

California State Senate

SENATE COMMITTEE ON INSURANCE

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CHAIR



Informational Hearing

AUTONOMOUS VEHICLES AND AUTO INSURANCE IN CALIFORNIA: HOW WILL CONSUMERS BE PROTECTED?

Wednesday March 8, 2017
1:30, Room 112

Summary

In 2015, there were 6.3 million automobile crashes on U.S. roads, injuring 2.4 million people, and killing 35,092, a seven percent increase over 2014. Despite design innovations making cars safer than ever, it was the largest jump in 50 years. Driver deaths rose another 6 percent in 2016, topping 40,000 for the first time since 2007. Driver behavior is the primary culprit for the rising fatalities and crashes overall, including texting while driving and drunken driving.

Highly autonomous vehicles (HAV), vehicles with no steering wheel, brakes or driver, are predicted to eventually reduce the number and overall cost of crashes, and the cost of automobile insurance premiums. Some believe that that the very need for specialized automobile insurance may disappear entirely, with injuries that result from automobile crashes covered by health insurance or homeowners' liability insurance, in the way that bicycle crashes or other crashes are now covered.¹ Others propose schemes such as no-fault insurance or various forms of manufacturer based liability. Still others believe holding vehicle makers accountable for crashes will be the only way to guarantee

¹ Autonomous Vehicle Technology: A Guide for Policymakers, The Rand Corporation 2016

that humans and governments do not end up footing the bill for collisions over which they have no control. They argue a strict liability system would ensure manufacturers have an incentive to make their vehicles as safe as possible while giving victims meaningful access to justice.

California's unique automobile insurance statutes² currently provide a very detailed and mandatory structure for setting auto insurance rates based primarily on the driver's safety record, years of driving experience and miles driven annually. Although other factors approved by the Insurance Commissioner are allowed to be considered in setting rates, they cannot carry more weight than the primary factors. It is not clear how, or if this structure can be used to set insurance rates for fully automated vehicles where the "driver" is a computer program.

Although the design and safety features of HAVs are likely to be determined at the federal level, federal guidance has explicitly stated that insurance will remain the province of states. It will be up to each state to ensure that the process of determining who bears responsibility for damages as a result of a crash remains relatively seamless. Definitive answers about what form insurance will take for HAVs are unlikely at this point, but several questions need to be asked and ultimately answered before the actual deployment of fully autonomous vehicles to the public. These questions include the following:

- If there is no human driver, who is at fault/liable in the event of a crash or other traffic incident involving the vehicle? If the other car has a driver? If neither has a driver?
- Will new insurance products be required for vehicles not anticipated at the time current statutes were enacted? How will insurance rates be determined?
- How will insurance rates be affected during the transition phase—with some fully autonomous vehicles operating simultaneously with large numbers of driver controlled vehicles? Will the higher cost of repairs offset a decline in crashes and increased in safety? How much will crashes have to decline to actually result in a significant reduction in premiums?

² Enacted by initiative as Proposition 103 (1988), The Insurance Rate Reduction and Reform Act

- How will widespread adoption of fully autonomous vehicles affect the insurance industry if premiums decline significantly?
- Who will control the vast data collected by HAVs and how will it be used?
- Who bears responsibility if a vehicle's control system is hacked?

Background

The Federal Automated Vehicle Policy (FAVP)³, in demonstrating the need for automated vehicle technology cited the fact that 94% of crashes can be tied to human choice or error. The expectation is that automated driving innovations could dramatically decrease the number of crashes tied to human choices and behavior. Autonomous cars remove the human factor, and could, according to some experts, reduce crashes by as much as 90 percent, saving 30,000 lives a year. These advances are also expected to open mobility and options to people with disabilities, a growing number of seniors, people who live in communities where car ownership is prohibitively expensive (including the cost of car insurance), and those that prefer not to own or drive a car. At least one company has committed to producing commercially viable driverless car technology for deployment on public roads as soon as 2020 with others close behind.

It takes approximately 15 years for the fleet of cars on the road to turn over completely to the next generation, which means the roads are always filled with a mix of technologies. The initial rollout of HAV deployment is likely to involve ride-sharing services, not individual sales. Ride sharing services anticipate that the fleet deployment of HAVs will dramatically reduce the need to own a car and thus reduce vehicle miles overall. Alternatively, it could make travel so easy that people will travel more than ever, causing vehicle miles to soar. The insurance implications of this kind of commercial deployment will pose fewer questions than individual purchase of HAVs. Commercial insurance is less highly regulated and driven more by market factors than individual insurance markets. It is likely that automobile manufacturers and developers will negotiate some kind of accommodation for liability sharing with insurers, or will self-insure, in these cases. This would be more akin to the umbrella coverage provided by rideshare services now, without the added complication of the vehicle owner's personal insurance policy covering usage during non-commercial operations.

