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# Sit, Stay, Drive: The Future of Autonomous Car Liability

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# Sit, Stay, Drive: The Future of Autonomous Car Liability

Sophia H. Duffy\*  
Jamie Patrick Hopkins\*\*

## ABSTRACT

*Driverless cars have made the jump from fantasy to the physical realm. Technology has evolved to the point where autonomous cars will be a common sight in the very near future. The benefits of autonomous cars are plentiful: increased safety for car passengers, who no longer have to fear drunk, reckless, or distracted drivers, increased productivity for passengers who can use the travel time to accomplish tasks, decreased reliance on fuel as the cars often incorporate solar panels and automatically adjust speed to maximize fuel efficiency, and decreased traffic congestion as the cars can identify upcoming trouble spots and take alternate routes to avoid delay. However, this innovative technology brings with it an unaddressed legal issue: how will legal liability be assessed when these cars collide with other cars, pedestrians, or property? Current law surrounding liability for automobile accidents largely bases liability on the actions of the driver. Similarly, looking to the liability law governing computers does not address the issue either, as the laws base liability on the actions of the operator of the computer system, and the scant laws related to autonomous computer systems apply only to commercial transactions. This article proposes that the solution to this legal issue lies in treating autonomous cars like man's best friend, the dog. Dogs and computers are both treated as chattel under tort law, and are similar in that they can act independently, yet are considered property of another. The laws governing canine ownership show that applying strict liability to autonomous car owners accomplishes the dual purpose of fairly assessing liability without hampering the widespread adoption of this marvelous technology.*

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## I. INTRODUCTION

Decades ago, unmanned vehicles and driverless cars were only a dream of a distant future.<sup>1</sup> If you look outside you might not see them, but autonomous cars are no longer a science fiction fantasy. Autonomous cars are currently developed and utilized around the world.<sup>2</sup> In 2012, Nevada became the first state in the United States to issue a license to operate a driverless car.<sup>3</sup> Internet-giant Google uses autonomous “Street View” vans to take satellite images of the surrounding environment for use in its Google Maps<sup>4</sup> web mapping service application and technology.<sup>5</sup> Italy’s VisLab, which has spent the past two decades developing driverless vehicles,<sup>6</sup> successfully sent two driverless vans on an eight thousand mile test drive from Rome, Italy, to Shanghai, China.<sup>7</sup> Carmaker Audi sent its newly developed autonomous car on the infamously challenging Pike’s Peak Hillclimb race.<sup>8</sup>

As autonomous cars become increasingly prevalent, the risk and likelihood of collision with other vehicles rises.<sup>9</sup> This poses a problem for lawmakers, police, and insurance companies because current state laws con-

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1. See Shrinivas Kirade, *Driverless Car*, BUZZLE, <http://www.buzzle.com/articles/driverless-car.html> (last updated Sept. 28, 2011) (describing the driverless car exhibited at the 1933 World Fair in Chicago, Illinois, in an exhibit by General Motors called ‘Futurama,’ which depicted everyday life thirty years in the future).
2. CNN Wire Staff, *Google Gets License to Operate Driverless Cars in Nevada*, CNN, <http://www.cnn.com/2012/05/07/tech/nevada-driveless-car> (last updated May 8, 2012).
3. *Id.*
4. See *Google Maps/Earth Additional Terms of Service*, GOOGLE [http://www.google.com/intl/en\\_us/help/terms\\_maps.html](http://www.google.com/intl/en_us/help/terms_maps.html) (last modified Mar. 1, 2012).
5. Sebastian Thrun, *What We’re Driving At*, OFFICIAL GOOGLE BLOG (Oct. 9, 2010, 12:00 PM), <http://googleblog.blogspot.com/search?updated-max=2010-10-14T09:43:00-07:00&max-results=10> (revealing that the Street View vans used in California are autonomous).
6. *All Things Considered: A Driverless Car Race From Rome to Shanghai*, NPR (July 22, 2010), <http://www.npr.org/templates/story/story.php?storyId=128699923> [hereinafter *Driverless Car Race Recording*].
7. *About VIAC*, VISLAB INTERCONTINENTAL AUTONOMOUS CHALLENGE, <http://viac.vislab.it/> (last visited Nov. 25, 2013) (announcing that the two autonomous vehicles completed the trip on Oct. 28, 2010).
8. David Williams, *Audi’s Driverless Car Goes Racing*, TELEGRAPH (Dec. 1, 2009), <http://www.telegraph.co.uk/motoring/news/6693453/Audis-driverless-car-goes-racing.html> (stating that the race consists of “13 twisting miles” on Pikes Peak located near Colorado Springs, Colorado).
9. See Helen Popkin, *Google Self-Driving Car Crash Caused by Human*, NBC NEWS (Aug. 8, 2011, 1:22 PM), <http://www.nbcnews.com/technology/google-self-driving-car-crash-caused-human-121531> (noting Google’s autonomous car

cerning automobile accident liability assume a human driver.<sup>10</sup> Since autonomous car technology is relatively new, and yet to be widely utilized, existing laws do not directly address the determination of liability in a collision involving an autonomous car.<sup>11</sup> Although existing vehicle and computer laws contain some legal tenants that can be applied to autonomous cars, they do not provide courts with a comprehensive body of law to determine and assess liability.<sup>12</sup> However, a possible solution to this void might be to model laws for autonomous cars after corollary laws for canine ownership. Examination of canine ownership laws demonstrates that strict liability is a practical and effective liability model that would similarly apply to autonomous car owners.

Autonomous cars are a hybrid between vehicles and computers as they are operated by a complex computer system consisting of cameras, laser sensors, GPS software, and a multitude of other mechanisms that create a 3-D image of the world around the vehicle.<sup>13</sup> The computer system navigates the vehicle through its environment without human involvement.<sup>14</sup> For example, the vehicle immediately stops moving when frontal sensors detect an obstacle in the car's path, such as a pedestrian.<sup>15</sup> The computer system also adjusts the car's speed, gear, and route in response to road conditions, such as potholes and changes in land slope, when detected by the sensors and cam-

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drove over 160,000 miles without an accident and that the recent accident was caused by a human when operating the car manually).

10. See, e.g., 7A AM. JUR. 2D *Automobiles* § 112 (2010) (describing a *person's* qualifications for licensing drivers of motor vehicles).
11. See Gary E. Marchant & Rachel A. Lindor, *The Coming Collision Between Autonomous Vehicles and the Liability System*, 52 SANTA CLARA L. REV. 1321, 1322 (2012) (noting the potential problems with and unsettled nature of liability for autonomous vehicles).
12. See generally *id.*
13. *Driverless Car Race Recording*, *supra* note 6; *Italian Autonomous Car to Drive from Italy to China*, DEUTSCHE WELLE, (July 23, 2010), <http://www.dw.de/italian-autonomous-car-to-drive-from-italy-to-china/a-5829135-1>; see also Thrun, *supra* note 5 (describing autonomous cars and the technology incorporated into the vehicles).
14. See Thrun, *supra* note 5 (describing Street View vans that have no human driver); *Driverless Car Race Recording*, *supra* note 6 (describing the vans as "two, solar-powered, electric vehicles operating autonomously—that is, they have no drivers").
15. Sylvia Marchetti, *Italy's "Green," Driverless Cars on Modern "Silk Road" to China*, PHIL. NEWS AGENCY, (July 23, 2010), <http://balita.ph/2010/07/23/italys-green-driverless-cars-on-modern-silk-road-to-china/> (citing an incident where a reporter in Milan, Italy, tested the vehicle's pedestrian sensors by launching himself in front of the car, which halted immediately).

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eras on the vehicle.<sup>16</sup> Upon input of a destination, a satellite-GPS program directs the vehicle to its destination.<sup>17</sup> Autonomous cars can, by definition, literally drive themselves with little to no human interaction.

Their safety and efficiency could mean that the “family car” will soon be autonomous.<sup>18</sup> However, autonomous cars also pose a grave risk to the general public. Serious accidents could be caused by glitches, viruses, network failures, and programming errors that commonly afflict computer-run devices.<sup>19</sup> This danger is very real; car manufacturer Toyota recently settled a class action lawsuit stemming from personal injuries and property damages caused by the malfunction of autonomous acceleration systems in certain models that caused the cars to rapidly and uncontrollably accelerate and crash.<sup>20</sup> While these cars were not completely autonomous, these lawsuits serve as a harbinger of the types of computer problems and injuries that can occur with autonomous cars.

This article will discuss the current theories of assessing liability for automobile accidents and computer use, and highlight how these bodies of law contain some aspects that are applicable to autonomous cars but fail to comprehensively address how to assess liability for a collision. Strict liability laws governing canine ownership will be discussed, particularly how these laws can serve as a model for developing law that addresses autonomous vehicles. The discussion section will articulate why canine ownership liability is a good model to utilize and will demonstrate how strict liability can be successfully applied to autonomous car owners.

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16. *Id.*

17. *Vehicles Behavior*, VISLAB INTERCONTINENTAL AUTONOMOUS CHALLENGE, [http://viac.vislab.it/?page\\_id=592](http://viac.vislab.it/?page_id=592) (last visited Oct. 25, 2013) (describing the GPS “localization unit”).

18. Susan Kuchkinskas, *The Autonomous Car: The Road to Driverless Driving*, TELEMATICS MUNICH (May 30, 2013) <http://analysis.telematicsupdate.com/v2x-safety/autonomous-car-road-driverless-driving>.

