lindor, *The Coming Collision Between Autonomous Vehicles & the Liability System*, 52 SANTA CLARA L. REV. 1321, 1337 (2012) (“Another line of defense for autonomous vehicle manufacturers would be legislation at either the federal or state level that would protect against, or limit, liability.”).

<sup>36</sup> See *id.* at 1337–38.

<sup>37</sup> See *id.*

<sup>38</sup> *Id.*

<sup>39</sup> H.R. 3388 § 3(2)(e).

<sup>40</sup> *Id.*

### B. Common Law

The SELF DRIVE Act leaves liability rules up to state common law,<sup>41</sup> but no common law precedent has been established for autonomous vehicles.<sup>42</sup> How tort common law applies to owners, drivers, manufacturers, or others in the context of an autonomous vehicle is unclear.<sup>43</sup> Many liability rules will likely develop incrementally over time through the common law system and may depend on the facts of each individual case or the jurisdiction of the accident.<sup>44</sup> Additionally, the United States Department of Transportation's report on a fatal autonomous vehicle accident in Florida provides some guidance from an administrative agency.<sup>45</sup>

What common law precedent courts analogize with self-driving cars will likely be critical to autonomous vehicle liability rules. One analogy theory suggests that courts could compare autonomous vehicles to elevators, which used to be operated manually but later became more automated.<sup>46</sup> This analogy would result in autonomous vehicle owners being responsible for most injuries, even when someone else is driving, because owners must ensure the vehicle is in safe operating condition.<sup>47</sup> Another analogy theory suggests that

---

<sup>41</sup> *Id.*

<sup>42</sup> Marchant & Lindor, *supra* note 35, at 1324 (“Not surprisingly, there has not been any reported personal injury litigation regarding these products to date.”).

<sup>43</sup> Thomas, *supra* note 31, at 554 (“The law regarding autonomous vehicle liability, however, is unclear.”).

<sup>44</sup> Thierer & Hagemann, *supra* note 23, at 361 (“Legal standards here could evolve gradually through the common law as they have for traditional automobiles and many other technologies.”).

<sup>45</sup> See generally NHTSA, DEFECTS INVESTIGATION, *supra* note 4.

<sup>46</sup> Kyle Colonna, *Autonomous Cars & Tort Liability*, 4 CASE W. RESERVE J.L. TECH. & INTERNET 81, 91–92 (2012).

<sup>47</sup> 26 AM. JUR. 2D *Elevators and Escalators* § 13 (2017) (stating property owners are liable for defective construction, negligent operation, or poor maintenance of an elevator, unless close inspection would not have revealed the danger); Zohn, *supra* note 3 (“The person inside an elevator at the time of the accident cannot be held liable unless they are exceptionally negligent.”); K. Krasnow Waterman & Matthew T. Henshon, *Imagine the Ram-If-Ications Assessing Liability for Robotics-based Car Accidents*, ABA SciTech Law., at 15 (Spring 2009), at 15 (2009) (“[E]levator lawsuits almost always arise from injury to occupants of a malfunctioning elevator, not due to injuries to other elevators or the persons riding inside them.”).

courts analogize autonomous vehicles to autopilot systems.<sup>48</sup> This approach would result in drivers being liable for most accidents, because of their misuse of, or excessive reliance on, the car's autonomous features.<sup>49</sup> Finally, another proposed theory analogizes an autonomous vehicle to a human driver by proposing a "reasonable car" standard.<sup>50</sup> Under this analogy, the manufacturer would be liable any time an autonomous vehicle does not act reasonably.<sup>51</sup>

This Recent Development argues that the most compelling analogy theory for liability purposes is to compare autonomous vehicles to transportation by horses. Horses and self-driving cars are both property owned and operated by humans, but with a mind of their own. Both horses and autonomous vehicles can perceive their surroundings, misinterpret the danger of objects or events around them, and make dangerous maneuvers not intended by their human driver.<sup>52</sup> The analysis proceeds in three parts. Part II reviews the pre-existing theories courts will analogize autonomous vehicles with, namely elevators, autopilot systems, or human beings. Part III introduces the horse analogy and discusses how it would apply to autonomous vehicles. Additionally, it examines the horse analogy through the lens of different liability doctrines, such as product liability, imputed passenger liability, and assumption of the risk.

---

<sup>48</sup> Marchant & Lindor, *supra* note 35, at 1324–25.

<sup>49</sup> Dylan LeValley, Comment, *Autonomous Vehicle Liability—Application of Common Carrier Liability*, 36 SEATTLE U. L. REV. SUPRA 5, 9 (2013) (“[M]ost litigation over liability arising from an accident involving an autopilot has determined that human error by the operators, not malfunctioning of the autopilots, was the cause of the accident.”).

<sup>50</sup> See generally K.C. Webb, *Products Liability & Autonomous Vehicles: Who's Driving Whom?*, 23 RICH. J.L. & TECH. 9, 34 (2016), [http://jolt.richmond.edu/2017/05/13/volume23\\_issue4\\_webb/](http://jolt.richmond.edu/2017/05/13/volume23_issue4_webb/) (advocating for the reasonable car standard based on an analogy with human drivers).

<sup>51</sup> *Id.* at 34.

<sup>52</sup> Compare Neal Boudette, *Tesla's Self-driving System Cleared in Deadly Crash*, N.Y. TIMES, Jan. 19, 2017, <https://www.nytimes.com/2017/01/19/business/tesla-model-s-autopilot-fatal-crash.html?mcubz=1> (reporting on a self-driving Tesla that saw a truck, failed to understand it was a dangerous object, and drove straight into it.), with *Alpha Constr. Co. v. Branham*, 337 S.W.2d 790 (Ky. 1960) (discussing a case where a horse heard noises from a truck, failed to understand it was not dangerous, and jumped into the street in fright.).

## II. CURRENT ANALOGY THEORIES

Academics have proffered numerous theories about what common law precedent courts will use to analogize with autonomous vehicles.<sup>53</sup> This section will discuss pre-existing analogy theories for (1) elevators, (2) autopilot systems, and (3) human drivers.

### A. Elevators

One of the more popular analogy theories that courts could compare autonomous vehicles to is elevators.<sup>54</sup> Elevators can be thought of as a vehicle that transports people vertically.<sup>55</sup> They used to be operated manually, but at some point became more automated.<sup>56</sup> Many elevators even engage in a type of intelligent traffic flow, whereby each elevator in a set chooses which floor to go to based on the direction passengers are heading.<sup>57</sup> A passenger on an elevator is not expected to oversee the elevator's "driving" decisions.<sup>58</sup> Passengers merely press a button to reach their destination.<sup>59</sup>

Barring extraordinary circumstances, elevator users are not liable for injuries they suffer in an elevator<sup>60</sup> because it is difficult

---

<sup>53</sup> See, e.g., Colonna, *supra* note 46, at 86 (mentioning biotechnology, autopilot, elevators, autonomous trains, and robots); Marchant & Lindor, *supra* note 35, at 1324–25 (mentioning autopilot, cruise control, and industrial robots); Webb, *supra* note 50, at 33–37, 48 (mentioning elevators, autopilot, automotive technology, and humans); Zohn, *supra* note 3, at 481–84 (mentioning elevators and autopilot).

<sup>54</sup> Colonna, *supra* note 46, at 86; Webb, *supra* note 50, at 33–37; Zohn, *supra* note 3, at 480 (“[The] two most analogous technologies are elevators and autopilot on airplanes and ships.”).

<sup>55</sup> Colonna, *supra* note 46, at 102.

<sup>56</sup> *Id.* at 91–92.

<sup>57</sup> Waterman & Henshon, *supra* note 47, at 3 (“[I]n recent years, smart technology has been introduced to create efficient traffic flow in a bank of elevators.”).

<sup>58</sup> See Zach Matthews & Christopher K. Jones, *Defending the First Wave: Autonomous Trucking and the Death of Driver Negligence?*, 57 No. 12 DRI For Def. 59 at 61 (noting that since the 1970s, elevators have been almost entirely computer controlled).

<sup>59</sup> Waterman & Henshon, *supra* note 47, at 15.

