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# "Why Did The Self-Driving Car Crash??? *Because They Forgot To Install The Driver!!!*"
# Legal Liability And Insurance Coverage Issues Related To The Implementation Of Autonomous Vehicles On Public Roadways


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## I. **Overview**

This Session will help develop a basic understanding of autonomous vehicle (AV) technology and its societal implications (e.g. fewer accidents, fewer car owners and licensed drivers, smaller cars, roads, and parking lots, fewer jobs in transportation sector). In addition, this Session will focus on the potential implications regarding legal liability arising out losses involving autonomous vehicles and the corresponding implications for risk management practices (i.e. insurance, etc.)

## II. **Current State of Technology – Short-term and Long-term Predictions**

### A. Technology and Terminology

1. **Automated Driving System (ADS) –** The term of art for autonomous vehicles. "The hardware and software that are collectively capable of performing the entire DDT [Dynamic Driving Task] on a *sustained* basis."[1]

2. **Dynamic Driving Task (DDT) –** All of the real-time operational and tactical functions required to operate a vehicle in on-road traffic, excluding the strategic functions such as trip scheduling and selection of destinations and waypoints, and including without limitation:

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[1] Society of Automotive Engineers (SAE) International, Surface Vehicle Recommended Practice: Taxonomy and Definitions for Terms Related to Driving Automation Systems for On-Road Motor Vehicles J3016 (June, 2018) p. 5 (revising original 2014 publication).

**(a)** Lateral vehicle motion control via steering (operational);

**(b)** Longitudinal vehicle motion control via acceleration and deceleration (operational);

**(c)** Monitoring the driving environment via object and event detection, recognition, classification, and response preparation (operational and tactical);

**(d)** Object and event response execution (operational and tactical);

**(e)** Maneuver planning (tactical); and

**(f)** Enhancing conspicuity via lighting, signaling and gesturing, etc. (tactical).[2]

3. **Lidar –** laser mapping technology used on many autonomous vehicles. An emitter spins around firing rapid pulses of laser light at surfaces in every direction, catching the reflections, and taking hundreds of thousands of simultaneous depth measurements.

**B. Levels of Automation**

Current industry guidelines are set by the Society of Automotive Engineers (SAE) International. As a general matter, the higher applicable level of automation, the less human interaction is requires on the part of the owner and/or operator of the AV.

[2] *Id.* at 6.

1. **<u>Level 0 - No automation</u>**

2. **<u>Level 1 - Driver Assistance</u> ("hands on"):** At least one advanced driver-assistance feature such as adaptive cruise control or lane-keeping technology. Mobility is supervised by a human.

3. **<u>Level 2 - Partial Automation</u> ("hands off"):** Automation of at least two advanced driver assistance features that work in a coordinated fashion (*e.g*. adaptive cruise control, active lane-keeping technology, or automatic emergency braking. Human must still actively monitor vehicle and be ready to intervene at any time.

4. **<u>Level 3 - Conditional Automation</u> ("eyes off"):** A large leap in complexity from Level 2. Vehicle is capable of taking full control and operating itself during select parts of a journey (*e.g.*, it can drive itself on freeways (excluding on and off ramps) but not within cities.) Driver must still remain alert to take over in the event conditions are such that the vehicle is not capable of full automatic operation for part(s) of the journey.

5. **<u>Level 4 - High Automation</u> ("mind off"):** Capable of completing an entire journey without human intervention, but may have some constraints. For example, it may be constrained to a certain geographical area or prohibited from operating beyond a certain speed. Vehicle capable of parking itself if human fails to retake control when prompted to do so. Not currently available to the public.

6. **<u>Level 5 - Full Automation</u> ("steering wheel optional"):** Full autonomous driving for all driving scenarios (no geographical or speed limitations). May not be equipped with a steering wheel, gas pedal, or brake pedal. This is the ultimate goal of most autonomous vehicle developers.