19. The scope of this paper will not discuss or focus on products liability claims that may also arise against manufacturers, programmers, and retailers of these autonomous cars.

20. *Toyota Seeks to Dismiss Acceleration Lawsuits*, CBS NEWS Nov. 19, 2010, available at <http://www.cbsnews.com/news/toyota-seeks-to-dismiss-acceleration-lawsuits/>; see also Greg Risling, *Toyota Settles Many Sudden-Acceleration Lawsuits*, USA TODAY Jan. 21, 2013, available at <http://www.usatoday.com/story/money/cars/driveon/2013/01/21/toyota-sudden-acceleration-lawsuits/1851813/> (stating Toyota settled a class action suit regarding automatic acceleration concerns in its vehicles but notes legal challenges are not over as Toyota will likely still end up in court over the issue).

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## II. OVERVIEW OF EXISTING LAW

While some states have passed legislation regulating the use of autonomous cars, these laws do not address liability concerns but merely licensing, use, and regulation issues.<sup>21</sup> Consequently, there is no body of law that directly addresses the liability for autonomous cars. This section provides an overview of existing laws relating to automobile accidents and computer use. This overview will illustrate that, while these areas may seem like the most likely corollaries for dealing with autonomous cars, they are inadequate to handle the full scope of autonomous car liability issues. After discussing current automobile accident and computer use liability and the deficiencies in these bodies of law in regards to autonomous cars, this section will investigate canine ownership laws.

### A. Automobile Accident Liability

There are three different situations for assessing automobile accident liability: driver liability; runaway cars; and defective vehicles. Driver liability is relatively straightforward and requires little explanation: driver is liable for his own actions in causing an accident, such as negligent or reckless operation of the vehicle.<sup>22</sup> Driving on the wrong side of the road, speeding, or disobeying traffic signals can constitute negligent or reckless operation of a vehicle.<sup>23</sup> Many states have enacted statutes that impute the driver's liability to the vehicle owner, if the vehicle's owner had granted permission.<sup>24</sup> However, states will not typically impute a degree of liability greater than negligence on the owner of a vehicle, regardless of the driver's liability.<sup>25</sup> The imputed liability statute purposely holds the vehicle owner accountable for

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21. See CAL. VEH. CODE § 38750 (West 2013) (setting forth California's law governing autonomous vehicle use).
22. See, e.g., RESTATEMENT (SECOND) OF TORTS §§ 282 cmt. e, 283 cmt. e (1965) (suggesting a defendant driver's duty includes protection from harm "normally expected as a consequence of the negligent driving").
23. C.T. Drescher, Annotation, *Custom or Practice of Drivers of Motor Vehicles as Affecting Question of Negligence*, 77 A.L.R. 2d. 1327 (1961).
24. See generally RESTATEMENT (SECOND) OF TORTS § 485 cmt. d (1977) (stating that in some jurisdictions, the vehicle owner is vicariously liable for the negligence of the person operating the vehicle); see also *DuBois v. Rose*, 576 N.E.2d 1104, 1108 (Ill. App. Ct. 1991) (discussing methods of imputing a driver's negligence to a vehicle owner); *Ulrigg v. Jones*, 907 P.2d 937, 940–41 (Mont. 1995) (discussing state statutes of imposing a driver's liability on the vehicle owner).
25. See, e.g., *Berry v. Kipf*, 407 N.W.2d 648, 649 (Mich. 1987) (refusing to impute the driver's intentional tort liability upon the vehicle owner); *Gimenez v. Rissen*, 55 P.2d 292, 296 (Cal. Ct. App. 1936) (same); *White v. Center*, 254 N.W. 90, 94 (Iowa 1934) (finding owner liable for negligence when the driver was found reckless).

ensuring a responsible driver operates the car<sup>26</sup> and secures a financial recourse for any injured party, presumably the vehicle owner.<sup>27</sup>

A small body of case law addresses runaway cars. A human driver does not operate a runaway car, such as an empty car that rolls down a hill. In runaway car cases, courts have based liability on the actions of the person responsible for operating and maintaining the vehicle. In *Czelzewicz v. Turansky*, the defendant was found negligent for failing to properly apply the parking brake and liable for damage caused when the unoccupied vehicle rolled down a hill and struck another vehicle.<sup>28</sup> Some courts impute the operator's liability to the vehicle's owner the harm that the runaway car caused could have been reasonably foreseen.<sup>29</sup> In *Allcity Insurance Co. v. Old Greenwich Delicatessen*, the court found that car wash attendants were negligent by failing to control the vehicle as it rolled down a ramp unattended and struck another vehicle.<sup>30</sup> The court then applied the state's imputed liability statute and held the vehicle owner liable for the carwash attendants' negligence because the vehicle owner could have expected that type of harm to occur.<sup>31</sup>

In *Flood v. Travelers Village Garage, Inc.*, a New York court imposed liability on a parking garage employee when he stopped a car on a sharp incline, stepped out to open a gate, and the car rolled backwards down the incline hitting the plaintiff.<sup>32</sup> The court held that the employee was liable because he failed to provide any "blockage against gravity;" such blockage would be "to set the brake and turn off the ignition and turn the front wheels

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26. *Weber v. Pinyan*, 70 P.2d 183, 185 (Cal. 1937) (" . . . [T]he imputed negligence act was designed to place upon the owner of a motor vehicle liability for injuries in its operation by another with his permission, express or implied, and thus hold the owner answerable for his failure to place the instrumentality in proper hands . . . .").
  27. *Griffin v. La*, 645 N.Y.S.2d 528, 529 (N.Y. App. Div. 1996) ("This [statute] was enacted to ensure access by an injured party to a financially responsible defendant . . . . An attempt by a vehicle owner to avoid all liability is . . . void [against] . . . public policy.").
  28. *Czelzewicz v. Turansky*, 258 A.2d 555, 557-58 (Conn. App. Cir. 1969) ("Upon the subordinate facts found, there was ample basis for a conclusion that the defendant's conduct constituted negligence which was the proximate cause of the collision.").
  29. *See generally*, *Allcity Ins. Co. v. Old Greenwich Delicatessen*, 349 N.Y.S.2d 240, 242 (N.Y. Civ. Ct. 1973).
  30. *Id.* at 242 ("[T]he vehicle would not have run away had the car wash, through its employees, kept it under control as they were duty-bound to do under the laws of this state").
  31. *Id.* (imputing liability to the vehicle's owner).
  32. *Flood v. Travelers Village Garage, Inc.*, 411 N.Y.S.2d 324, 324 (N.Y. App. Div. 1978).

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to the curb.”<sup>33</sup> The court also noted that liability was warranted because it was reasonably foreseeable that the gearbox would fail and that gravity would cause the car to roll backwards.<sup>34</sup>

If an accident is caused by a defect in the car, the owner may be held liable.<sup>35</sup> For instance, a gratuitous bailment occurs when a vehicle owner loans the car to another driver without receiving a benefit.<sup>36</sup> A vehicle owner has a duty to disclose any known defects to foreseeable users and victims.<sup>37</sup> Therefore, the vehicle owner is liable for harm caused by defects of which he had “actual knowledge.”<sup>38</sup> This liability does not extend to defects the owner should have discovered through reasonable inspection or “constructive knowledge.”<sup>39</sup> If a car is so defective as to be uncontrollable, the courts may determine that the car was a “dangerous instrumentality.”<sup>40</sup> In most jurisdictions, if the court rules the car was a dangerous instrumentality, the owner’s liability is determined by the same “actual knowledge” standard as that of

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33. *Id.* at 325.

34. *See id.* (imposing liability when precautions were not taken against reasonably foreseeable mechanical car malfunctions).

35. *See, e.g.*, Charles S. Parnell, Annotation, *Liability of Bailor of Automotive Vehicle or Machine for Personal Injury or Death Due to Defects Therein*, 46 A.L.R. 2d 404 (1956) (stating that owners of vehicles lent to drivers are generally only liable for injury to the driver or third party if the owner knew at the time of lending the vehicle that the vehicle had a defect and failed to disclose the defect to the driver).

36. *See, e.g.*, 8A AM. JUR. 2D *Bailments* § 99 (2009) (stating that generally, a gratuitous bailor is not liable for injuries caused by defects if bailor has no actual knowledge); *but see* Flaherty v. Helfont, 122 A.180, 181 (Me. 1923) (surmising that an automobile may become a dangerous instrumentality even though the defect was latent).

37. RESTATEMENT (SECOND) OF TORTS § 388 cmt. g (1977) (stating that a vehicle owner’s duty is to exercise reasonable care to disclose information the owner possesses); *see also* Pfeifer v. Canyon Constr. Co., 628 N.E.2d 746, 750 (Ill. App. Ct. 1993) (finding that a vehicle owner’s actual knowledge can be established by circumstantial evidence).

38. *See Pfeifer*, 628 N.E.2d at 720. For automobile collisions caused by unknown defects, products liability will most likely be the predominant issue in the litigation.

39. *Dore v. Hartford Accident & Indem. Co.*, 180 So. 2d 434, 436 (La. Ct. App. 1965) (declining to extend a vehicle owner’s duty to include constructive knowledge).