<sup>60</sup> Zohn, *supra* note 3, at 483.

for passengers to be negligent while inside a self-driving box they have little control over.<sup>61</sup> Accidents almost always occur because of a malfunction of the elevator.<sup>62</sup> The landlord that owns and controls the elevator is liable for most injuries<sup>63</sup> because owners are expected to inspect, maintain, and repair their elevators to ensure safe operating condition.<sup>64</sup>

In most states, the owner of an elevator has a heightened duty of care as a common carrier.<sup>65</sup> A common carrier is a person or organization that transports human passengers as a service.<sup>66</sup> Common carriers have a duty of utmost care, rather than that of a reasonable person, because passengers place their body into the common carrier's exclusive control, entrusting the service's locomotives and procedures with their safety.<sup>67</sup> Although it has been argued that autonomous vehicle manufacturers would be common carriers under the elevator analogy,<sup>68</sup> common carrier liability attaches to the owner of an elevator, not the manufacturer.<sup>69</sup> Under the elevator analogy, the owner of an autonomous vehicle would be liable in most accidents for failing to ensure the safety of occupants in their vehicle, even if the owner was not "driving" at the time an accident occurred.

---

<sup>61</sup> See generally Mark A. Franklin, *California's Extension of Common Carrier Liability to Roller Coasters & Similar Devices: An Examination of Gomez v. Superior Court of Los Angeles*, 34 W. ST. U. L. REV. 29 (2006) (stating that the justification for shifting liability to common carriers like elevator operators is that passengers have little control over the vehicle and rely completely on the common carrier for their safety).

<sup>62</sup> Matthews & Jones, *supra* note 58, at 61 ("elevator lawsuits almost always arise from injury to occupants of a malfunctioning elevator, not due to injuries to other elevators or the persons riding inside them").

<sup>63</sup> 50 N.Y. JUR. 2D *Elevators and Escalators* § 23 (2017).

<sup>64</sup> 26 AM. JUR. 2D *Elevators and Escalators* § 10 (2017).

<sup>65</sup> Matthews & Jones, *supra* note 58, at 61.

<sup>66</sup> See generally Franklin, *supra* note 61.

<sup>67</sup> *Id.*

<sup>68</sup> See generally LeValley, *supra* note 49 (arguing in part IV that autonomous vehicle manufacturers should owe a duty similar to that of common carriers).

<sup>69</sup> Willoughby v. Montgomery Elevator Co., 87 S.W.3d 509, 512 (Tenn. Ct. App. 2002); Matthews & Jones, *supra* note 58, at 61; see also Tim Higgins, *The End of Car Ownership*, WALL ST. J. (June 20, 2017), <https://www.wsj.com/articles/the-end-of-car-ownership-1498011001>.

In a distant future, autonomous vehicles that are analogous to elevators may be commonplace. Individual car ownership could fade in favor of cars owned by businesses and provided as a service.<sup>70</sup> For a small fee, users could tap a button on their smartphone app to hail an autonomous vehicle to their location, get in the car, and be transported to their destination.<sup>71</sup> This could all be done in a self-driving car that lacks any meaningful controls or driver responsibilities for the human passenger.<sup>72</sup> Autonomous vehicles could even operate on a track, like elevators do.<sup>73</sup>

However, the elevator analogy theory relies on a vision for autonomous vehicles in a distant future. Unlike elevators, personal autonomous vehicles are expected to require some degree of human control and oversight for the foreseeable future.<sup>74</sup> Experts predict it will take ten to twenty years for autonomous vehicles to be able to drive themselves safely under most circumstances.<sup>75</sup> To provide autonomous vehicle transportation as a service—shifting ownership of vehicles from individuals to common carriers—would require fully automated technology.<sup>76</sup> Most research predicts this level of automation will not make a significant presence on the road until the

---

<sup>70</sup> *Id.* See generally Daniel J. Fagnant & Kara M. Kockelman, *The Travel and Environmental Implications of Shared Autonomous Vehicles, Using Agent-based Model Scenarios*, 40 TRANSP. RES. PART C 1–13 (2014).

<sup>71</sup> Higgins, *supra* note 69.

<sup>72</sup> Douglas Ernst, *Ford: Autonomous Cars with No Steering Wheel, Gas and Break Pedals by 2021*, WASH. TIMES (Aug. 16, 2016), <http://www.washingtontimes.com/news/2016/aug/16/ford-autonomous-cars-with-no-steering-wheel-gas-an/> (last visited Nov 2, 2017).

<sup>73</sup> Tina Amirtha, *Forget Self-driving Cars: Here's How Driverless Trains Are Moving Ahead*, ZDNET (April 6, 2017), <http://www.zdnet.com/article/forget-self-driving-cars-heres-how-driverless-trains-are-moving-ahead/> (last visited Nov 2, 2017).

<sup>74</sup> Mica R. Endsley, *From Here to Autonomy*, 59 HUMAN FACTORS 5, 21 (2017).

<sup>75</sup> See generally Zia Wadud, Don MacKenzie, & Paul Leiby, *Help or Hindrance? The Travel, Energy and Carbon Impacts of Highly Automated Vehicles*, 86 TRANSP. RES. PART A 5 (2016).

<sup>76</sup> *Id.* at 3, 7, 10 (discussing transportation provided as a service through autonomous vehicles owned by the service, once level 4 automation (complete automation) is achieved).

2030s or 2040s.<sup>77</sup> Furthermore, autonomous vehicles are generally being developed to understand and respond to the world around them, not to operate on a track.<sup>78</sup> The elevator analogy may be compelling for futurists, but no sensible consumer, manufacturer, or other party has a practical need to speculate about liability rules several decades in the future.

Also, even in a distant future where autonomous vehicles are analogous to elevators, the analogy would have little utility. If autonomous vehicle transportation is provided as a service and the locomotive is automated with no meaningful control by the driver, the service provider (not the manufacturer) would be a common carrier.<sup>79</sup> The passenger, lacking any significant driving responsibilities, would be subjected to the provider's exclusive control.<sup>80</sup> A novel type of vehicle (self-driving cars) would not cloud common carrier status.<sup>81</sup> In a future where autonomous vehicle transportation is provided as a service by a common carrier, it would be much more practical to analogize the service provider to any number of other common carriers, such as taxis or autonomous trains, rather than elevators.<sup>82</sup>

Furthermore, the elevator analogy does not conform to a sensible distribution of liability in foreseeable autonomous vehicle accident

---

<sup>77</sup> Prateek Bansal & Kara M. Kockelman, *Forecasting Americans' Long-term Adoption of Connected and Autonomous Vehicle Technologies*, 95 *TRANSP. RESEARCH PART A* 49–63 (2017).

<sup>78</sup> *See e.g.* Zohn, *supra* note 3, at 481 (“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.”).

<sup>79</sup> *See generally* Franklin, *supra* note 61, at 33–37 (discussing the extension of common carrier liability to rollercoaster operators in California).

<sup>80</sup> *See id.* at 36.

<sup>81</sup> 11 TERESA J. FARRIS, PAUL R. KEANE & RAYMOND J. KENNEY, *MASSACHUSETTS PRACTICE: MOTOR VEHICLE LAW AND PRACTICE* § 8:2 (4th ed. 2017), Westlaw MAPRAC (“[M]eager evidence is sufficient to establish its status as [a common carrier]”).