## C. Short-term Predictions:

1. **<u>Fewer accidents</u>:** Between 93 percent and 95 percent of auto accidents are caused by human error. KMPG estimates that automobile accidents will be reduced by 80% by 2040 as autonomous vehicles replace driver-controlled vehicles, eliminating human error. <u>However</u>, the cost of accidents is likely to increase significantly due to expensive AV technology.

2. **<u>Fewer vehicle owners</u>:** Cost of new AVs prohibitive to most consumers. More vehicles owned and deployed on a “fleet” basis. Using fleets of autonomous on-call vehicles saves not only the cost of a depreciating asset that spends 95 percent of its time idle but also saves on insurance premiums. Surveys show that already, young people value vehicle ownership and having a driver’s license far less than previous generations.

## D. Long-term Predictions:

1. **<u>More compact/lightweight vehicles</u>:** With fewer accidents, there may be fewer safety regulations in manufacturing, leading to more compact, lightweight vehicles, which in turn do less damage to roads.

2. **<u>Smaller roads and parking lots</u>:** AVs will be able to drive very close together, eventually leading to smaller roadways and more "walkable"/"bikeable" city areas. Additionally, fleet-based vehicles will reduce the need to keep cars idle in a parking lot, as AVs can simply drive themselves from one pickup location to another.

## III. <u>Risks And Rewards In Insuring AVs, AV Owners and AV Manufacturers</u>

### A. Overall Lower Insurance Premiums

With fewer accidents, it is likely that consumers will come to expect lower insurance premiums in connection with first and third party coverage for risks corresponding to AV usage/ownership. At the same time, and as discussed below, new forms of coverage likely will become increasingly common in insurance policies covering AV-related risks.

However, costs associated with repairing automated vehicles likely will be higher than the costs of repairing non-automated vehicles due to both the costs of repairing/replacing the technology involved as well as the testing that will be required of the repair shop to determine that the self-driving capabilities have been restored. (*See* https://www.consumerreports.org/car-repair/the-hidden-cost-of-car-safety-features/ [last accessed on January 31, 2020].)

It is unclear whether or how soon overall insuring costs will decrease with the adoption of AV usage given the decreased risk of collision in comparison to increased AV repair costs. It is likely that there will be a transition period where the higher costs of repairing AVs will not be sufficiently offset by the decreased number of accidents since a high volume of non-AV vehicles on the road will continue to be responsible for a significant number of accidents.

### B. Changing Factors For Determining Applicable Insurance Premiums

Currently relevant factors like age, gender, and driving ability may become increasingly obsolete as AV technology replaces human drivers. However, by operation of Proposition 103, the factors of "safety record, mileage and driving experience [] have the greatest influence on auto premiums." (See http://www.insurance.ca.gov/0400-news/0200-studies-reports/0600-research-studies/auto-policy-studies/executive-summary.cfm [last accessed on January 31, 2020].) As a result, increased adoption of AVs may create legislative pressure to modify the current premium rating system implemented by Proposition 103 and similar regulatory regimes in other states.

### C. New Insurance Coverage Opportunities

Although premiums are expected to decline in the long term, in the short term, insurance coverage for AVs is expected to bring $81 billion in new premiums to the insurance industry over the next eight years, mostly in the form of three new lines of coverage:

(a) **Cybersecurity Insurance:** protection against remote vehicle theft, unauthorized entry, ransomware and hijacking of vehicle controls, as well as coverage for identity theft and privacy breaches.

(b) **Product Liability For Sensors And Software Algorithms:** Manufacturer-based coverage for failures related to communications (e.g., internet connection), software (including software bugs, memory overflow and program defects) and hardware (sensory circuit failure, camera vision loss, and radar and lidar failures).

(c) **Public Infrastructure:** Insurance for public and/or corporate entities operating cloud server systems that manage traffic and road networks, in addition to failure of external sensors and signals; and communication problems originating at the system level.