40. *Collette v. Page*, 114 A. 136, 137 (R.I. 1921) (finding that a car becomes a dangerous instrumentality if the car becomes uncontrollable); *Texas Co. v. Veloz*, 162 S.W. 377, 379 (Tex. Civ. App. 1913) (finding a car in a state of bad repair can be found inherently dangerous).



regular vehicles.<sup>41</sup> In a minority of jurisdictions a higher standard of strict liability is imposed for owners of dangerous instrumentalities.<sup>42</sup> Strict liability statutes are enacted to ensure that the owner is held accountable for the safe use of his vehicle.<sup>43</sup> In these jurisdictions, the owner is liable for the damage in the automobile collision—even if the owner had no prior knowledge of the defect.<sup>44</sup>

If an autonomous vehicle behaved erratically due to a virus or glitch, it would inherently be “uncontrollable” since there is not a driver to control the vehicle. Even with an emergency override switch, a person would have to be present in the car in order to activate the switch. While California currently requires a human passenger,<sup>45</sup> it is not unconceivable to imagine that autonomous cars will eventually drive without human passengers. For example, if an unoccupied autonomous car were driving to pick up a family member, the override switch could not be activated in an emergency. An uncontrollable car could, therefore, be considered a dangerous instrumentality and consequently impose strict liability standards. However, since imposing strict liability for dangerous instrumentalities has only been adopted in a minority of jurisdictions, state legislatures are not likely to embrace such a wide expansion of this doctrine to encompass autonomous cars.<sup>46</sup>

An automobile owner may avoid liability if the victim was also liable in causing the accident in some manner.<sup>47</sup> In many jurisdictions, the plaintiff’s

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41. 57A AM. JUR. 2D *Negligence* § 295 (2004) (discussing the reasonable care standard applied to negligence cases involving dangerous instrumentalities); *see also* *Stewart v. Motts*, 654 A.2d 535, 539 (Pa. 1995) (recognized only one standard for care in actions involving dangerous instrumentalities, the standard of reasonable care); *Wyrulec Co. v. Schutt*, 866 P.2d 756, 762 (Wyo. 1993) (the standard is ordinary care in all circumstances, regardless of whether a dangerous instrumentality is involved).
  42. *See, e.g.*, 57A AM. JUR. 2D *Negligence* § 295 (2004); *Burch v. Sun St. Ford*, 864 So.2d 466, 470, 473 (Fla. Dist. Ct. App. 2004) (imputing driver’s liability of intentional misconduct to owner of motorcycle via Florida’s dangerous instrumentality doctrine); *Friou v. Phillips Petrol. Co.*, 948 F.2d 972, 975 (5th Cir. 1991) (applying Louisiana statute for imputing liability on owners of objects that cause unreasonable risk of injury).
  43. *See Aurbach v. Gallina*, 753 So.2d 60, 62 (Fla. 2000) (stating that a vehicle owner is strictly liable for a driver’s negligence if he voluntarily entrusts the vehicle to be used by another).
  44. *See, e.g.*, *Friou*, 948 F.2d at 975 (“[L]iability is strict in that the custodian of the thing is presumed to know ‘of the risk presented by the thing under his control.’”) (quoting LA. CIV. CODE ANN. ART. 2317).
  45. CAL. VEH. CODE § 38750 (West 2013) (stating all autonomous cars must be accompanied by a human driver); *see also* FLA. STAT. ANN. § 316.86 (West 2012); NEV. REV. STAT. ANN. § 482A.100 (West 2012).
  46. *See, e.g.*, 57A AM. JUR. 2D *Negligence* § 295 (2004).
  47. *See* RESTATEMENT (SECOND) OF TORTS § 496A cmt. d (1977).

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recovery is barred by a successful showing of contributory negligence or assumption of risk.<sup>48</sup> Contributory negligence may be established when a victim intentionally or unreasonably exposed himself to a danger created by the vehicle owner that the victim knew or should have known about, or otherwise acted unreasonably.<sup>49</sup> For example, contributory negligence can be shown by jumping from a moving vehicle, suddenly stopping, or running into the road.<sup>50</sup> Assumption of risk is established by the victim voluntarily assuming “a risk of harm arising from the negligent or reckless conduct of the defendant.”<sup>51</sup> An essential element of assumption of risk is implicit or explicit consent to undertake the risk by the victim.<sup>52</sup>

The current automobile accident laws are inadequate to address autonomous cars for several reasons.<sup>53</sup> Liability based on drivers and runaway cars focuses on the actions of the person responsible for driving or operating the car. An autonomous car would not have a human driver or operator, rendering these liability models inapplicable.<sup>54</sup> The model for imposing liability for defective vehicles is more easily applied to autonomous cars; however, this

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48. *Id.* (explaining that recovery may be barred by either contributory negligence, assumption of risk, or both). See generally Marchant & Lindor, *supra* note 11, at 1336–37 (describing the assumption of risk defense and noting assumption of risk defenses for autonomous cars would likely only extend to the owners and users of the autonomous cars and not to the occupants of the other vehicle for purposes of suing a manufacturer).
49. RESTATEMENT (SECOND) OF TORTS § 466 (1977).
50. See *id.* § 466 cmt. c (“[T]he plaintiff must know of the physical condition created by the defendant’s negligence and must have knowledge of such facts that, as a reasonable man, he should realize the danger involved. Furthermore, the plaintiff must intentionally expose himself to this danger.”).
51. RESTATEMENT (SECOND) OF TORTS § 496A (1977).
52. *Id.* § 496A cmt. c (“[A]ssumption of risk means that the plaintiff has given his express consent to relieve the defendant of an obligation to exercise care for his protection, and agrees to take his chances as to injury from a known or possible risk. The result is that the defendant, who would otherwise be under a duty to exercise such care, is relieved of that responsibility, and is no longer under any duty to protect the plaintiff . . . A second, and closely related, meaning is that the plaintiff has entered voluntarily into some relation with the defendant which he knows to involve the risk, and so is regarded as tacitly or impliedly agreeing to relieve the defendant of responsibility, and to take his own chances . . . Again the legal result is that the defendant is relieved of his duty to the plaintiff.”).
53. See generally Dana M. Mele, *The Quasi-Autonomous Car as an Assistive Device for Blind Drivers: Overcoming Liability and Regulatory Barriers*, 28 SYRACUSE SCI. & TECH. L. REP. 26, 41–47 (2013) (discussing the challenges of introducing autonomous cars onto public roads with the current liability laws).
54. See generally *id.* at 27.

model only addresses accidents that are caused by known defects.<sup>55</sup> Only a minority of jurisdictions that impose strict liability for dangerous instrumentalities apply liability for unknown defects.<sup>56</sup> Additionally, accidents can be caused by many factors that do not involve defects, such as poor road maintenance, weather conditions, and unpredictable behavior by other drivers, pedestrians, and children. Accidents for autonomous cars could also be caused by viruses, network outages, dropped satellite signals, and a variety of problems caused by normal wear and tear. Current vehicle laws do not comprehensively address accident liability for autonomous cars.<sup>57</sup>

## B. Computer Systems Law

Because autonomous cars rely largely on computer technology, it would seem that the law governing computers may be relevant. However, upon examination, computer law contains certain aspects that relate to autonomous cars, but fails to provide an adequately complete legal model for autonomous car liability. The aspects of computer law that apply to autonomous cars address the role of computers, liability for autonomous systems, and the use of computers to inflict personal injury and property damage. However, while autonomous cars will contain a computer, the car will be more than just a computer and require a different view of liability.

The law does not recognize the computer as a legal entity, but instead views it as the instrumentality of the person using it; the user is liable for damage caused by the instrumentality even if that damage was unintended or unanticipated.<sup>58</sup> In *State Farm Mutual Automobile Insurance Co. v. Bockhorst*, the court held that an insurance company must honor a policy that the company's computer system erroneously reinstated, even though the policy was ineligible by the company's standards.<sup>59</sup> In *McEvans v. Citibank*, the court held that an ATM created a bailment relationship between the bank and the bank customer, holding Citibank responsible for a deposit that was lost

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55. The scope of this paper will not discuss products liability claims for defective vehicles that may arise against manufacturers, programmers, and retailers of autonomous cars.

56. See, e.g., 57A Am. Jur. 2d *Negligence* § 295 (2004).

57. See generally Mele, *supra* note 53, at 28 (discussing newness of technology and uncertainty regarding manufacturer liability).

58. RESTATEMENT (THIRD) OF AGENCY § 1.04 cmt. e (2006) (“[C]omputer programs are instrumentalities of the persons who use them . . . the legal consequences for the person who uses it are no different than . . . any other . . . instrumentality.”). But see Gabriel Hallevy, “*I, Robot—I, Criminal*”—*When Science Fiction Becomes Reality: Legal Liability of AI Robots Committing Criminal Offenses*, 22 SYRACUSE SCI. & TECH. L. REP. 1, 1 (discussing the imposition of liability upon robots).