<sup>82</sup> Colonna, *supra* note 46, at 102 (“Autonomous trains are analogous to elevators, except that autonomous trains operate on a horizontal axis instead of a vertical axis.”); FARRIS ET AL., *supra* note 81, § 8:2 (“An owner-operator of taxicabs may properly be regarded as a common carrier of passengers for hire[.]”).

scenarios. It is rare for an elevator passenger to be negligent.<sup>83</sup> In contrast, human drivers are “[a]t the heart of safety concerns” in autonomous vehicles.<sup>84</sup> For example, a human driver may fail to take over manual control when prompted, may tell the vehicle to exceed the speed limit, or may use the self-driving features on a road for which they are not intended.<sup>85</sup>

Finally, the elevator analogy does not conform to the Department of Transportation’s guidance based on a fatal autonomous vehicle accident in Florida.<sup>86</sup> The elevator analogy would imply passengers have no responsibilities as they are transported in a common carrier’s self-driving box. In the report, the Department of Transportation mentioned the “driver” approximately 75 times.<sup>87</sup> It pointed out that the driver did not pay attention, did not follow the car’s instructions, and took no action to avoid collision.<sup>88</sup> Elevator users do not have any analogous duties. The report said manufacturers could be responsible for an accident caused by foreseeable abuse of the autonomous vehicle by the owner.<sup>89</sup> This is in stark contrast to the common carrier liability

---

<sup>83</sup> Matthews & Jones, *supra* note 58, at 61 (“[E]levator lawsuits almost always arise from injury to occupants of a malfunctioning elevator, not due to injuries to other elevators or the persons riding inside them.”).

<sup>84</sup> Francesca M. Favarò et al., *Examining Accident Reports Involving Autonomous Vehicles in California*, 12 PLOS ONE e0184952 at 2 (September 20, 2017), <http://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0184952&type=printable>.

<sup>85</sup> See NHTSA, DEFECTS INVESTIGATION, *supra* note 4, at 1, 9–12 (indicating driver can be responsible for an accident by failing to pay attention to the road, ignoring the car’s warnings, and not reading the owner’s manual); David Shepardson, *Tesla Driver in Fatal ‘Autopilot’ Crash Got Numerous Warnings: U.S. Government*, REUTERS, 2017, <https://www.reuters.com/article/us-tesla-crash/tesla-driver-in-fatal-autopilot-crash-got-numerous-warnings-u-s-government-idUSKBN19A2XC> (last visited Sep 20, 2017) (mentioning that the driver was exceeding the speed limit).

<sup>86</sup> NHTSA, DEFECTS INVESTIGATION, *supra* note 4, at 1.

<sup>87</sup> *Id.* at 1–12.

<sup>88</sup> *Id.* at 1.

<sup>89</sup> *Id.* at 10 n. 19.

elevators impart to owners of the vehicle to protect their passengers against foreseeable harms.<sup>90</sup>

Someday autonomous vehicles may be more analogous to a common carrier, leaving almost all liability exposure with the business that is providing a transportation service. However, by then there may also be more legislative controls, and it would be more sensible to analogize autonomous vehicles with taxis or autonomous trains than the counter-intuitive elevator analogy. Speculating about a distant future can be an interesting intellectual exercise, but is not a recipe for practical and actionable analysis.

### B. *Autopilot*

Another analogy theory is that courts could compare autonomous vehicles to the autopilot systems used in ships and planes.<sup>91</sup> This analogy addresses some of the issues of the elevator theory. Autopilot involves partially automated control of a vehicle, with oversight from a human pilot.<sup>92</sup> Most autopilot features observe and respond to a dynamic environment, such as changes in wind, other vessels, and wildlife,<sup>93</sup> rather than operating on a track as an elevator does.

In most cases, pilots and their employers are liable for accidents involving autopilot systems.<sup>94</sup> Technically, liability attaches to the

---

<sup>90</sup> See 6 WASH. SUPREME COURT COMM. ON JURY INSTRUCTIONS, WASHINGTON PRACTICE: PATTERN JURY INSTRUCTIONS WPI 100.03 (6th ed. 2013), Westlaw WAPRAC; 4 HENRY P. TRAWICK, JR., FLORIDA PLEADING AND PRACTICE FORMS § 33:19 (2017), Westlaw FL-PP (stating that a common carrier can even be liable for foreseeable criminal assaults by other passengers).

<sup>91</sup> Zohn, *supra* note 3, at 481–82.

<sup>92</sup> LeValley, *supra* note 49, at 9–10 (“In the contexts of airplanes and ships, constant oversight is both implied and expected, thus reducing the role of the autonomous technology.”); Webb, *supra* note 50, at 26 (“Nor do AVs fit well into a category with autopilot systems for airplanes and boats, which require human vigilance and intervention. Requiring human vigilance of AVs is incomparable to autopilot systems because pilots are highly trained, air traffic is highly regulated, and there are far less planes in the sky than cars on the road.”).

<sup>93</sup> Zohn, *supra* note 3, at 481.

<sup>94</sup> LeValley, *supra* note 49, at 9 (“[M]ost litigation over liability arising from an accident involving an autopilot has determined that human error by the operators, not malfunctioning of the autopilots, was the cause of the accident.”).

manufacturer of the autopilot system, unless there is evidence of negligence by the pilot.<sup>95</sup> In practice, there is almost always enough evidence of pilot negligence to shift liability.<sup>96</sup> For example, pilots can be liable for using a boat's autopilot system in shallow water for which it was not intended, or for loading an airplane with imbalanced cargo which the autopilot could not handle.<sup>97</sup> Most airplane autopilot accidents are caused by misuse of autopilot during take-off or landing, where use of autopilot is discouraged.<sup>98</sup> Manufacturers do not have a duty to train pilots on how to use their autopilot software safely.<sup>99</sup> Applying the autopilot analogy to autonomous vehicles would impart liability on drivers in most cases, such as for using the autonomous features incorrectly, failing to learn to use the autonomous features safely, or not addressing the autonomous features' limitations.

Autopilot is a stronger analogy than elevators, but also has some substantial distinctions from autonomous vehicles. The level of attention and training expected of a professional, licensed pilot is not comparable to what is expected from the average automobile driver.<sup>100</sup> Studies show consumers do not perform well at maintaining vigilance over long periods of time in a task that is not substantially interactive.<sup>101</sup> Additionally, most autopilot technology on ships and planes is intended to keep the vehicle on a straight path determined by the pilot or make slight changes along the path without getting pushed off-course by wind or current.<sup>102</sup> In contrast,

---

<sup>95</sup> Zohn, *supra* note 3, at 481.

<sup>96</sup> *Id.* ("Historically, the majority of autopilot accidents have been caused by human error of the pilot.").

<sup>97</sup> *Id.* at 481–82.

<sup>98</sup> *Id.* at 481.

<sup>99</sup> *Glorvigen v. Cirrus Design Corp.*, 816 N.W.2d 572, 582 (Minn. 2012).

<sup>100</sup> Zohn, *supra* note 3, at 482.

<sup>101</sup> Webb, *supra* note 50, at 26 ("Ergonomic research indicates human brains are not good at routine supervision tasks, so if an AV goes for many miles without incident, the human driver will likely stop paying attention.").

<sup>102</sup> See Colonna, *supra* note 46, at 94–95 ("Most autopilots work by making slight changes in the heading of the plane and do not require significant adaptations."); LeValley, *supra* note 49, at 10.

an autonomous vehicle might make discrete choices to stop, go, or turn and respond to the vehicles around it.<sup>103</sup>

The autopilot analogy conforms to some of the guidance provided by the Department of Transportation in its report about a fatal autonomous vehicle accident in Florida.<sup>104</sup> However, the report is aligned with the outcome of applying the autopilot analogy only because the driver's negligence was extraordinary. In the Florida accident, the driver was watching a Harry Potter movie<sup>105</sup> and ignored repeated warnings from the car to take over manual control.<sup>106</sup> The autonomous vehicle hit a truck that was visible for seven seconds, yet the driver made no effort to avoid collision.<sup>107</sup> Additionally, the driver was using the autonomous features on city streets, whereas it was only intended for freeway use.<sup>108</sup> The autopilot analogy makes sense for this accident but becomes less applicable in a more nuanced case.

For example, in autopilot case law, a pilot can be liable for improperly loading a plane.<sup>109</sup> However, the Department of Transportation has found that manufacturers can be liable for accidents caused by foreseeable misuse of the product by the owner.<sup>110</sup> This indicates that autonomous vehicles can shift some liability away from the amateur driver and onto the manufacturer, as compared to autopilot cases. The Department of Transportation report described some potential duties of autonomous vehicle manufacturers that included alerting the driver of limitations of the autopilot system, developing a method for ensuring the driver is paying attention, minimizing the potential for confusion about whether autopilot is engaged, and considering limiting functionality

---

<sup>103</sup> LeValley, *supra* note 49, at 10.