Under current law for privately owned vehicles, the driver is generally considered exclusively responsible for control of the vehicle. Hence, we commonly speak of crashes as being caused by

³ Federal Automated Vehicle Policy, U.S. Dept. of Transportation, September 2016
<https://www.transportation.gov/AV/federal-automated-vehicles-policy-september-2016>

one or more at-fault drivers. In the vast majority of crashes, we assign blame to one or more drivers rather than to design features of the car. If a product defect of the vehicle is involved, that is usually determined after insurance claims are paid, with the insurer and/or car owner seeking subrogation from the manufacturer. Such product liability claims will likely become more frequent and complicated as cars are equipped with more autonomous features, but with the driver still ultimately responsible for taking over from the computer in certain situations. This situation is exemplified by vehicles manufactured by Tesla.

What is “autonomous”?

The Society for Automotive Engineers International (SAE) has developed the framework used in the United States and internationally for defining the various levels of automation currently found in, and being developed by manufacturers. The SAE definitions, adopted as part of the FAVP, divide vehicles into levels based on “who does what, when.”⁴ The structure does not include active safety systems such as lane keeping assistance, electronic stability control and automated emergency braking because they operate only on a momentary basis and do not change or eliminate the role of the driver.

- At SAE Level 0, the human driver does everything;
- At SAE Level 1, an automated system on the vehicle can sometimes assist the human driver conduct *some parts* of the driving task [such as cruise control];
- At SAE Level 2, an automated system on the vehicle can *actually conduct* some parts of the driving task, while the human continues to monitor the driving environment and performs the rest of the driving task [automated braking systems];
- At SAE Level 3, an automated system can both actually conduct some parts of the driving task and monitor the driving environment *in some instances*, but the human driver must be ready to take back control when the automated system requests [Tesla];
- At SAE Level 4, an automated system can conduct the driving task and monitor the driving environment, and the human need not take back control, but the automated system can only operate in certain environments and under certain conditions; and
- At SAE Level 5, the automated system can perform all driving tasks under all conditions that a human driver could perform them.

⁴ SAE, Taxonomy and Definitions for Terms Related to On-Road Motor Vehicle Automated Driving Systems J3016_201401; Federal Automated Vehicles Policy, 2016 National Highway Traffic Safety Administration

The transition from partially self-driving to fully autonomous will take many years and will complicate the insurance landscape and insurance products required by the marketplace. Insurance for vehicles meeting SAE levels 1-3 can be set within the existing automobile insurance structure with little disruption. That said, there will likely be a great deal of litigation involving vehicles with some degree of autonomous technology parsing out liability, and raising the basic question: who was in control of the car at the time of the crash—the technology or the driver? In these cases, traditional insurance will still apply at the outset, with insurers potentially seeking subrogation from manufacturers to the extent the car is determined to be at fault, or if a defect in the vehicle is determined to be responsible.

This hearing is focused on insurance issues involving fully autonomous SAE level 4 and 5 vehicles with no driver control, including how they will be insured for liability, and how they will interact with, and determine liability for crashes with non-autonomous vehicles on the road.

Federal Role

The National Highway and Transportation Safety Administration (NHTSA) proposes to regulate HAV performance and safety standards at the national level. The federal government, it said, should set standards for equipment, including the computers that could potentially take over the driving function. It will also continue to investigate safety defects and enforce recalls.

States' responsibilities include other aspects of motor vehicle regulations:

- Licensing (human) drivers (for SAE levels 3 and below) and registering motor vehicles in their jurisdictions;
- Enacting and enforcing traffic laws and regulations;
- Conducting safety inspections, where States choose to do so; and
- Regulating motor vehicle insurance and liability.

States will need to determine who (owner, operator, passenger, manufacturer, etc. or combination thereof), must carry insurance for HAVs. SB 1298 (Padilla, Ch. 570, Stat. of 2012) defines an “operator” of an autonomous vehicle as 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. That bill also required a manufacturer testing autonomous vehicles on California roads to maintain a surety bond, or proof of self-insurance, in an amount of \$5 million. Determination of whom or what is the “driver” or “operator” of an HAV in a given circumstance does not necessarily translate into liability for crashes involving that HAV.

- Will manufacturers bear sole responsibility for crashes?

- Will traditional auto insurance apply with insurers seeking some level of subrogation from manufacturers?
- Will vehicles carry some minimal value auto insurance policy for minor incidents with manufacturers carrying umbrella coverage for incidents exceeding that amount? How much liability coverage should they be required to maintain once they move from testing to actual deployment?

The First Phase of HAV Deployment: Common Carrier and Ridesharing

The initial months or years of actual HAV deployment is likely to involve fleet or manufacturer deployment rather than sale to private individuals. In fact, Ford and BMW have stated their goal of deployment by 2021 is for ride-sharing purposes. In this initial phase of deployment, manufacturers may assume some form of strict product liability. For example, in testimony to Congress last month, the Vice President for Government Affairs of Volvo stated that “when cars are in autonomous mode, [Volvo] believes the product liability should no longer rest with the driver, but should be assumed by the manufacturer.”⁵ Under strict liability, manufacturers would accept responsibility for all crashes caused by their cars, no matter whether the damage was minor or major. Strict liability removes the issue of manufacturer negligence and replaces it with the consumer expectation that a product not be unreasonably dangerous. Volvo qualified its statement, however, by stating that it assumes liability when the incident is the result of a “defect in the AD technology.” Left unanswered, however, is how and when the finding of a defect triggers liability coverage. Will Volvo bear liability at the outset, and then seek subrogation from the other party? What if the accident is a combination of HAV defect and other causes, such as a failure to properly maintain the vehicle?