59. *State Farm Mut. Auto. Ins. Co. v. Bockhorst*, 453 F.2d 533, 536–37 (10th Cir. 1972).

by the machine.<sup>60</sup> Courts have found the users liable for the actions taken by the instrumentalities, even though the users were not aware of and did not intend those actions.<sup>61</sup>

A computer user can also be liable for the same types of damages that commonly arise in an automobile collision: personal injury and property damage. Personal injury, such as infliction of emotional distress, can be inflicted through the use of a computer.<sup>62</sup> In *Stockdale v. Baba*, the court found a stalker who posted messages on an Internet message board frequented by the victim could be liable for intentional infliction of emotional distress.<sup>63</sup> Similarly, in *Catsouras v. Department of California Highway Patrol*, the court found that police officers who posted pictures of automobile accidents on the Internet could be found liable to the accident victims' family members for intentional infliction of emotional distress.<sup>64</sup>

Property damage in computer cases typically consists of interference with a person's use of their computer.<sup>65</sup> Courts have invoked the doctrine of chattels to resolve these litigation issues.<sup>66</sup> The doctrine of chattels holds that owners are protected against harm caused to their chattel.<sup>67</sup> Trespass to chattels occurs when there has been intentional interference with the owner's ability to use his chattel.<sup>68</sup> Courts have invoked the concept of trespass to

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60. *McEvans v. Citibank*, 408 N.Y.S.2d 870, 872–73 (N.Y. Civ. Ct. 1978).
  61. *See id.*; *Bockhorst*, 453 F.2d at 536–37.
  62. *See generally* Jay M. Zitter, Annotation, *Claims for Vicarious and Individual Liability for Infliction of Emotional Distress Derived from Use of Internet and Electronic Communications*, 30 A.L.R. 6th 241 (2010) (discussing several cases involving the use of computers to inflict emotional harm).
  63. *Stockdale v. Baba*, 153 Ohio App. 3d 712, 2003-Ohio-4366, 795 N.E.2d 727, ¶ 48 (10th Dist.).
  64. *Catsouras v. Department of California Highway Patrol*, 104 Cal. Rptr. 3d 352, 394 (Ct. App. 2010).
  65. *See, e.g.*, *eBay, Inc. v. Bidder's Edge, Inc.*, 100 F. Supp. 2d 1058, 1071–72 (N.D. Cal. 2000) (holding a creator of spyware liable for harm caused by interfering with computer owners' use of their property, and noting that “[e]ven if, as BE [the spammer] argues, its searches use only a small amount of eBay’s computer system capacity, BE has nonetheless deprived eBay of the ability to use that portion of its personal property for its own purposes”); *see generally* Laura Quilter, *The Continuing Expansion of Cyberspace Trespass to Chattels*, 17 BERKELEY TECH. L.J. 421, 428–35 (2002) (discussing several cases involving the use of computers to access corporate data).
  66. *See* Quilter, *supra*, note 65, at 428–35 (discussing the application of trespass to chattels to computers).
  67. *See generally* RESTATEMENT (SECOND) OF TORTS §§ 217–18 (1977); *see also* W. PAGE KEETON ET. AL., PROSSER & KEETON ON THE LAW OF TORTS § 14, at 85–88 (West, 5th ed. 1984).
  68. RESTATEMENT (SECOND) OF TORTS § 217 (1977).

chattels in cases where computer owners were harmed by another user's "trespass" upon their computer, resulting in interference with the owner's use of his computer.<sup>69</sup> Additionally, courts found spam creators liable for trespass to chattels for interfering with the email providers' servers.<sup>70</sup> In both personal injury and property cases, courts have based liability upon the actions of the persons who used the computers to cause harm.

Liability for autonomous systems has only been addressed in the limited context of commercial transactions. The National Conference of Commissioners on Uniform State Laws designed the Uniform Electronic Transactions Act (UETA, or E-SIGN Act) to create a unified body of law to govern the use of autonomous computer systems in business and government transactions.<sup>71</sup> A majority of states, the District of Columbia, Puerto Rico, and the Virgin Islands have adopted the UETA.<sup>72</sup> The UETA discusses the liability of the user of an autonomous system in commercial transactions involving electronic records and systems.<sup>73</sup> The statute is typically invoked to bind parties to commercial transactions using electronic signatures, or to enter online agreements.<sup>74</sup> The UETA provides an example of a user being bound by an electronic agent, whereby a computer user is legally bound to a contract by

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69. See Quilter, *supra*, note 65, at 428–34 (discussing the application of trespass to chattels to computers).
70. *Compuserve v. Cyberpromotions, Inc.*, 962 F. Supp. 1015, 1027 (S.D. Ohio 1997); *Am. Online, Inc. v. IMS*, 24 F. Supp. 2d 548, 550 (E.D. Va. 1998). *But see Adam Mossoff, Spam: Oy, What a Nuisance!*, 19 BERKELEY TECH. L.J. 625, 640–41 (summarizing the evolution of case law relating to spam and recognizing a shift in spam-related jurisprudence toward classifying the claims as nuisance rather than trespass to chattels).
71. See UNIF. ELEC. TRANSACTIONS ACT, Prefatory Note, 7A Pt. I U.L.A. 211, 213 (1999), available at [http://www.uniformlaws.org/shared/docs/electronic%20transactions/ueta\\_final\\_99.pdf](http://www.uniformlaws.org/shared/docs/electronic%20transactions/ueta_final_99.pdf).
72. See Uni. Elect. Transactions Act, NAT'L CONFERENCE OF STATE LEGISLATURES, <http://www.ncsl.org/issues-research/telecom/uniform-electronic-transactions-acts.aspx> (last visited Oct. 18, 2013) (showing a table of jurisdictions which have adopted the UETA. Illinois, New York and Washington, have not adopted the UETA, but have similar statutes.).
73. See UNIF. ELEC. TRANSACTIONS ACT, *supra* note 71, § 14 (discussing the effect of Automated Transactions on commercial transactions). "The Scope of this Act is inherently limited by the fact that it only applies to transactions related to business, commercial (including consumer) and governmental matters. Consequently, transactions with no relation to business, commercial or governmental transactions would not be subject to this Act." *Id.* § 3 cmt. 1.
74. See *id.* at Prefatory Note (identifying the applications of the UETA to electronic records, signatures, and contracts).

clicking “I Agree” on a website, even if the user was not aware that a contract was being formed.<sup>75</sup>

The UETA defines systems that operate without human operators as “electronic agents.”<sup>76</sup> The UETA views electronic agents as a tool of the user and states that the user can be legally bound by the tool’s actions, even if the user had no involvement in, or knowledge of, the transaction.<sup>77</sup> In this way, the UETA can be seen as an application of the instrumentality theory to computers and computer users.<sup>78</sup> However, the UETA is quite narrow. The UETA is specifically limited to commercial transactions conducted using electronic systems or documents,<sup>79</sup> where both parties have agreed to the transaction.<sup>80</sup> The UETA also specifically notes that it proceeds on the assumption that an electronic agent is functioning within the parameters of its programming, and, in the event a system becomes fully autonomous and begins to act independently, “courts may construe the definition of electronic agent accordingly, in order to recognize such new capabilities.”<sup>81</sup> Therefore,

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75. *Id.* § 14 cmt. 3 (“By clicking ‘I agree’ [the user] adopted a process with the intent to ‘sign,’ i.e., bind herself to a legal obligation, the resulting record of the transaction. If a “signed writing” were required under otherwise applicable law, this transaction would be enforceable.”).
  76. *Id.* § 2 (“‘Electronic agent’ means a computer program or an electronic or other automated means used independently to initiate an action or respond to electronic records or performances in whole or in part, without review or action by an individual.”).
  77. *Id.* § 2 cmt. 5 (“An electronic agent, such as a computer program or other automated means employed by a person, is a tool of that person. As a general rule, the employer of a tool is responsible for the results obtained by the use of that tool since the tool has no independent volition of its own . . . . An electronic agent, by definition, is capable within the parameters of its programming, of initiating, responding or interacting with other parties or their electronic agents once it has been activated by a party, without further attention of that party.”).
  78. *See* RESTATEMENT (THIRD) OF AGENCY § 1.04 cmt. e (2006) (describing the instrumentality theory of computer programs).
  79. UNIF. ELEC. TRANSACTIONS ACT, *supra* note 71 § 3 cmt. 1 (“The Scope of this Act is inherently limited by the fact that it only applies to transactions related to business, commercial (including consumer) and governmental matters. Consequently, transactions with no relation to business, commercial or governmental transactions would not be subject to this Act.”).
  80. *Id.* at Prefatory Note (stating “recognition that the paradigm for the Act involves two willing parties conducting a transaction electronically . . . the Act only applies between parties that have agreed to conduct transactions electronically”).
  81. *Id.* § 2 cmt. 5 (“While this Act proceeds on the paradigm that an electronic agent is capable of performing only within the technical strictures of its preset programming, it is conceivable that, within the useful life of this Act, electronic

the UETA accepts that completely autonomous systems may arise; however, it declines to extend its language to encompass these transactions as it stands. Instead, the UETA invites courts to interpret the statute in light of these new technological developments.

Certain notions of computer law could carry over to autonomous cars, but existing laws do not address how liability would be assessed in an automobile collision. Computer law would suggest an autonomous car to be an instrumentality of its owner; therefore, the owner will be liable for the acts of the car—even acts unintended and unanticipated—much like the automated systems in *Bockhorst*<sup>82</sup> and *McEvans*.<sup>83</sup> The current methods to assess liability for personal injury and property damage inflicted through the use of a computer are inapplicable to autonomous cars because they rely on the actions of a human computer user, which would not exist in an autonomous car.

The UETA forays into applying the instrumentality doctrine to computer systems acting without human involvement, but it is inapplicable to autonomous cars in several ways. Primarily, the UETA is limited to commercial transactions.<sup>84</sup> Simply expanding the scope of the UETA to cover non-commercial transactions is not beneficial because the statute is not comprehensive enough to be applied to automobile collisions. The UETA was designed with purely economic consequences in mind.<sup>85</sup> The UETA assumes that parties have consensually entered into a commercial transaction and, therefore, understand and accept the risks involved.<sup>86</sup> A party entering into a commercial transaction can anticipate and estimate potential damages by examining profit calculations, contract terms, pricing agreements, and defined time periods. In contrast, the owner of an autonomous car cannot anticipate the time, place, injuries, or property damage of an automobile collision. The potential damage from any automobile collision is impossible to estimate with any accuracy.