<sup>104</sup> See generally NHTSA, DEFECTS INVESTIGATION, *supra* note 4, at 1, 5–6.

<sup>105</sup> *Id.*

<sup>106</sup> Shepardson, *supra* note 85.

<sup>107</sup> *Id.*

<sup>108</sup> NHTSA, DEFECTS INVESTIGATION, *supra* note 4, at 4 (“The Tesla Model S owner’s manual states that TACC ‘is primarily intended for driving on dry, straight roads, such as highways and freeways. It should not be used on city streets.’”).

<sup>109</sup> Zohn, *supra* note 3, at 481–82.

<sup>110</sup> NHTSA, DEFECTS INVESTIGATION, *supra* note 4, at 10.

on roads for which autopilot is inappropriate.<sup>111</sup> These duties differ from the more limited responsibilities of autopilot system manufacturers, who are selling to professional pilots.<sup>112</sup>

Under the autopilot analogy theory, most liability would be given to autonomous vehicle drivers for misusing the autopilot or failing to recognize its limitations. In comparison, autonomous vehicle accidents will likely involve a higher burden on manufacturers, who cannot expect their customers to be professional drivers.

### C. Reasonable Car

Another analogy theory is that the courts could compare autonomous vehicles with human drivers, creating a reasonable car standard.<sup>113</sup> The reasonable car standard could be evaluated by taking data the autonomous vehicle collects just before an accident and evaluating whether most autonomous vehicles would have avoided the collision in similar circumstances.<sup>114</sup> The standard of reasonableness would adjust as the average performance of autonomous vehicles improves with technology.<sup>115</sup>

This analogy would conform to a common theory that the proliferation of autonomous vehicles will result in giving manufacturers, rather than drivers, liability for most accidents.<sup>116</sup> One journal went as far as to say autonomous vehicles will be “the death of driver negligence.”<sup>117</sup> However, the reasonable car theory does leave room for a negligent driver to misuse a reasonable car.<sup>118</sup>

The reasonable person doctrine is the basis for the reasonable car standard. The reasonable person is an abstract “mythical

---

<sup>111</sup> *Id.* at 5–6.

<sup>112</sup> *Glorvigen v. Cirrus Design Corp.*, 816 N.W.2d 572, 583 (Minn. 2012).

<sup>113</sup> *Webb*, *supra* note 50, at 34.

<sup>114</sup> *Id.* at 48.

<sup>115</sup> *Id.* at 49.

<sup>116</sup> *See, e.g., Riehl*, *supra* note 31 (“The advent of autonomous vehicles points to a seemingly inescapable shift in historical standards for auto crashes—from driver/owner liability to a product liability regime.”).

<sup>117</sup> *Matthews & Jones*, *supra* note 58, at 59.

<sup>118</sup> *Webb*, *supra* note 50, at 34–35.

creation” that represents a “community ideal.”<sup>119</sup> Sometimes it can be reversible error to compare the reasonable person to an actual human being.<sup>120</sup> The reasonable person knows how human beings behave and possesses widely known knowledge of common dangers.<sup>121</sup> Often a reasonable person may be framed in the context of the “Hand Formula” whereby the jury determines whether the risks of the defendant’s actions were reasonable when compared to the burden of safeguarding against those risks.<sup>122</sup>

This concept does not apply well to autonomous vehicles. First, the courts have never applied the reasonable person standard to property, even when that property is autonomous. For example, the owner of an autonomous living animal, not the animal itself, may be subject to the reasonable person standard.<sup>123</sup>

Second, the reasonable car standard would be difficult to apply to actual accidents, such as the one in Florida.<sup>124</sup> There, the vehicle did not recognize a white truck against a bright sky and drove straight into the truck.<sup>125</sup> How would one apply the Hand Formula in this scenario? The autonomous vehicle did not weigh the risks against the burden of safeguards. Rather, it failed to interpret the world around it. In contrast, applying the Learned Hand formula to software design choices has robust, legal precedent and established law.<sup>126</sup> Software designers can be negligent by poorly weighing the

---

<sup>119</sup> Peter N. Swisher, Robert E. Draim & David D. Hudgins, *The Objective Reasonable Person Standard of Care*, 13 VIRGINIA PRACTICE: TORT AND PERSONAL INJURY LAW § 3:3 (2015).

<sup>120</sup> *Id.*

<sup>121</sup> *Id.*

<sup>122</sup> Michael L. Rustad & Thomas H. Koenig, *Extending Learned Hand’s Negligence Formula to Information Security Breaches*, 3 I/S: J. L. & POL’Y FOR INFO. SOC’Y 237, 241 (2007). *See generally* Stephen G. Gilles, *The Invisible Hand Formula*, 80 VA. L. REV. 1015 (1994).

<sup>123</sup> ALLISON E. BUTLER, 33 CAUSES OF ACTION 293 § 7 (2007 2d ed.).

<sup>124</sup> NHTSA, DEFECTS INVESTIGATION, *supra* note 4; Boudette, *supra* note 52.

<sup>125</sup> Boudette, *supra* note 52.

<sup>126</sup> *See* Donald R. Ballman, *Software Tort: Evaluating Software Harm by Duty of Function & Form*, 3 CONN. INS. L.J. 417, 461 (1997). *See generally* Rustad & Koenig, *supra* note 122 (comprehensive paper on applying the Learned Hand formula to data security).

inconvenience of a safety feature against the risks caused by its absence.<sup>127</sup>

Third, a reasonable car standard merely introduces a new and unnecessary concept that competes with the pre-existing legal doctrine of industry custom. Custom in an industry can be an important factor in determining the reasonableness of a design choice and is based on what reasonable precautions competitors have taken.<sup>128</sup> The doctrine of industry custom enjoys a long and developed history, whereas the reasonable car standard is a novel approach that simply reiterates the need to compare the car to those manufactured by other brands.

Most modern products liability cases focus on design defects made by human beings.<sup>129</sup> The reasonable car theory would be a bold departure from pre-existing legal precedent. It would amount to abandoning the legal tradition of drawing analogies and distinctions from pre-existing precedent, rather than creating new law from the bench.

### III. THE HORSE THEORY

A stronger analogy is to compare autonomous vehicles to horses, a much older form of autonomous property that has a long history of being used for transportation. Both horses and self-driving cars can perceive their environment, misunderstand their surroundings, and make dangerous maneuvers, independent of the human operator's will.<sup>130</sup>

For example, in *Alpha Construction v. Branham*, a horse walking on the side of a road heard loud noises from a truck, thought

---

<sup>127</sup> Ballman, *supra* note 126.

<sup>128</sup> See generally David A. Urban, *Custom's Proper Role in Strict Product Liability Actions Based on Design Defect*, 38 UCLA L. REV. 439 (1990).

<sup>129</sup> Kristine Cordier Karnezis, Annotation, *Summary and Comment—Generally*, 96 A.L.R.3d 22 § 2(a) (1979).

<sup>130</sup> Compare Boudette, *supra* note 52 (reporting that a self-driving Tesla saw a large object in front of it, did not properly interpret it as a white truck against a bright sky, and drove straight into it), with *Alpha Constr. Co. v. Branham*, 337 S.W.2d 790 (Ky. 1960) (discussing a case where a horse heard noises from a large truck, falsely interpreted it as something dangerous, and jumped in front of it in fright).

it was dangerous, got spooked, and galloped into the street.<sup>131</sup> In the Tesla accident in Florida, the autonomous vehicle saw a white truck against a bright sky, though it was *not* dangerous, and drove straight into the truck.<sup>132</sup> In both cases, the locomotive failed to make what most humans would consider a common-sense interpretation of the dangers around them. The vehicles made dangerous maneuvers because they lacked adequate intelligence to genuinely understand their surroundings.