### D. Competition from AV Manufacturers Entering Insurance Industry

In order to cut costs for consumers and remove the "adoption barrier" for this new technology, AV manufacturers are beginning to bundle auto insurance with the vehicles themselves. For example, Tesla has already partnered with Liberty Mutual to create an insurance plan called InsureMyTesla that is cheaper than traditional plans because it factors in the vehicles' Autopilot safety features and maintenance costs.

In this context, manufacturers already have an advantage over traditional auto insurance companies because the manufacturers have real-life statistics sent remotely by the computers within the cars themselves, with data centers full of data not only about accidents but also about near misses. This means that manufacturers can generate accurate statistics about accidents of their own cars as often as they want and thus more accurately estimate the cost to insure their cars.

Moreover, with respect to first-party damage claims and substitute rental vehicle coverages, manufacturers may be able to leverage their existing manufacturing, distribution and repair networks (i.e. dealerships) to manages the costs associated with resolving AV first-party claims.

### E. Potential "Pitfalls" In Existing Auto Policy Language

ISO forms and other standardized auto policy language will need to be updated to reflect rapidly changing technology. Currently, the vast majority of auto policies assume there is a human driver reflecting the realities of the last century.

Additionally, given the complex, ongoing interaction between AVs and the software systems provided by the AV manufacturer, permissive user language of current auto policies may put insurers at risk of unintentionally including the AV manufacturer as an insured under their policies.

Recognizing this issue, the SAE published a Recommended Practice guide for terminology to be used for describing autonomous vehicles.[3] Below are some notable excerpts from that guide that illustrate some potential pitfalls into which insurers could fall into by using imprecise policy language:

[3] Society of Automotive Engineers (SAE) International, Surface Vehicle Recommended Practice: Taxonomy and Definitions for Terms Related to Driving Automation Systems for On-Road Motor Vehicles J3016 (June, 2018).

**1.** **"Control" –** In colloquial discourse, the term "control" is sometimes used to describe the respective roles of a (human) driver or a driving automation system (e.g., "the driver has control"). The authors of this Recommended Practice strongly discourage, and have therefore deliberately avoided, this potentially problematic colloquial usage. Because the term "control" has numerous technical, legal, and popular meanings, using it without careful qualification can confuse rather than clarify. In law, for example, "control," "actual physical control," and "ability to control" can have distinct meanings that bear little relation to engineering control loops. Similarly, the statement that the (human) driver "does not have control" may unintentionally and erroneously suggest the loss of all human authority.[4]

**2.** **"Autonomous" –** This term has been used for a long time in the robotics and artificial intelligence research communities to signify systems that have the ability and authority to make decisions independently and self-sufficiently. Over time, this usage was casually broadened to not only encompass decision making, but to represent the entire system functionality, thereby becoming synonymous with automated. This usage obscures the question of whether a so-called "autonomous vehicle" depends on communication and/or cooperation with outside entities for important functionality (such as data acquisition and collection). Some

[4] *Id.* at 29.

driving automation systems may indeed be autonomous if they perform all of their functions independently and self-sufficiently, but if they depend on communication and/or cooperation with outside entities, they should be considered cooperative rather than autonomous. Some vernacular usages associate autonomous specifically with full driving automation (level 5), while other usages apply it to all levels of driving automation, and some state legislation has defined it to correspond approximately to any ADS [automated driving system] at or above level 3 (or to any vehicle equipped with such an ADS). Additionally, in jurisprudence, autonomy refers to the capacity for self-governance. In this sense, also, "autonomous" is a misnomer as applied to automated driving technology, because even the most advanced ADSs are not "self-governing." Rather, ADSs operate based on algorithms and otherwise obey the commands of users.[5]

## IV. Regulatory Landscape Regarding Legal Liability And Coverage In Connection With AVs

### A. Current Regulatory Landscape – Federal

At present, there are few federal regulations with respect to AVs:

[5] *Id* at 28.

1. **Self Drive Act:** Swiftly passed by House of Representatives in 2017, preempting state laws regarding vehicle design, construction, and performance.