Additionally, the UETA proceeds on the assumption that a computer system is functioning as it is programmed, and specifically declines to extend its coverage to autonomous systems that can think, act, and change without

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agents may be created with the ability to act autonomously, and not just automatically.”).

82. See *Bockhort*, 453 F.2d at 537.

83. See *McEvans*, 408 N.Y.S.2d at 871–72.

84. UNIF. ELEC. TRANSACTIONS ACT, *supra* note 71 § 14 cmt. 1 (explaining that “transactions with no relation to business, commercial or governmental transactions would not be subject to this Act”).

85. See *id.* at Prefatory Note.

86. See *id.* (“[R]ecognition that the paradigm for the Act involves two willing parties conducting a transaction electronically . . . the Act only applies between parties that have agreed to conduct transactions electronically.”).

human involvement.<sup>87</sup> The UETA clearly states that courts will need to interpret the statute in different contexts to incorporate changes in technology,<sup>88</sup> implying that the statute, as it stands, is not only inadequate to address autonomous systems, but it is not intended to do so. The UETA is important in a legislative context because it demonstrates that lawmakers feel the user of an autonomous system should be held liable for its actions, even if the user has no involvement or knowledge of the action.

In summary, automobile liability could only be applied to autonomous cars in the event that the collision was caused by a known defect<sup>89</sup> or unknown defect in a minority of jurisdictions.<sup>90</sup> Computer law supports the notion that the user of an autonomous car should be liable for the acts of the car, but it does not provide direction for assessing this liability.<sup>91</sup> Therefore, accidents caused by other factors require a new body of law to be developed that addresses the determination of liability for autonomous car owners.

### C. Liability of Canine Owners

Canine ownership and liability laws provide a good model on which to base laws governing autonomous cars because autonomous cars are highly analogous to canines; both dogs and autonomous cars think and act independently from their human owners, that may similarly inflict personal injury or cause property damage.

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87. *Id.* § 2 cmt. 5 (“While this Act proceeds on the paradigm that an electronic agent is capable of performing only within the technical strictures of its preset programming, it is conceivable that, within the useful life of this Act, electronic agents may be created with the ability to act autonomously, and not just automatically.”).
  88. *Id.* (“[T]hrough developments in artificial intelligence, a computer may be able to ‘learn through experience, modify the instructions in their own programs, and even devise new instructions.’ If such developments occur, courts may construe the definition of electronic agent accordingly, in order to recognize such new capabilities.”) (citations omitted).
  89. See RESTATEMENT (SECOND) OF TORTS § 388 cmt. g (1977) (stating that a vehicle owner’s duty is to exercise reasonable care to disclose information the owner possesses); see also *Pfeifer*, 628 N.E.2d at 750 (finding that a vehicle owner’s actual knowledge can be established by circumstantial evidence).
  90. See 57A AM. JUR. 2D *Negligence* § 295. See, e.g., *Burch*, 864 So. 2d at 470–72 (stating that Florida is the only state to adopt imputing driver’s liability of intentional misconduct to owner of motorcycle via Florida’s dangerous instrumentality doctrine); see also *Friou*, 948 F.2d at 975 (applying Louisiana statute for imputing liability on owners of objects that cause unreasonable risk of injury).
  91. See *Marchant & Lindor*, *supra* note 11, at 1322.



Animals, like computers,<sup>92</sup> are not legal persons, and cannot be held personally liable for their actions.<sup>93</sup> The doctrine of chattels is invoked—similar to the way it is invoked for the use of computers<sup>94</sup>—to hold animal owners responsible for damage and injuries caused by their animals.<sup>95</sup> Canine owners can be liable for their dogs' acts<sup>96</sup> in two ways: 1) strict liability imposed by statute;<sup>97</sup> or 2) the common law "one bite rule."<sup>98</sup> A canine owner may avoid strict or common law liability if the victim acted in a way that provides the canine owner with a defense against liability.<sup>99</sup>

Strict liability statutes for dog bites date back to the 1700s and were enacted to ensure that the victim of a dog attack had financial recourse for injuries caused by an aggressive dog.<sup>100</sup> Concerned with the serious physical danger that canine attacks pose, coupled with the millions of dog attacks per

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92. RESTATEMENT (THIRD) OF AGENCY § 1.04 cmt. e (2006) (“[C]omputer programs are instrumentalities of the persons who use them . . . the legal consequences for the person who uses it are no different than . . . any other . . . instrumentality.”).
  93. *Dye v. Wargo*, 253 F.3d 296, 299–300 (7th Cir. 2001) (finding that a dog is not a legal personality).
  94. RESTATEMENT (SECOND) OF TORTS §§ 217–18 (1977); KEETON ET AL., *supra* note 67, § 14, at 85–88.
  95. *See, e.g.*, KEETON ET AL., *supra* note 67, § 14, at 85–88.
  96. This section only addresses liability an animal owner faces when his animal acts independently because this situation is most analogous to a driverless car operating of its own volition. Animal owners may also be liable for their own negligent acts, such as violation of leash laws and failure to adequately fence their yards. *See generally* DOG BITE LAW, <http://www.dogbitelaw.com> (last visited Oct. 26, 2013).
  97. *See generally* Ward Miller, Annotation, *Modern Status of Rule of Absolute or Strict Liability for Dogbite*, 51 A.L.R. 4th 446 (2010) (summarizing variations in state statutes for strict liability for dog bites); *see also* Rebecca F. Wisch, *Quick Overview of Dog Bite Strict Liability Statutes*, ANIMAL LAW (2012), <http://www.animallaw.info/articles/State%20Tables/tbusdogbite.htm> (reporting that 36 states have enacted strict liability statutes for canine owners).
  98. *See, e.g.*, RESTATEMENT (SECOND) OF TORTS § 518 cmts. g, h (1977) (stating that an owner of animals has a duty of care to protect foreseeable persons from the animal's dangerous propensities of which the owner knows or should know).
  99. *See generally*, Jay M. Zitter, Annotation *Intentional Provocation, Contributory or Comparative Negligence, or Assumption of Risk as Defense to Action for Injury by Dog*, 11 A.L.R. 5th 127 (2010) (summarizing defenses against dog bite liability).
  100. Kenneth Phillips, *Statutory Strict Liability States*, DOG BITE LAW, <http://dogbitelaw.com/legal-rights-of-dog-bite-victims-in-usa/statutory-strict-liability-states.html> [hereinafter *Strict Liability States*] (last visited Oct. 20, 2013).

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year,<sup>101</sup> an increasing number of courts and state legislatures have chosen to discard the common law “one bite rule.”<sup>102</sup> Most states have now enacted strict liability statutes,<sup>103</sup> which impose liability upon canine owners for injuries caused by their dogs, without regard to the owner’s negligence or prior knowledge of the canine’s aggressiveness.<sup>104</sup> While no uniform statute exists, states may impose strict liability for all types of injuries, rather than exclusively for dog bites or severe injuries.<sup>105</sup> Some states restrict the financial liability of the canine owner to cover only medical expenses, while other states allow claims for pain and suffering.<sup>106</sup>

Canine owners in states that do not have strict liability statutes are liable under the common law “one bite rule,” which makes canine owners liable for their animals’ dangerous acts only if the canine displayed prior signs of aggression.<sup>107</sup> The canine is allowed one bite, or prior act of aggression,<sup>108</sup> before the canine owner is held liable for injuries sustained from an attack.<sup>109</sup> The victim must show the owner knew (actual knowledge) or should have known (constructive knowledge) their animal’s tendency to harm others.<sup>110</sup> Constructive knowledge can be established when the owner could have reasonably foreseen the injury based on the canine’s past aggressive behaviors, such as biting, snarling, snapping, or baring its teeth.<sup>111</sup>

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101. *Dog Bite Prevention*, CDC, (Sept. 2013) (reporting 4.5 million dog bites per year) <http://www.cdc.gov/homeandrecreationalafety/dog-bites/index.html>.
  102. Kenneth Phillips, *Criticism of the One Bite Rule*, DOG BITE LAW, <http://dogbitelaw.com/one-bite-rule/criticism-of-the-one-bite-rule.html> [hereinafter *Criticism*] (last visited Oct. 20, 2013).
  103. Wisch, *supra* note 97.
  104. *See* Dougan v. Nunes, 645 F. Supp. 2d 319, 322–24 (D.N.J. 2009) (finding canine owners strictly liable for plaintiff’s injuries under New Jersey statute N.J.S.A. 4:19–16); Pepper v. Triplet, 834 So. 2d 624, 630–31 (La. Ct. App. 2002) (applying Louisiana’s strict liability statute for canine owners).
  105. *See Strict Liability States*, *supra* note 100 (discussing variations among strict liability statutes).
  106. *Id.*
  107. Kenneth Phillips, *One Bite Rule Overview*, DOG BITE LAW <http://dogbitelaw.com/one-bite-rule/overview-of-the-one-bite-rule.html> (last visited Oct. 20, 2013).
  108. *See id.* (noting that the term “one bite rule” is a misnomer because the rule applies to any aggression, not just bites).
  109. *Criticism*, *supra* note 102.
  110. *See, e.g.*, RESTATEMENT (SECOND) OF TORTS § 518 cmts. g, h, i (1977) (stating that an owner of animals is liable for negligently failing to prevent the animal from harming another); *see also*, Miller, *supra* note 97.
  111. *See* Kenneth Phillips, *The “Dangerous Propensity”*, DOG BITE LAW, <http://dogbitelaw.com/one-bite-rule/dangerous-propensity.html> (discussing examples