Although horses and cars may seem like very different objects today, there was a time when it was not so unusual to compare the two. In the early 1900s, some people would call cars “a machine with a horse like quality” or a “horseless carriage.”<sup>133</sup> In 1940, one United States Army colonel said: “[a] machine has no life; horses have—that is the radical difference.”<sup>134</sup> From a liability perspective, the transition from horses to cars meant moving from a vehicle with a mind of its own, to one that rarely acts against the driver’s orders. Autonomous vehicles have not returned “life” to vehicles, but they have given vehicles the ability to think and act on their own, which is a characteristic more analogous to transportation by horse. It does not necessarily make a legal difference that a horse is made of blood and bone whereas an autonomous vehicle is made of steel and computer boards.<sup>135</sup> Perhaps the reason a horse analogy has been overlooked is that academics have only considered what *technology* autonomous vehicles could be analogized with.<sup>136</sup>

---

<sup>131</sup> See *Alpha Constr. Co. v. Branham*, 337 S.W.2d 790 (Ky. 1960).

<sup>132</sup> See Boudette, *supra* note 52.

<sup>133</sup> IMES CHIU, THE EVOLUTION FROM HORSE TO AUTOMOBILE: A COMPARATIVE INTERNATIONAL STUDY 59 (2009).

<sup>134</sup> *Id.* at 2.

<sup>135</sup> See, e.g., Colonna, *supra* note 46, at 130 (“[T]he combination of software and hardware is somewhat analogous to a human’s skeletal and central nervous systems.”).

<sup>136</sup> See, e.g., Marchant & Lindor, *supra* note 35, at 1324 (“There are, however, a number of *analogous technologies* that have been the subject of litigation.”) (emphasis added); Zohn, *supra* note 3, at 481 (“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.”) (emphasis added).

As with the other analogy theories, the horse analogy has its own pitfalls. Horses are widely known for being unpredictable and dangerous.<sup>137</sup> In contrast, autonomous vehicles are considered safer and less erratic than human drivers, in most circumstances.<sup>138</sup> In some ways, horses are less autonomous than some self-driving cars. On a horse, decisions regarding when to stop, go, or turn are typically controlled by individual human commands.<sup>139</sup> In other ways, the horse is more autonomous. The rider of a horse may lose complete control,<sup>140</sup> whereas an autonomous vehicle may allow the human driver to take over at any time.<sup>141</sup> Finally, horses probably require more skill to ride than autonomous vehicles take to use.<sup>142</sup> For both horses and autonomous vehicles, safety can be improved by the rider's skill and experience.<sup>143</sup>

---

<sup>137</sup> Kirrilly Thompson, Paul McGreevy & Phil McManus, *A Critical Review of Horse-Related Risk: A Research Agenda for Safer Mounts, Riders and Equestrian Cultures*, 5 ANIMALS 561 (2015) (stating horse riding is more dangerous than motorcycles, skiing, and football).

<sup>138</sup> See, e.g., Nidhi Kalra & Susan M. Paddock, *Driving to Safety: How Many Miles of Driving Would It Take to Demonstrate Autonomous Vehicle Reliability?*, 94 TRANSP. RES. PART A 182, 182–83 (2016) (“Autonomous vehicles have the potential to significantly mitigate this public health crisis by eliminating many of the mistakes that human drivers routinely make. To begin with, autonomous vehicles are never drunk, distracted, or tired[.]”) (citation omitted).

<sup>139</sup> See generally CLAIRE LILLEY, STOP, GO, TURN: PERFECTING THE BASICS OF RIDING (2014).

<sup>140</sup> See, e.g., *State Farm Mut. Auto. Ins. Co. v. Shoaf*, 4 Ohio App. 3d 122, 446 (1982) (discussing a case where a horse owner lost control).

<sup>141</sup> *The Long, Winding Road for Driverless Cars*, ECONOMIST (May 25, 2017), <https://www.economist.com/news/science-and-technology/21722628-forget-hype-about-autonomous-vehicles-being-around-corner-real-driverless-cars-will> (last visited Oct 17, 2017) (“[T]he driver must be ready to take full control of the vehicle at any instant.”).

<sup>142</sup> See generally LILLEY, *supra* note 139 (stating that it can take months or years to perfect basic riding technique).

<sup>143</sup> Siraj Shaikh, *A Framework for Analysing Driver Interactions with Semi-Autonomous Vehicles*, FIRST INT’L WORKSHOP FORMAL TECH. FOR SAFETY-CRITICAL SYS., 85 (2012); Meredith Chapman & Kirrilly Thompson, *Preventing and Investigating Horse-related Human Injury and Fatality in Work and Non-work Equestrian Environments: A Consideration of the Workplace Health and Safety Framework*, 6 ANIMALS 33 (2016).

These differences—the degree of skill, danger, and predictability of the vehicle—speak to the degree of precaution expected of a reasonable person *under the circumstances*.<sup>144</sup> In this way, the horse analogy shares milder forms of the same shortcomings of the autopilot analogy: a greater degree of skill and oversight expected from the operator of the vehicle. However, since greater skills and precaution are expected of pilots than horseback riders, the horse analogy is much closer to autonomous vehicles.

The following sub-sections will further explore the horse analogy from the perspective of different parties and legal doctrines.

#### A. *Other Drivers*

Any number of third parties could be negligent for creating circumstances likely to confuse an autonomous vehicle.<sup>145</sup> For example, a black car driving at night with broken headlights could confuse an autonomous vehicle that does not recognize it against a dark background.<sup>146</sup> There is no analogous equivalent for pilots because there are too few planes in the air to create routine visual stimuli for an autopilot.<sup>147</sup> Autopilot systems may respond to wind and wildlife,<sup>148</sup> but these obstacles do not have a legal duty to act reasonably like other drivers do. Elevators also have no analogous case law, because they operate on a track in two directions without perceiving, or responding to, their environment.<sup>149</sup>

In contrast, case law for horse accidents is more analogous to autonomous vehicles, because horses interpret and respond to the actions of other drivers. In the early 1900s, cars and horses

---

<sup>144</sup> See LEE S. KREINDLER ET AL., 14 NEW YORK PRACTICE SERIES - NEW YORK LAW OF TORTS § 7:2 (regarding circumstances as a part of the reasonable person standard).

<sup>145</sup> See 4A FLA. JUR. 2D *Automobiles and Other Vehicles* § 694 (2017) (stating drivers have a duty not to frighten horses).

<sup>146</sup> See Boudette, *supra* note 52 (regarding an autonomous Tesla confused by the vehicle being the same color as the backdrop).

<sup>147</sup> See Webb, *supra* note 50, at 35 (“[T]here are far less planes in the sky than cars on the road[.]”)

<sup>148</sup> See Zohn, *supra* note 3, at 481 (“[A]utopilot in ships and airplanes are capable of handling unpredictable outside conditions such as wind, other boats and planes, or even wildlife.”).

<sup>149</sup> Webb, *supra* note 50, at 34–35.

frequently shared the road.<sup>150</sup> Horse riders and car drivers had equal rights to the road, which implied a reciprocal duty for drivers and horseback riders not to interfere with each other's rights to use the road safely and reasonably.<sup>151</sup> This meant car drivers had a duty to exhibit common sense knowledge of noises and maneuvers that may trigger erratic behavior in nearby horses.<sup>152</sup> For example, if a driver notices the car's approach is causing a horse to act erratically, the driver may have to slow down to prevent scaring the horse further with the vehicle, mitigating the risk.<sup>153</sup>

In *Branham*, a truck driver going less than 35 miles per hour and creating a regular amount of noise was not considered negligent for frightening a horse with the vehicle's approach, causing the horse to gallop into the highway.<sup>154</sup> There, the court said it is not negligent to engage in the ordinary lawful use of a vehicle and the driver had a right to presume the horse would act safely.<sup>155</sup> The horse's ears perking up was not enough to put the driver on notice that the truck was scaring the horse.<sup>156</sup> In contrast, in *McIntyre v. Orner*, a driver going only 15 mph near a horse-drawn carriage was liable for scaring the horses, causing the carriage to throw the passengers.<sup>157</sup> There, the driver failed to stop his car, even after seeing that it was frightening the horses.<sup>158</sup> The court said the driver should have known cars were "strange objects to horses" and could cause them to act erratically.<sup>159</sup>

This precedent offers a practical standard from which to evaluate the hypothetical discussed earlier in this section. To decide whether the driver of a black car with broken headlights was negligent by confusing an autonomous vehicle, the court would need to ask: (1) whether it was lawful or ordinary use; (2) whether a reasonable

---

<sup>150</sup> See generally *McIntyre v. Orner*, 166 Ind. 57 N.E. 750 (1906) (discussing cars and horses sharing the road).