2. **AV Start Act:** Currently stalled in Senate. If passed, it would preempt state and local safety regulations and allow AV manufacturers to begin testing on open roadways rather than computer simulations or closed tracks.

## B. Current Regulatory Landscape – California

### 1. Key Definitions

Cal.Veh. Code § 38750(a)

"Autonomous technology" means technology that has the capability to drive vehicle *without the active physical control or monitoring by a human operator*.

"Autonomous vehicle" means any vehicle equipped with autonomous technology that has been integrated into that vehicle.

An "operator" of an autonomous vehicle is the person who is seated in the driver's seat, or, if there is no person in the driver's seat, *causes the autonomous technology to engage*.

A "manufacturer" of autonomous technology is the person…that originally manufactures a vehicle and equips autonomous technology on the originally completed vehicle or, in the case of a vehicle not originally equipped with autonomous technology by the vehicle manufacturer, the person that modifies the vehicle by installing autonomous technology to convert it to an autonomous vehicle after the vehicle was originally manufactured.

DMV Regulatory Text – Title 13, Division 1, Chapter 1, Article 3.7

"Autonomous mode" is the status of vehicle operation where technology that is a combination of hardware and software, remote and/or on-board, performs the dynamic driving task, with or without a natural person actively supervising the autonomous technology's performance of the dynamic driving task. An autonomous vehicle is operating or driving in autonomous mode when it is operated or driven with the autonomous technology engaged.

"Autonomous test vehicle" is a vehicle that has been equipped with technology that is a combination of both hardware and software that, when engaged, performs the dynamic driving task, but requires a human test driver or a remote operator to continuously supervise the vehicle's performance of the dynamic driving task… For the purposes of this article, an "autonomous test vehicle" is equipped with technology that makes it capable of operation that meets the definition of Levels 3, 4, or 5 of the SAE International's Taxonomy and Definitions for Terms Related to Driving Automation Systems for On-Road Motor Vehicles, standard J3016 (SEP2016), which is hereby incorporated by reference.

"Dynamic driving task" means all of the real-time functions required to operate a vehicle in on-road traffic, excluding selection of final and intermediate destinations, and including without limitation: object and event detection, recognition, and classification; object and event response; maneuver planning; steering, turning, lane keeping, and lane changing, including providing the appropriate signal for the lane change or turn maneuver; and acceleration and deceleration.

**2. Requirement that Manufacturer Maintain $5 Million Insurance**

Cal. Veh. Code § 38750(c)(3) states:

> Prior to the start of testing in this state, the *manufacturer performing the testing shall obtain an instrument of insurance, surety bond, or proof of self-insurance in the amount of five million dollars ($5,000,000),* and shall provide evidence of the insurance, surety bond, or self-insurance to the department in the form and manner required by the department pursuant to the regulations adopted pursuant to subdivision (d).

Criticism of this $5 million testing requirement statute is abundant (A similar $5 million testing requirement statute was recently repealed in Florida.) First, the statute fails to scale for the size of the fleet being tested, meaning a large manufacturer testing a fleet of hundreds of cars has the same $5 million net worth requirement as a small startup testing a single car, despite the obvious differences in potential damages resulting from failed tests. Second, it fails to account for the class of vehicle, even though a fleet of semi-trucks would likely cause more damage than a fleet of compact cars. Third, it may stifle competition, creating an artificial barrier to entry to newcomers, favoring established car manufacturers.

"Without proper definition and insurance policy language, unscrupulous insurance brokers can simply sell a standard general liability policy of $5,000,000 without telling the carrier. The carrier is then legally liable for risks not defined in the policy form and can deny coverage to cover autonomous test vehicles in a similar manner that transport network company vehicles have been denied upon accident and discovery." – DMV Article 3.7 Final Statement of Reasons

**C. Current Regulatory Landscape – Other States**

Current state laws are a "patchwork" of inconsistent requirements and other provisions. (See https://www.ncsl.org/research/transportation/autonomous-vehicles-self-driving-vehicles-enacted-legislation.aspx; https://www.ghsa.org/state-laws/issues/autonomous%20vehicles).