In *State v. Powell*, the court held a fatal attack on a jogger was reasonably foreseeable by their owner because the dogs repeatedly escaped their yard, were trained to be aggressive, and had growled at people passing on the sidewalk.<sup>112</sup> A minority of states follow the common law rule,<sup>113</sup> and strict liability jurisdictions may apply the common law rule if the canine owner established a defense to liability or strict liability was inapplicable, such as if the statute applied only to severe injuries and the victim's injury was relatively minor.<sup>114</sup> Damages in one-bite jurisdictions may be higher than strict liability jurisdictions because punitive damages are permitted when the owner knew or should have known of the dog's prior aggression.<sup>115</sup>

A canine owner can defend against liability in certain instances, even in states that have strict liability. If the victim of a dog bite acted in a manner that contributed to the dog attack, the canine owner may be absolved of liability.<sup>116</sup> For example, trespassing on the canine owner's land,<sup>117</sup> or provoking by hitting<sup>118</sup> or taunting the animal<sup>119</sup> may allow the owner to avoid liability. If the provoking act was unintentional, the canine owner is liable only if the canine's reaction was disproportional to the provoking act.<sup>120</sup> In *Wade v. Rich*, the court found that a child had unintentionally provoked a dog by tripping over it, and the dog's reaction of repeatedly biting the victim severely enough to require twenty-three stitches was disproportionate to the

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of aggression that establish liability under the One Bite Rule) (last visited Oct. 20, 2013).

112. *State v. Powell*, 426 S.E.2d 91, 96 (N.C. App 1993) (finding that that constructive knowledge was established).
113. *See Wisch, supra* note 97.
114. *See Strict Liability States, supra* note 100.
115. *Id.*
116. *Zitter, supra* note 99.
117. *See Stroop v. Day*, 896 P.2d 439, 443 (Mont. 1995) (finding that the victim was not trespassing on the canine owner's land by resting his hands on the owner's fence), *overruled on other grounds by Giambra v. Kelsey*, 162 P.3d 134 (Mont. 2006).
118. *See, e.g., Paulsen v. Courtney*, 277 N.W.2d 233, 236 (Neb. 1979) (finding that a child provoked a dog by running at it, hitting it with a stick, and throwing dirt or rocks at it).
119. *See Reed v. Bowen*, 503 So. 2d 1265, 1266 (Fla. Dist. Ct. App. 1986) (stating that the child's conduct of pulling on the dog and "bugging" the dog could constitute provocation).
120. *See Zitter, supra* note 99.

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victim's unintentional act.<sup>121</sup> The court found the canine owner liable under the state statute for dog bite liability.<sup>122</sup>

Similarly, if a victim acted in a manner that would not normally provoke an attack—passing a dog in the street—the canine owner is liable for the victim's injuries. In *Eigner v. Race*, the court found the victim had not provoked the dog attack by merely getting out of her car in front of the dog.<sup>123</sup> In *Barr v. Groll*, the court found a motorcyclist had not provoked a dog by driving past as the dog crossed the street.<sup>124</sup> This nuance is particularly important to note because passing a dog in the street is similar to a driver or pedestrian sharing the road with an autonomous car. An autonomous car is unlikely to be “provoked” in this sense, but a pedestrian or third party's actions could affect the autonomous car causing it to crash. Most importantly, these defenses to strict liability show that the “victim's” actions can alleviate or negate the burden of strict liability if the victim contributed to causing the harm.

The growing trend of imposing strict liability upon canine owners reveals that state legislatures, and presumably the citizens electing the representatives, prefer strict liability to the common law “one bite rule.” This body of law demonstrates that the imposition of strict liability is an effective method of assessing liability for autonomous creatures that can act without control by their owners, such as dogs, and can be equally effective in assessing liability for autonomous cars.

### III. STRICT RECOMMENDATION

Automobile liability law addresses accidents caused by known defects. Computer law defines an autonomous car as an instrumentality, showing state legislatures would likely hold owners of autonomous cars accountable for the acts of their systems. No laws, however, address the standard of liability for accidents with non-defect causes, such as poor weather conditions, road maintenance, or third parties. An examination of liability for dogs—another autonomous creature—shows that autonomous vehicle liability should be strictly applied.

#### A. Justification

Canine ownership liability is a good model for developing laws for autonomous cars for several reasons. Canines and autonomous cars are similar

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121. *Wade v. Rich*, 618 N.E.2d 1314, 1320 (Ill. App. Ct. 1993) (stating that the viciousness of the dog's attack on the victim was “out of proportion to the unintentional act committed by [the victim]”).

122. *Id.* (stating that the dog's disproportionate reaction “clearly establishes the defendants' liability for plaintiff's damages”).

123. *Eigner v. Race*, 129 P.2d 444, 446 (Cal. Dist., Ct. App. 1942).

124. *Barr v. Groll*, 567 N.E.2d 13, 17 (Ill App. Ct. 1991).

in the purposes they serve and in the ways they act. Additionally, the justifications for imposing strict liability upon canine owners may similarly apply to autonomous car owners.

The purposes that canines and autonomous cars serve in society are very similar. Canines are domestic animals, which are an animal of a class “devoted to the service of mankind.”<sup>125</sup> A dog assists disabled persons, hunters, and law enforcement, provides protection, and offers companionship. An autonomous car, like most machines, is similarly “devoted to the service of mankind” by providing transportation. In addition, both canines<sup>126</sup> and computers<sup>127</sup> are classified as chattel, and are autonomous in the sense that they can “think,” act, move, and cause damage or injury without any control or involvement by their human owners. The chattel doctrine for canine ownership bases liability on ownership, without regard to involvement by a person.<sup>128</sup> The doctrine of chattels could be similarly applied to autonomous cars. For instance, the doctrine of chattels would apply to a canine owner that takes his dog, which has never displayed any violent tendencies in the past, for a walk outside where the dog then bites a person without provocation. The doctrine of chattels should similarly apply to an empty autonomous vehicle driving to pick up a family member from soccer practice that experiences a system glitch to the car’s sensors, and fail to recognize a pedestrian crossing the street. In both situations, the doctrine of chattels holds the owner liable for the injuries sustained by the victims.

The justifications for imposing strict liability upon canine owners are equally applicable to autonomous cars. Strict liability statutes address the danger that aggressive dogs pose to society. Millions of dog attacks<sup>129</sup> and motor vehicle collisions<sup>130</sup> occur every year. However, each year about thirty fatal dog attacks occur,<sup>131</sup> whereas automobile related fatalities exceed thirty

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125. RESTATEMENT (SECOND) OF TORTS § 506(2) cmt. a (1977).

126. See, e.g., KEETON ET AL., *supra* note 67, § 14, at 85–88.

127. See generally Mossoff, *supra* note 70, at 640 (stating significant case law establishing unauthorized access or spamming of another’s computer as trespass to chattels); Joseph D. Jean et al., *Dusting Off an Old Law*, RISK & INSURANCE (Nov. 1, 2009), <http://www.riskandinsurance.com/story.jsp?storyId=278946672> (stating that trespass to chattels has been instituted to hold spammers accountable for trespass against the victim’s computer).

128. See generally RESTATEMENT (SECOND) OF TORTS §§ 217–18 (1977); KEETON ET AL., *supra* note 67, § 14, at 85–88.

129. *Home and Recreational Safety: Dog Bites*, CDC (Sept. 23, 2013), <http://www.cdc.gov/homeandrecreationalafety/dog-bites/index.html>.

130. NHTSA, DOT HS 811 162, TRAFFIC SAFETY FACTS 2008 DATA, 1 (2008), available at <http://www-nrd.nhtsa.dot.gov/Pubs/811162.pdf> (reporting approximately 6 million automobile accidents in 2008).

131. *Investigative Reports of Dog Bite-Related Fatalities*, NAT’L CANINE RESEARCH COUNCIL, 2 (2011) [http://nationalcanineresearchcouncil.com/uploaded\\_files/](http://nationalcanineresearchcouncil.com/uploaded_files/)

thousand annually.<sup>132</sup> Although autonomous cars' increased safety features, and the removal of human error, would decrease the fatalities and injuries from automobile collisions, there still remains a significantly greater interest in imposing strict liability upon owners of driverless vehicles because automobile deaths far exceed those of dog attacks.

Moreover, applying animal laws to automobile accident is not as strange as it may initially sound. Many of the first cases surrounding automobiles resulted from cars frightening horses.<sup>133</sup> While there was significant discussion as to whether strict liability should apply to car owners in frightened horse cases, or generally to the operation of an automobile, courts determined strict liability was not the appropriate standard.<sup>134</sup>

Furthermore, courts have grappled with the analogy of dogs and cars before. In *Lewis v. Amorous*, the court stated, "It is not the ferocity of automobiles that is to be feared, but the ferocity of those who drive them . . . . They are not to be classed with bad dogs, vicious bulls, and evil disposed mules and the like."<sup>135</sup> However, with the adoption of autonomous vehicles, it will no longer be the driver that society should fear, but rather the vehicle. As such, it is more appropriate to treat accidents involving autonomous vehicles with a strict liability standard like "bad dogs, vicious bulls, and evil disposed mules."<sup>136</sup>

## B. Application of Strict Liability

Imposing strict liability upon autonomous car owners could seriously deter consumer purchases and insurance company coverage due to the potential for costly damages. Enforcing strict liability for autonomous car owners and shifting liability away from manufacturers could increase insurance premiums for the individual car owners.<sup>137</sup> Several factors, however, should de-

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tinymce/2011%20Final%20Investigative%20DBRF%20Report.pdf (reporting thirty-one deaths in 2011 from dog bites).