<sup>151</sup> *Id.* at 752.

<sup>152</sup> *Id.*

<sup>153</sup> *Id.*

<sup>154</sup> *Alpha Constr. Co. v. Branham*, 337 S.W.2d 790, 791 (Ky. 1960).

<sup>155</sup> See *id.*

<sup>156</sup> See *id.*

<sup>157</sup> *McIntyre*, 166 Ind. at 57.

<sup>158</sup> *Id.* at 63.

<sup>159</sup> *Id.*

person would know a black car with no headlights may cause erratic behavior in autonomous vehicles; and (3) whether a reasonable driver would have noticed the effect their car was having on a neighboring autonomous vehicle and taken precautions to avoid the accident. Horses used to be quite common and their behaviors widely known. In contrast, the reasonable person may not know their behavior was likely to confuse an autonomous vehicle in a wider range of cases.

The autonomous vehicle accident in Florida helps illustrate this theory.<sup>160</sup> In the accident, a white truck against a bright sky confused the autonomous vehicle.<sup>161</sup> The truck driver was charged with a right of way traffic violation<sup>162</sup> but was not charged for negligently confusing the autonomous vehicle. Naturally, something that is as lawful and ordinary as driving a white truck in daylight would not be negligent under the horse analogy.

#### B. *Instrumentality of Harm*

Property owners are expected to use ordinary care in controlling who has access to their property.<sup>163</sup> Owners can be liable for negligence if they knew, or should have known, that giving their property to another would create an unreasonable risk of foreseeable injury due to the recipient's youth, inexperience, or other circumstances.<sup>164</sup> For example, loaning a car to an unlicensed or intoxicated driver is negligence per se, because lack of proper skill or competence to drive safely is presumed.<sup>165</sup>

---

<sup>160</sup> See NHTSA, DEFECTS INVESTIGATION, *supra* note 4.

<sup>161</sup> Boudette, *supra* note 52.

<sup>162</sup> Shepardson *supra* note 85 (“[T]ruck driver was charged with a right of way traffic violation.”).

<sup>163</sup> See H.D. Warren, Annotation, *Common-Law Liability on Entrusting Automobile to Incompetent, Reckless, or Unlicensed Driver*, 168 A.L.R. 1364 (1947).

<sup>164</sup> RESTATEMENT (SECOND) OF TORTS § 390 (AM. LAW INST.) (1965).

<sup>165</sup> Karen J. Ellmore, *Negligent Entrustment of Motor Vehicle to Unlicensed Driver*, 55 A.L.R.4th 1100 § 3(a) (1987) (discussing licenses); Frank J. Wozniak, Annotation, *Liability Based on Entrusting Automobile to One Who Is Intoxicated or Known to Be Excessive User of Intoxicants*, 91 A.L.R.5th 1 (2001) (discussing intoxication).

Pre-existing analogy theories cannot be sensibly applied to an owner of an autonomous vehicle that negligently provides access to another. Elevators are not easily moved, and airplanes are not typically borrowed without a formal contract distributing liability. The “reasonable car” theory analogizes autonomous vehicles with human beings,<sup>166</sup> but analogies comparing humans to machines are limited. Elevators and autopilot are both heavily regulated.<sup>167</sup> Therefore, it is often quite clear whether it is reasonable to grant access to an elevator or autopilot to others by looking for an appropriate license and compliance with various regulations.

The horse analogy theory leads to a more sensible application of the instrumentality of harm doctrine. Autonomous vehicles lack—for now—some of the detailed, explicit, and widely-known regulatory framework of traditional cars, elevators, or airplanes.<sup>168</sup> In most states, there is no licensing scheme an autonomous vehicle owner could rely on to verify a borrower of their vehicle knows how to use the autonomous features safely.<sup>169</sup> Many consumers are uncertain whether riding a horse or an autonomous vehicle while intoxicated would be considered against the law. The applicable law is often determined by a technical statutory interpretation of DUI laws, rather than by common law.<sup>170</sup>

---

<sup>166</sup> Webb, *supra* note 50, at 47.

<sup>167</sup> See, e.g., 50 N.Y. JUR. 2D *Elevators and Escalators* § 23 (discussing elevators); 11 N.Y. JUR. 2D *Boats, Ships, and Shipping* § 191 (discussing pilots).

<sup>168</sup> See NAT'L CONFERENCE OF STATE LEGISLATURES, *Autonomous Vehicles: Self-driving Vehicles Enacted Legislation*, <http://www.ncsl.org/research/transportation/autonomous-vehicles-self-driving-vehicles-enacted-legislation.aspx> (last updated Oct. 23, 2017) (showing state-level legislation focused on either autonomous vehicle testing or empowering regulatory agencies to develop substantive rules).

<sup>169</sup> John W. Terwilleger, *Navigating the Road Ahead: Florida's Autonomous Vehicle Statute & Its Effect on Liability*, 89 Fla. B.J. 26, 26 (2015) (stating that thus far, only Nevada and California have started passing legislation regarding special licensing for autonomous vehicles).

<sup>170</sup> See generally *Commonwealth v. Noel*, 579 Pa. 546, 549 (Pa. 2004) (holding that a statute against driving a “vehicle” while intoxicated was not applicable to horse-riding, since “vehicles” are defined as “devices” by statute); *State v. Williams*, 449 So. 2d 744, 746 (La. Ct. App. 1984), *writ denied*, 452 So. 2d 172 (La. 1984) (holding that a statute against driving a motor vehicle or other conveyance while intoxicated did not apply to horse-riding, because the statute

Instrumentality of harm case law for horse accidents is more analogous to the type of situations that may emerge with autonomous vehicles. Horse owners can be liable if they knew or should have known either (1) that the rider of the horse did not have the skills or knowledge to ride safely, or (2) that the horse had particular “vicious or violent” propensities.<sup>171</sup> If a rider tells the owner of a horse the rider has “some” experience, the owner may rely on this statement and be absolved of liability.<sup>172</sup> A “vicious or violent” horse is one having a propensity (not a mere potential) to “endanger the safety of the persons and property of others.”<sup>173</sup> If the owner warns a rider of the horse’s dangerous tendencies, and the person borrowing the horse rides anyway, the rider may be contributorily negligent or have assumed the risk.<sup>174</sup> Even a single incident where a horse acted erratically could be enough to put the owner on notice of its dangerous propensity and impose a duty to warn future users of the property about the danger.<sup>175</sup>

In *Macho v. Mahowald*, a single incident where a horse bolted towards an alfalfa patch was enough to raise a jury question as to whether the owner was on notice of the horse’s dangerous propensity.<sup>176</sup> There, the owner offered an acquaintance a ride on his daughter’s horse, without providing any warnings about the horse bolting for an alfalfa patch, as it had on a prior occasion.<sup>177</sup> Once the acquaintance was on the horse, it once again bolted towards the

---

was intended to cover inanimate vehicles); Katherine L. Hanna, *Old Laws, New Tricks: Drunk Driving & Autonomous Vehicles*, 55 *Jurimetrics J.* 275 (2015).

<sup>171</sup> See *Macho v. Mahowald*, 374 N.W.2d 312 (Minn. Ct. App. 1985); 3A OHIO JUR. 3D *Animals* § 48 (2017); 3 N.Y. JUR. 2D *Animals* § 185 (2017); 13 AM. JUR. PROOF OF FACTS 2D 473 *Knowledge of Animal’s Vicious Propensities* § 6 (1977).

<sup>172</sup> See *Stoffels v. Harmony Hill Farm*, 389 N.J. Super. 207, 912 A.2d 184 (N.J. Super. Ct. App. Div. 2006); *Wickoren v. Diamond T Ranch*, 1993 WL 173862, at 2 (Minn. Ct. App. 1993).