For example, several states currently allow AV manufacturers to test vehicle on open roadways rather than in computer simulations or closed tracks. (AZ, CA, CO, D.C., FL, GA, GA, MI, NB, NV, NC, TN, TX, WA).

States also vary widely on the level of permitted automation, with some states permitting entirely driverless vehicles (AZ, CA, D.C., FL, GA, MI, NB, NV, NC, OH, TN, TX, WA), some allowing autonomous vehicle operation but requiring a human in the driver's seat to monitor (CO, Conn., ME, MA, UT, VA) and even one state requiring both a monitoring human in the driver seat and a following police escort (NY).

**D. Proposed Liability Schemes**

**(a) <u>Owner liability</u>**

**(i)** Many argue that the most of the goals of current owner-liability theories will not be served if extended to autonomous vehicles. Currently, there are four ways liability can be shifted to a vehicle owner even if they are not driving:

**A)** <u>Modification of the vehicle by the owner:</u> If the owner attempts to override the AI system piloting the vehicle, or modifies the vehicle in any way, then the normal principals of negligence will still apply because the owner did not act as a reasonably prudent person would.

**B)** <u>Negligent entrustment</u>: Negligent entrustment holds the vehicle owner negligent for entrusting his vehicle to a person who the owner had reason to believe was unfit to drive. For example, if an owner entrusts his vehicle to a drunk driver who causes an accident, then the owner has breached his duty of due care to others on the road by allowing an unfit driver to use his vehicle. Therefore, the owner is said to be “negligent” and can be found liable for the driver's acts. However, autonomous vehicles are meant to eliminate human-choice factors, such as speeding, drunken driving, fatigue, and distracted driving, and in doing so are projected to save thousands of lives annually. Thus, classifying an autonomous vehicle as "unfit" contradicts the purpose of the vehicle.

**C)** State permissive use statutes: Liability of owners for permissive users may be passed on to manufacturer. California's permissive user statute (Veh. Code, § 17150) imposes liability on owners for injuries caused by those who operate their cars with the owner's permission (capped at $15/30/5 by Veh. Code § 17151(a)). In the context of autonomous vehicles, an owner who engages the autonomous technology "gives permission" to the technology to operate the vehicle, and will therefore be liable. However, in the context of autonomous vehicles, the technology was created by, and will likely be owned by, the manufacturer - meaning the owner (or the owner's insurer) may, in turn, have a right of subrogation against the manufacturer.

**1)** With respect to rental car companies, Congress passed the Graves Amendment (49 U.S.C § 30106) which effectively eliminated permissive user liability for rental car companies. If there is a significant risk of permissive user liability for AV manufacturers, it is likely that AV manufacturers may seek similar legal protections.

**D)** Respondeat Superior: Respondeat superior mandates that an employee's actions must be within the scope of employment for liability to be imposed on an employer. However, it is highly questionable whether a vehicle would qualify as an “employee” or “agent” of the owner. Assuming it is treated as an “employee” for liability purposes, an autonomous vehicle's "job" is to drive, so every time it is active, its actions are "within the scope of its employment." Like state permissive use statutes, the owner will be liable every time the vehicle is in use.

**(b) Manufacturer liability**

**(i)** Manufacturer liability is generally grounded in products liability law, in which a plaintiff must show that a product is defective for one of three reasons: (1) a manufacturing defect, (2) a design defect, or (3) it is defective because of inadequate warnings or instructions. In the context of autonomous vehicles, products liability suits based on inadequate warnings may be common during the Level 2-4 stages of autonomy due to the fact that the driver is expected to take over controls after the vehicle warns or instructs the driver to do so.