132. NHTSA, *supra* note 130 (reporting 37,261 fatalities in 2008).

133. *See* *Thompson v. Dodge*, 60 N.W. 545, 545 (Minn. 1894).

134. *See Torts—Liability Without Intent or Negligence—Operation of Defective Automobile*, 34 HARV. L. REV. 564, 565 (1921) (considering whether strict liability should apply to the operation of an automobile); *see also* *Macomber v. Nichols*, 34 Mich. 212, 215–16 (1876) (refusing to hold that the operation of a car requires strict liability and not reasonable care).

135. *Lewis v. Amorous*, 59 S.E. 338, 340 (Ga. Ct. App. 1907).

136. *See id.*

137. *See* Jeffrey K. Gurney, *Sue My Car Not Me: Products Liability and Accidents Involving Autonomous Vehicles*, 2013 U. ILL. J.L. TECH. & POL'Y 101, 127 (forthcoming 2013) (arguing it would be beneficial to move liability away from owners of autonomous vehicles by placing liability solely on the manufacturer as that would lower insurance premiums); David G. Owen, *Products Liability: Principles of Justice for the 21st Century*, 11 PACE L. REV. 63, 72 (1990) ("The

fray increased insurance costs. For example, the increased safety of these vehicles, relative to human-driven vehicles, reduces the chances of a collision and, subsequently, facing financial liability.<sup>138</sup> Like canine ownership, automatic car owners could also raise defenses that would allow them to avoid strict liability. In addition, the societal benefits of these cars may outweigh the financial burden imposed by strict liability.

The application of strict liability seems like a heavy burden for the owner to bear; however, it provides the best, and most comprehensive, system for dealing with autonomous cars. Strict liability eliminates the problem of determining how to assess liability without a human driver or operator. Strict liability has been an appropriate choice for liability in areas traditionally considered as highly dangerous, such as selling defective products<sup>139</sup> or demolition blasting.<sup>140</sup> In *Escolta v. Coca Cola Bottling Co.*, Chief Justice Traynor (then Justice Traynor), laid out justifications in his concurrence for imposing strict liability on a bottle manufacturer—which are equally applicable to owners of autonomous cars—when he stated, “public policy demands that responsibility be fixed wherever it will most effectively reduce the hazards to life and health.”<sup>141</sup> Furthermore, *Greenman v. Yuba Power Products, Inc.*, laid forth the basic purpose of enforcing strict liability.<sup>142</sup> “The purpose of [strict] liability is to insure that the costs of injuries” are not borne “by the injured persons who are powerless to protect themselves.”<sup>143</sup> Strict liability satisfies the same general principles when applied to the owner of an autonomous car.

Additionally, enforcing strict liability on the vehicle’s owner would also help protect innovation and encourage manufacturers to push forward the

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products liability system . . . does serve as a form of third-party insurance mechanism, in which the manufacturer, at least theoretically, adds a component to each product’s price—as a kind of insurance premium—to reflect anticipated future payouts for liability claims.”)

138. See Gurney, *supra* note 137 (noting that because human driver errors cause the majority of automobile deaths, autonomous cars should decrease the number of accidents and damage caused by the crashes).
139. See generally RESTATEMENT (SECOND) OF TORTS § 402A (1977) (discussing strict liability for sellers and manufacturers of defective products).
140. See generally Romualdo P. Eclavea & Jill Gustafson, Annotation, 31A AM. JUR. 2D *Explosions and Explosives* § 127 (2012) (discussing strict liability for municipalities whose licensed residents store explosives that result in explosions).
141. *Escolta v. Coca Cola Bottling Co.*, 150 P.2d 436, 440 (Cal. 1944) (Traynor, J., concurring).
142. See *Greenman v. Yuba Power Prods., Inc.*, 377 P.2d 897 (Cal. 1963) (setting forth the policy reasons behind strict liability).
143. *Id.* (arguing strict liability should apply in manufacture defect cases to protect the injured parties).

adoption of this technology. The benefits of autonomous vehicles will likely reduce accidents, decrease traffic congestion, increase productivity, and increase fuel efficiency.<sup>144</sup> Unfortunately, traditional “tort law routinely penalizes innovation, while rewarding manufacturers who adhere to the status quo.”<sup>145</sup> In other words, courts prefer the devil they know over the one they do not.<sup>146</sup> Often, this is because it is easier to focus on users, rather than manufacturers, when adopting a new technology.<sup>147</sup> Currently, car owners bear the majority of accident costs, as they are often the cause of the accident.<sup>148</sup> Shifting the costs away from the owner and to the manufacturers<sup>149</sup> would effectively stunt innovation and increase time to market. Holding the user strictly liable would encourage innovation and decrease time to market for autonomous cars, and in doing so, increase the benefits society could receive from this new technology.

It is important to note that liability regarding automobiles is an evolving doctrine. Today’s lawsuits do not resemble the initial round of lawsuits plaguing the industry.<sup>150</sup> For example, courts applied strict liability for ground damage caused by airplanes, blimps, and hot air balloons.<sup>151</sup> Strict liability was favored because these ground damages emerged from new technologies that were viewed as hazardous.<sup>152</sup> This strict liability standard for

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144. See Gurney, *supra* note 137, at 104–05 (discussing the benefits of autonomous vehicles).
  145. Kyle Graham, *Of Frightened Horses and Autonomous Vehicles: Tort Law and its Assimilation of Innovations*, 52 SANTA CLARA L. REV. 1241, 1266 (2012).
  146. See Peter Huber, *Safety and the Second Best: The Hazards of Public Risk Management in the Courts*, 85 COLUM. L. REV. 277, 307–08 (1985) (stating that courts often “prefer natural, old, or established hazards to those deriving from new technologies”).
  147. See Graham, *supra* note 145, at 1260–63 (describing the tendency to “blame the user” during the early adoption period of a new technology).
  148. See Marchant & Lindor, *supra* note 11, at 1327 (citing U.S. DEP’T OF TRANSP., DOT HS 811 059, NHTSA: NAT’L MOTOR VEHICLE CRASH CAUSATION SURVEY, at 24–26 (2008)) (stating drivers are at fault in the majority of automobile accidents).
  149. See Cyrus Pinto, *How Autonomous Vehicle Policy in California and Nevada Addresses Technological and Non-Technological Liabilities*, 5 INTERSECT, no. 1, 2012, at 6–8 (discussing how autonomous cars might shift the liability and costs of accidents from owners to manufacturers).
  150. See Graham, *supra* note 145 (noting how automobile litigation has changed overtime).
  151. See *Guille v. Swan*, 19 Johns. 381, 383 (N.Y. Sup. Ct. 1822).
  152. Geoffrey Christopher Rapp, *Unmanned Aerial Exposure: Civil Liability Concerns Arising from Domestic Law Enforcement Employment of Unmanned Aerial Systems*, 85 N.D. L. REV. 623, 635 (2009) (discussing automated airplane liability standards, specifically focusing on ground damage liability).



ground damages was supported by the Restatement of Torts and remained widely adopted, even after aviation safety improved.<sup>153</sup> However, this standard has slowly begun to change. The Restatement (Third) of Torts declined to take a position, and courts began to apply negligence standards rather than strict liability to the aircraft owner.<sup>154</sup> Consequently, courts can now apply either a negligence or strict liability standard.

Strict liability standards allow courts to impose liability upon the vehicle owner without determining the exact cause of an accident.<sup>155</sup> This will be especially helpful when dealing with cases involving autonomous cars because there may be no eyewitnesses to the car's actions leading up to the accident.<sup>156</sup> In addition, unexpected problems and issues will inevitably arise with the use of new technology and equipment.<sup>157</sup> Rather than sorting out liability on a case-by-case basis, strict liability will enable courts to resolve litigation quickly and efficiently.<sup>158</sup> As time passes, any issues will become more apparent and predictable, and the law can adapt its standard of liability accordingly.

If courts choose to impose strict liability, insurance policies will help defray the costs associated with autonomous car ownership. Both automobile and canine owners commonly hold insurance policies to guard against the financial risks that may arise from an automobile collision or dog attack.<sup>159</sup> Once an imputed liability statute is applied to the owner of a vehicle, the injured party receives the benefit of the owner's insurance.<sup>160</sup> If the policy

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153. RESTATEMENT (FIRST) OF TORTS § 520 cmt. b (1938).

154. See RESTATEMENT (THIRD) OF TORTS § 20 cmt. k (2010); see also *Crosby v. Cox Aircraft Co. of Wash.*, 746 P.2d 1198, 1202 (Wash. 1987) (holding negligence might be better applied to ground damage caused by airplanes than the strict liability standard for owners).

155. *Economic Analysis of Alternative Standards of Liability in Accident Law*, BRIDGE, <http://cyber.law.harvard.edu/bridge/LawEconomics/neg-liab.htm> [hereinafter *Standards of Liability*] (last visited Oct. 21, 2013).

156. See LeValley, *Autonomous Vehicle Liability—Application of Common Carrier Liability*, 36 SEATTLE U. L. REV., <http://seattleuniversitylawreview.com/e-suppl/2013/autonomous-vehicle-liability-application-of-common-carrier-liability/>.

157. *Id.*

158. *Standards of Liability*, *supra* note 155.