<sup>173</sup> *Macho*, 374 N.W.2d at 315.

<sup>174</sup> *Pitcher*, *supra* note 172, at § 6.

<sup>175</sup> *Macho*, 374 N.W.2d at 315; *Pitcher*, *supra* note 172, at § 6 (“The law does not require “any particular number of instances of unprovoked attack or injury to show a vicious disposition in an animal, and the jury may draw such inferences from a single act, especially if it be an attack upon a person.”) (citations omitted).

<sup>176</sup> *Macho*, 374 N.W.2d at 313–14.

<sup>177</sup> *Id.*

alfalfa patch, throwing the rider against a tree in the process.<sup>178</sup> In *State Farm v. Shoaf*, the owner of a horse was liable for negligence when he handed over the reins to an inexperienced rider near a busy street.<sup>179</sup> There, the owner's knowledge of the rider's lack of experience, and of the particular dangers of their surroundings resulted in a finding of negligence on the part of the owner.<sup>180</sup>

A hypothetical can illustrate how this case law could apply to autonomous vehicle owners that negligently provide their vehicle to another. Consider a situation in which someone loans a car they own to a friend, who has no experience using autonomous vehicles. The friend drives manually to get to the freeway, then initiates the self-driving features near the end of the onramp. However, the friend did not realize the autonomous features will not engage until the GPS recognizes the car as being completely on the freeway, and it did not actually activate on the onramp. The friend stops holding the wheel and promptly crashes the vehicle. Here, the owner could be contributorily negligent for providing the instrumentality of harm to an inexperienced driver, without any warnings or instruction.

### C. Assumption of the Risk

A user of a product assumes the risk if the user subjectively knew and appreciated the danger of an activity but voluntarily chose to continue in spite of the danger.<sup>181</sup> The most important element of an assumption of the risk defense is that the user of the product had actual, subjective knowledge of the risks and their magnitude, with some degree of specificity.<sup>182</sup> While the gravity of risk must be known, the specific manner of injury does not.<sup>183</sup> Subjective

---

<sup>178</sup> *Id.*

<sup>179</sup> *State Farm Mut. Auto. Ins. Co. v. Shoaf*, 446 N.E.2d 824, 827 (Ohio Ct. App. 1982).

<sup>180</sup> *Id.*

<sup>181</sup> *Yamaha Motor Corp. v. McTaggart*, 720 S.E.2d 217, 219 (Ga. Ct. App. 2011); *Teems v. Bates*, 684 S.E.2d 662, 666 (Ga. Ct. App. 2009).

<sup>182</sup> *Harrold v. Rolling J Ranch*, 7 Cal. App. 4th 81, 86 (1993) (discussing gravity of harm); 119 AM. JUR. PROOF OF FACTS 3D 203 *Assumption of Risk as Defense to Strict Products Liability Action* § 7 (2011).

<sup>183</sup> AM. JUR. PROOF OF FACTS 3D, *supra* note 183, at § 7.

knowledge may be implied by circumstantial evidence, such as the user's skill or expertise related to the activity.<sup>184</sup>

Users of a product may have assumed the risk if they used a product in an unintended or unforeseeable manner.<sup>185</sup> They also assume risks they acknowledge are inherent in an imperfect product but pose no special dangers.<sup>186</sup> Drivers can assume the risk when they continue using a vehicle after a dangerous defect becomes known or the risks are disclosed to them.<sup>187</sup> For example, passengers can assume the risk when they notice the driver is acting erratically, but do nothing to mitigate the danger.<sup>188</sup> Someone that continues driving despite knowledge of the dangerous condition of the vehicle is negligent for disregarding the danger.<sup>189</sup>

Assumption of the risk case law for horse accidents focuses on the behavior and mannerisms of the horse. Horseback riders assume the risk a particular horse may not have an "ideal" mannerism.<sup>190</sup> They assume risks inherent in horseback riding, such as being thrown from the horse.<sup>191</sup> However, riders do not assume the risk a horse has particular "vicious propensities" unless they had actual or constructive knowledge of the special danger.<sup>192</sup> Riders that continue riding their horse despite knowledge of its dangerous propensity may assume the risk.<sup>193</sup>

---

<sup>184</sup> Smith v. Hunting View Farm, 265 A.D.2d 928, 695 N.Y.S.2d 802 (1999).

<sup>185</sup> AM. JUR. PROOF OF FACTS 3D, *supra* note 183, at § 2.

<sup>186</sup> Jeremy Levy, *No Need to Reinvent the Wheel: Why Existing Liability Law Does Not Need to Be Preemptively Altered to Cope with the Debut of the Driverless Car*, 9 J. BUS. ENTREPRENEURSHIP & L. 355, 383 (2016).

<sup>187</sup> AM. JUR. PROOF OF FACTS 3D, *supra* note 183, at § 2.

<sup>188</sup> Eleanor L. Grossman, et al., *Passenger's Acquiescence in Driver's Conduct as Assumption of Risk*, 8 Ohio Jur. 3d Automobiles and Other Vehicles § 580 (2017).

<sup>189</sup> 31 AM. JUR. PROOF OF FACTS 2D 639 *Dealer's Liability for Defective Used Car* § 14 (2017); 8B N.Y. JUR. 2D AUTOMOBILES *Falling Asleep* § 1030 (2017).

<sup>190</sup> *Equestrian Activities* 6, WITKIN, SUMMARY 11TH TORTS § 1504(4)(a) (2017).

<sup>191</sup> *Id.*

<sup>192</sup> *Defense of Contributory Negligence or Implied Assumption of Risk in Mitigation of Liability*, 2 NY EV. PROOF OF CASES § 16:9.

<sup>193</sup> See *Alpha Constr. Co. v. Branham*, 337 S.W.2d 790 (Ky. 1960).

In comparison to horses, the more predictable and safer nature of autonomous vehicles may create a narrower scope of assumed risks. Horses may “buck, run, kick, bite, run, and bolt uncontrollably . . . without warning and without apparent cause.”<sup>194</sup> Riding horseback is more dangerous than driving a motorcycle or skiing.<sup>195</sup> If an autonomous vehicle acted similarly to the horse in *Hunting View Farm* and randomly reversed into someone’s shin, the user probably would not be seen as having assumed the risk, because more predictable behavior is expected of an autonomous vehicle.

However, overall horse case law offers a more sensible analogy to autonomous vehicles. Users of an autonomous vehicle may assume the risk of an imperfect product and may assume the risk when misusing the vehicle. Manufacturers may be liable when an autonomous vehicle product has a particular dangerous propensity that goes beyond the risks a consumer consents to by using the product. However, users may be liable if they knew of a dangerous defect and did nothing to avert the danger. Manufacturers can reduce their liability exposure by ensuring drivers have subjective knowledge of the risks, such as by disclosing them in the owner’s manual<sup>196</sup> and in an express waiver.<sup>197</sup>

This application of the assumption of risk doctrine is aligned with the Department of Transportation’s report on the fatal autonomous vehicle accident in Florida in which an autonomous vehicle collided with a truck in an intersection.<sup>198</sup> There, the driver was using the vehicle’s autonomous features on “city streets” even though they were only intended for highway use.<sup>199</sup> Such misuse of the product could constitute an assumption of the risk. Additionally, the vehicle’s owner’s manual gave the owner knowledge of the risk

---

<sup>194</sup> *Cohen v. Five Brooks Stable*, 72 Cal. Rptr. 3d 471, 479 (Cal. Ct. App. 2008).

<sup>195</sup> Thompson, *supra* note 137, at 561 (proposing that horseback riding is more dangerous than riding a motorcycle, skiing, or playing football).

<sup>196</sup> See NHTSA, DEFECTS INVESTIGATION, *supra* note 4.

<sup>197</sup> Marchant & Lindor, *supra* note 35, at 1321, 1336.

<sup>198</sup> See NHTSA, DEFECTS INVESTIGATION, *supra* note 4.