**(ii)** Unlike auto liability cases where the limits of available coverage are often limited by statutory minimums (i.e. 15/30 personal auto liability policies), products liability cases would generally fall under the AV manufacturer's CGL primary and excess policies, thereby making greater indemnity limits available for such cases. At the same time, standardized CGL policies typically contain "auto" exclusions which attempt to exclude auto related risks from CGL coverage. (*See Essex Ins. Co. v. City of Bakersfield* (2007) 154 Cal.App.4th 696, 709 [discussing insuring intent of auto exclusions in CGL policies].) These exclusions are typically written in terms of losses "arising out of the ownership, maintenance, use or entrustment to others…." (ISO Form CG 00 01 12 07, Sec. 1, Coverage A, ¶ 2.g.) As a result, it is reasonable to expect subsequent litigation on the question whether an AV manufacturer is "using", "maintaining" or "entrusting" a vehicle to an AV owner/passenger in cases where an AV manufacturer is sued under a products liability theory.

**(iii)** Proposed manufacturer liability schemes: inspiration from some unlikely sources:

**A)** Extension of preexisting rules for airplanes and ships involving autopilot. Manufacturers will be liable unless there has been negligence by the user of the autopilot (e.g. a pilot using autopilot during takeoff and landing). Criticism: end-game of fully-autonomous vehicles is total elimination of human control (no steering wheel, brakes, etc.).

**B)** Heightened "common carrier" liability based on liability schemes created for elevators. Proponents argue it's the same process: press a button and arrive at your destination. Critics argue that elevators don't run into each other causing catastrophic accidents (more ways for it to go wrong).

**C)** Annual premium paid to government or designated private insurer by autonomous vehicle manufacturers like Price-Anderson Act for owners of nuclear power plants. Funds would be pooled and used to compensate victims. Criticism: manufacturers could just pass this cost on to consumers, government overreach/federalism.

**D)** Strict liability up to a certain damage amount, like the Montreal Convention which makes air carriers strictly liable up to $100,000 for proven damages and elimination of additional liability by proving the accident was not caused by negligence or was caused by a third party.

**(c)** **<u>Software Liability</u>**

**(i)** Extension of "reasonable man" standard to software. Negligence analysis. Jurors decide whether the software acted reasonably based on their own experiences with vehicles, both automated and traditional. Manufacturers support this approach because it leads to more predictable outcomes.

**(ii)** Some have even proposed that as their built-in AI advances, autonomous vehicles should be given legal personhood, having the same rights and duties as a human being. The law is already very familiar with this concept in the form of corporations, which allows a corporation to be separate and distinct from its shareholders. As applied to autonomous vehicles, this legal status would enable the autonomous vehicle to sue and be sued in the case of an accident. Most importantly, it would place liability on the vehicle as opposed to shifting driver liability to the owner, manufacturer, or programmer. Using the corporate personhood model, the vehicle owner would take the role of the "shareholder" owning 100% of the "shares" in the vehicle, thereby gaining the protection of limited liability in the case of an accident. However, if the owner, manufacturer, and programmer are shielded from liability, who pays? A proposed solution here is to create some kind of reserve fund through a surcharge or tax, or as part of the vehicle's purchase price.

**(d)** **No-Fault Vaccine Compensation Models**

**(i)** Following a 1980s scare over the DPT vaccine, several plaintiffs won large jury awards against vaccine makers, prompting vaccine makers to cease production. Because the scientific consensus is that vaccines are necessary for a safer society and have a low risk of injury, the 1986 National Vaccine Injury Compensation Act (NCVIA) was passed by Congress to create a no fault system (popularly known as "vaccine court") for litigating vaccine injury claims under a court-appointed special master and without a jury. Similarly, the scientific consensus is that autonomous vehicles will be necessary for a safer society and will have lower risks than human-operated vehicles as they continue to develop. The potential for lawsuits being brought against manufacturers of autonomous vehicles could lead to the delay of the widespread implementation of fully autonomous vehicles, allowing the currently intolerable number of annual traffic related deaths to persist.

## V. Audience Questions And Concluding Remarks