159. *Dog Bite Claims Cost Insurers \$497M in 2011, Insurance Group Says*, CBSNEWS (May 17, 2012, 7:10 AM), [http://www.cbsnews.com/8301-201\\_162-57436026/](http://www.cbsnews.com/8301-201_162-57436026/) (discussing generally the large number of insurance claims by the insured for recent dog bites).

160. *Allcity Ins. Co. v. Old Greenwich Delicatessen*, 349 N.Y.S. 2d 240, 243 (N.Y. Civ. Ct. 1973) (stating that imputed negligence statutes extend the benefit of the owner's "compulsory automobile insurance coverage" to parties injured by the vehicle).

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holder is liable for an accident or dog attack, the holder is financially responsible for only a nominal deductible amount.<sup>161</sup> The insurance provider is responsible for the remainder of any financial judgment.<sup>162</sup> Accordingly, an injured victim is able to recover financial damages regardless of the owner's financial position.<sup>163</sup>

Nearly every state in the United States requires vehicle owners to carry a minimum amount of liability insurance on each vehicle.<sup>164</sup> Importantly, automobile insurance policies cover the car itself.<sup>165</sup> The insurance provider is primarily responsible for financial remedies to parties injured by the vehicle, so long as the driver of the vehicle was in some way liable for causing the injury.<sup>166</sup> Canine owners similarly insure against financial liability for dog attacks. Homeowners insurance policies cover dog bite attacks that occur on the owner's property, automobile insurance policies may cover dog attacks that occur in the insured vehicle, and renters insurance policies may cover attacks that occur in a rented property.<sup>167</sup> While insurance providers have increasingly removed dog bite liability from policies, particularly for "dangerous breeds" such as Pit Bull Terriers and Rottweilers,<sup>168</sup> dog owners can

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161. See *Insurance*, LAW BRAIN, <http://lawbrain.com/wiki/Insurance> (last modified Feb. 5, 2010) (discussing general automobile insurance system).

162. See *id.*

163. See *Vehicle Entrepreneurship and Politics, A History of Automobile Insurance*, RANDOM HISTORY (Jan. 21, 2008), <http://www.randomhistory.com/1-50/022insurance.html> (describing the history and evolution of insurance).

164. Philip Reed, *How Much Car Insurance Do You Need?*, EDMUNDS (May 26, 2009), <http://www.edmunds.com/auto-insurance/how-much-car-insurance-do-you-need.html> (stating that forty-nine states require minimum liability insurance).

165. See Cameron Jones, *Excluded Drivers: Who is Covered on My Auto Insurance Policy and Who is Not?*, AUTO INSURANCE TIPS (July 28, 2009), <http://www.autoinsurancetips.com/excluded-drivers-covered-auto-insurance-policy-not> (stating that insurance follows the vehicle, not the driver).

166. See *id.* (stating that drivers with the owner's permission to operate the vehicle are generally covered under the owner's insurance policy).

167. See Kenneth Phillips, *Homeowner, Renter, and Other Insurance*, DOG BITE LAW, <http://dogbitelaw.com/insurance-for-dog-owner/homeowner-renter-other-insurance.html> (last visited Oct. 27, 2013) (summarizing coverage types for dog bites under various insurance policies).

168. See Kenneth Phillips, *What to Do if You Cannot Insure Your Dog*, DOG BITE LAW, <http://dogbitelaw.com/insurance-for-dog-owner/what-to-do-if-you-cannot-insure-your-dog.html> (last visited Oct. 27, 2013) (discussing denial of insurance coverage for dangerous breeds).

purchase supplemental insurance policies.<sup>169</sup> Similar insurance options for autonomous car owners could help defray the financial risks of strict liability.

Owners and insurance providers could potentially face sky-high costs if courts impose strict liability on autonomous cars. However, the likelihood of facing any liability is extremely low because of autonomous cars' novel safety features.<sup>170</sup> Additionally, insurance specifically designed for autonomous cars could be created, similar to elevator liability insurance.<sup>171</sup> The car can react to signals of pending collisions provided by motion detectors and sensors<sup>172</sup> much faster than a human would be able to. This feature significantly decreases the chance of a collision, which will result in lower insurance costs and premiums. Insurance providers already offer discounts for automated safety features, such as anti-theft devices, anti-collision systems, anti-lock braking, and airbags.<sup>173</sup> Additionally, the dangers of drunk driving, distracted driving (talking or texting while driving), reckless or negligent driving, road rage, and many other hazards caused by human drivers would be eliminated.<sup>174</sup> Lower risks would translate into lower costs for insurance providers and lower insurance premiums for autonomous car owners.<sup>175</sup>

Owners of autonomous cars could raise similar defenses to those available for vehicle owners and avoid strict liability in the same manner as canine owners. A successful showing of contributory negligence or assumption of risk by the injured party could invalidate strict liability for the autonomous car owner.<sup>176</sup> Regardless of eyewitness availability, cameras or other recording equipment on the autonomous car could provide video or other electronic evidence of the collision (akin to the "black box" flight recorded on airplanes).<sup>177</sup>

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169. *See id.* (discussing the trend towards removing dog bite liability from insurance policies).

170. *See* LeValley, *supra* note 156.

171. *See id.* (discussing elevator liability and the development of specific elevator insurance).

172. Marchetti, *supra* note 15.

173. *See generally* *Car Insurance Discounts*, CAR INSURANCE COMPANIES, <http://www.carinsurancecompanies.com/car-insurance-discounts/> (last visited Oct. 27, 2013) (noting the types of discounts insurance companies provide for improved car technologies).

174. *See* *How are Insurance Rates Set?*, PROFESSIONAL INSURANCE AGENTS, [http://www.pia.org/IRC/qs/qs\\_other/QS90360.pdf](http://www.pia.org/IRC/qs/qs_other/QS90360.pdf) (last visited Oct. 21, 2013) (discussing how auto insurance rates are formed through analysis of type of car and driving record).

175. *See id.*

176. 57B AM. JUR. 2D *Negligence* § 797 (2009).

177. *What is a Black Box?*, NATIONAL GEOGRAPHIC CHANNEL, <http://natgeotv.com/uk/air-crash-investigation/black-box> (last visited Oct. 21, 2013).

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The potential societal benefits of autonomous cars are significant.<sup>178</sup> For instance, the hazards of negligent, reckless, drunk and distracted driving will essentially be eliminated.<sup>179</sup> Autonomous cars are capable of minimizing fuel usage by adjusting speed to maximize efficiency<sup>180</sup> and monitoring carbon emissions.<sup>181</sup> The cars could also communicate with each other to avoid and reduce traffic congestion.<sup>182</sup> Additionally, the cars could be partially powered by solar panels.<sup>183</sup> For many owners, the potential savings in time, fuel efficiency, and the environmental benefits could outweigh the probability of strict liability exposure.

#### IV. CONCLUSION

Autonomous cars will be a common sight on our roads in the near future. Existing laws governing vehicles and computers do not provide the proper means to assess liability for autonomous cars. These bodies of law show the owner of an autonomous car will be held liable for the acts of the car, but do not define the standard of liability to be applied. By examining the laws governing canine ownership, strict liability seems to be a practical and effective standard for autonomous cars. Furthermore, as states and government regulatory bodies begin to promote the autonomous car technology,<sup>184</sup> it is imperative to have a system of liability in place capable of

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178. See LeValley, *supra* note 156.

179. NHTSA, *supra* note 130, at 1, 4, 7, 10 (reporting 37,261 auto accident fatalities, 11,674 speeding related fatalities, 11,773 alcohol related fatalities, and that 55% of traffic fatalities in 2008 involved passengers not wearing seatbelts in 2008).

180. John Markoff, *Google Cars Drive Themselves, in Traffic*, N.Y. TIMES (Oct. 9, 2010), [http://www.nytimes.com/2010/10/10/science/10google.html?\\_r=1&src=tw&tw=nytimes](http://www.nytimes.com/2010/10/10/science/10google.html?_r=1&src=tw&tw=nytimes) (discussing the fuel efficiency capabilities of the vehicles).

181. Marchetti, *supra* note 15 (reporting that the cars send carbon usage reports to team members) (available in cached form only).

182. Greg Hack, *Driverless Cars Just Around the Corner*, COMPLEX EVENT PROCESSING & REAL TIME INTELLIGENCE (reposted on Aug. 10, 2010), <http://www.complexevents.com/2010/08/10/driverless-cars-just-around-the-corner> (theorizing that autonomous cars may be able to communicate with each other to move in concert with maximum efficiency); David Williams, *Audi's Driverless Car Goes Racing*, TELEGRAPH (Dec. 1, 2009), <http://www.telegraph.co.uk/motoring/news/6693453/Audis-driverless-car-goes-racing.html> (stating that the cars can help drivers reduce road congestion).

183. See Thrun, *supra* note 5.

184. See Angela Greiling Keane, *Google's Self Driving Cars Get Boost from U.S. Agency*, BLOOMBERG (May 30, 2013), <http://www.bloomberg.com/news/2013-05-30/google-s-self-driving-cars-get-boost-from-u-s-agency.html> (noting the U.S. government is actively supporting autonomous car technology).

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handling the inevitable claims arising out of a shared roadway.<sup>185</sup> Furthermore, setting forth a strict liability standard for autonomous vehicle owners could further incentivize manufactures to push the adoption of autonomous technology, expediting the vast benefits society will receive.

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185. See Marchant & Lindor, *supra* note 11, at 1337 (stating that while it is rare for legislation to intervene to protect specific technologies, it is not unheard-of as there have been specific protections set forth for the nuclear industry).