<sup>199</sup> See *id.* at 4 (“The Tesla Model S owner’s manual states that TACC ‘is primarily intended for driving on dry, straight roads, such as highways and freeways. It should not be used on city streets.’”).

that the system will not perform well in specific crash scenarios.<sup>200</sup> The car's repeated warnings to the driver<sup>201</sup> arguably gave the driver subjective knowledge of the dangers of failing to maintain vigilance over the car's operations.<sup>202</sup> While the vehicle could not accurately interpret the white truck against a bright sky,<sup>203</sup> the driver had subjective knowledge of the risks that he assumed through his continued use of the product.

Consumers assume the risks they know are an inherent part of using an imperfect product, but cannot consent to dangers that are unreasonable or unknown to them. Defects in autonomous vehicles will likely cause manufacturer liability, but autonomous vehicles operating within their disclosed limits of performance should not.

#### D. *Product Liability*

Generally, manufacturers can be strictly liable for their products under three possible doctrines: manufacturing defect, design defect, and warning defect.<sup>204</sup> Manufacturing defects are rare in the modern era because modern manufacturing and software are usually mass-produced in a manner that is consistent with design specifications.<sup>205</sup> A design defect occurs when a product is unreasonably dangerous and a reasonable safer alternative design would have mitigated the risk of harm.<sup>206</sup> A warning defect occurs when a potentially dangerous product is negligently produced and sold without adequate instructions or warnings necessary to make the product safer or to warn the consumer of foreseeable risks.<sup>207</sup> Manufacturers do not have a duty to equip the most optimal warnings possible, but can be liable for using a light on the dash, rather than a more

---

<sup>200</sup> See *id.* at 8.

<sup>201</sup> See Shepardson, *supra* note 85.

<sup>202</sup> Riehl, *supra* note 31, at 28.

<sup>203</sup> Boudette, *supra* note 52.

<sup>204</sup> Kim D. Larsen, Note, *Strict Products Liability and the Risk-utility Test for Design Defect: An Economic Analysis*, 84 COLUM. L. REV. 2045, 2045 (1984); Webb, *supra* note 50, at 23.

<sup>205</sup> See generally Larsen, *supra* note 204; Webb, *supra* note 50, at 20; Zohn, *supra* note 3, at 474.

<sup>206</sup> Webb, *supra* note 50, at 28.

<sup>207</sup> Larsen, *supra* note 204, at 2046–47.

effective audio alert.<sup>208</sup> Generally, more specific warnings are less likely to result in liability than generalized warnings that may be difficult to interpret.<sup>209</sup>

The horse analogy fails when it comes to design and warning defects. Strict product liability only applies to products that are fixed in their nature, whereas a horse's behavior may change based on its treatment by the owner.<sup>210</sup> Additionally, horses are not mass manufactured with precision in a manner that rarely leads the horse to deviate from a design.<sup>211</sup> Here, it matters that horses are blood and bone, whereas autonomous vehicles are steel and computer boards. However, design defects in autonomous vehicles require no analogy or breakthrough in legal analysis. They place no special burden on basic principles of product liability.<sup>212</sup> Autonomous vehicle design defects will most likely be analyzed under the same risk-utility analysis as any other product.<sup>213</sup> The Restatement of Torts includes a seven-factor test for product liability.<sup>214</sup>

Despite the common prediction that autonomous vehicles will represent a dramatic shift towards manufacturer liability,<sup>215</sup> the factors lean in favor of only mild liability for manufacturers. For example, the benefits of the product to society is quite significant

---

<sup>208</sup> James Forrest McKell Jr., *Chatter, Clatter, and Blinks: Defective Car Alerts and the Role of Technological Advances in Design Defect/Failure to Warn Cases*, 2010 DUKE L. & TECH. REV. 10, 11–12 (2010).

<sup>209</sup> *Id.* at 13.

<sup>210</sup> See Christopher H. Hall, Annotation, *Live Animal as "Product" for Purposes of Strict Products Liability*, 63 A.L.R.4th 127 § 2 (1988).

<sup>211</sup> See Marchant & Lindor, *supra* note 35, at 1323.

<sup>212</sup> See generally Levy, *supra* note 186 (arguing that autonomous vehicles do not strain pre-existing product liability concepts); David C. Vladeck, *Machines Without Principals: Liability Rules & Artificial Intelligence*, 89 WASH. L. REV. 117, 142 (2014).

<sup>213</sup> See generally Levy, *supra* note 186; Vladeck, *supra* note 212.

<sup>214</sup> Matthew Blunt, *Highway to a Headache: Is Tort-based Automotive Insurance on a Collision Course with Autonomous Vehicles?*, 53 WILLAMETTE L. REV. 107, 126–27 (2017) (“[C]ourts typically rely on a set of seven factors proposed . . . in the Second Restatement of Torts[.]”).

<sup>215</sup> See, e.g., Riehl, *supra* note 31, at 25 (“The advent of autonomous vehicles points to a seemingly inescapable shift in historical standards for auto crashes—from driver/owner liability to a product liability regime.”).

for autonomous vehicles,<sup>216</sup> which are offering a safer alternative to human drivers.<sup>217</sup> Users of an autonomous vehicle can reduce their exposure to the risks of the product by taking control of the vehicle when a crash is imminent.<sup>218</sup> Users should be aware of the dangers of the product because those dangers have been widely publicized<sup>219</sup> and may also be in the owner's manual<sup>220</sup> or elsewhere.

While the horse analogy is not sensible for product liability, a design defect analysis does not imply a need for novel analysis or analogy. Manufacturers can reduce their liability in the usual ways, by educating users on the risks, making products that benefit society, equipping users to reduce their own risks, and creating the safest product reasonably possible. Manufacturers will not be liable merely for an imperfect product, but may be if their product is especially dangerous such that the manufacturer was negligent.

#### IV. CONCLUSION

Horses and autonomous vehicles have more in common than meets the eye. Both are autonomous property that can perceive their environment, misinterpret the dangers around them, and engage in maneuvers the owner would not have authorized. As a result, many accidents on horses and foreseeable situations for autonomous vehicle accidents have many analogous facts and elicit similar legal principles.

The precedent for horse accidents presents a stronger comparison than pre-existing analogy theories for elevators, autopilot systems, or humans. Elevators carry no expectation of

---

<sup>216</sup> See Thierer & Hagemann, *supra* note 23, at 340.

<sup>217</sup> See e.g., Kalra & Paddock, *supra* note 138.

<sup>218</sup> Endsley, *supra* note 74.

<sup>219</sup> See, e.g., Matthew DeBord, *The 3 Biggest Risks Facing Self-driving Cars*, BUSINESS INSIDER (Jun. 19, 2017, 10:55 AM), <http://www.businessinsider.com/self-driving-cars-risks-2017-6> (last visited Oct 30, 2017); Shepardson, *supra* note 85; Douglas Rushkoff, *Tesla Crash Highlights Real Problem Behind Self-driving Cars*, CNN (updated July 1, 2016, 8:06 PM), <http://www.cnn.com/2016/07/01/opinions/tesla-self-driving-car-fatality-rushkoff/index.html> (last visited Oct 30, 2017).

<sup>220</sup> See NHTSA, DEFECTS INVESTIGATION, *supra* note 4 (stating that the owner's manual warns the car cannot safely guard against certain crash scenarios).

oversight from its users, while autopilot systems expect professional, licensed oversight. Analogizing autonomous vehicles to human drivers is a novel legal doctrine because the reasonable person standard has never been applied to property. These analogies often become an awkward fit when considering complex real-world scenarios, such as loaning the car to another or other negligent drivers on the road.

The horse analogy is more sensible for most situations. Horses and autonomous vehicles both perceive and interpret their environment, and they sometimes make dangerous maneuvers when they misunderstand their surroundings. They are both affected by the actions of other people on the road. Horses and autonomous vehicles are both property, owned and operated by regular consumers, that can be borrowed by a friend or used by another.

Common law rules for product liability and negligence vary from state to state. The future will likely include variations in autonomous vehicle liability that will develop incrementally through the common law process. However, this Recent Development proposes an analogy to forecast liability rules in autonomous vehicle accidents. It illustrates why autonomous vehicles will not introduce immense liability exposure to manufacturers. Rather liability will continue to be imparted where it is due, based on the party whose negligence caused the accident.