Whether purchasing a vehicle or service in a ride share vehicle, manufacturers may believe that taking liability for crashes will make consumers more likely to accept the risk of giving up driving control. This is particularly true if the costs are offset by decreases in, or the complete elimination of, drivers’ insurance premiums. At the same time, in our fault based system, fault will still need to be determined in a crash between an AV and another vehicle to determine ultimate liability and make the not-at-fault party whole. Further complicating the insurance issue, Volvo has indicated it is testing a vehicle with a steering wheel that tucks away while in autonomous mode, but also allows its owner to drive manually for pleasure.

Individually Owned Autonomous Vehicles and Proposition 103: Does it Work?

The Insurance Rate Reduction and Reform Act, also known as Proposition 103 (Prop 103), requires prior approval of certain insurance rates, most prominently auto and homeowners’ insurance, and prohibits an insurance rate from being approved or remaining in effect which is

⁵ Statement of Volvo Car Corporation before the House Committee on Energy and Commerce, February 14, 2017

excessive, inadequate, unfairly discriminatory, or otherwise in violation of the applicable provisions of law. The 1988 measure specified the factors an automobile insurer may use to rate auto insurance premiums, with the top three being the driver's safety record, annual miles driven and years of driving experience. It also allows such other factors as the Insurance Commissioner (IC) may approve, but they cannot outweigh the first three. Prop 103 also made the California Insurance Commissioner an elected official, and subjected insurers to California's antitrust laws, civil rights laws and unfair business competition law.

Prop 103 was written so that it can only be changed by legislation that "further the purpose" of Prop 103, and even then it must pass with a 2/3 legislative majority. Any other change must be submitted to the voters. As a result, there have been very few changes to California's insurance rate regulation law. Several legislative attempts to make changes have been successfully challenged in court as not furthering the purpose of the law.

So called "self-driving" cars that still require a person in a driver's seat and have a steering wheel, accelerator and brakes are really just an evolutionary change in vehicles that progressively have become more automated over the last decade. As such, the changes in auto insurance to cover such vehicles can arguably still fit within the Prop 103 model based on the driving record of the driver. For example, the IC has approved several additional optional rating factors, including safety and protective devices, and vehicle performance capabilities. All major automakers already sell models with traction control, self-parking, collision avoidance and adaptive cruise control features. Since drivers are still able to control these cars, they will still need traditional liability insurance. Some claims involving these cars may include product liability claims—some types of accident claims already are—but most accidents would still most likely result from human error. The insurance business will continue in much the same way for most insurers and most consumers under these circumstances for many years. Despite the increases in accidents cited earlier, these safety features are expected to reduce claim frequency, although with more sophisticated technology they may actually increase the cost of repairs. There's one possible exception: cars with even some self-driving capacity may be more difficult to steal. Many of these cars are likely to be traceable via its GPS system and have a "kill switch." Protection against theft isn't a huge part of auto insurance premiums in most places but, in the long term, greater deployment of self-driving cars may ultimately lead to a major reduction to an entire category of crime.

- Will consumer protections such as Prop 103 that control insurance rates be necessary for HAVs? Should the current system based on "personal responsibility" still apply?
- Will new insurance products outside the Prop 103 construct be necessary? Should insurance liability responsibility be shared by the "owner" and manufacturer? How?
- How will rates be set initially in the absence of significant claims experience?

- How will HAVs provide evidence of financial responsibility (proof of insurance) in the event of an accident?

Changes Ahead for the Insurance Industry

Traditionally insurance companies have relied on past behavior to predict the future. Rates have been required to be actuarially sound based on past loss experience. What happens when there is little experience on which to base pricing decisions?

The kinds of fully autonomous cars and trucks that Google, Volvo, Ford, Uber and many others are now testing could represent a dramatic change in the insurance market. If a driver can't manipulate a car in any way (except maybe to press a "stop" button) most crashes will probably result in product liability claims if an accident is the result of the actions of the autonomous vehicle itself. Automakers as well as some insurance and consumer groups could argue for offering insurance coverage for such vehicles on a no-fault basis. This, in turn, could lead to resurgence in arguments for no-fault coverage.

In writing driverless insurance policies, underwriters will likely focus on the make and model of a car instead of a driver's accident history or how often he drives. There may also be the introduction of "black boxes," data recorders akin to those found in airplanes that can track car data and decipher what really happened seconds before a crash.

According to some estimates, as much as 80 percent of auto insurance premium volume will disappear with the widespread deployment of HAVs, resulting in the near elimination of the auto insurance industry as we know it. On the other hand, HAVs could create new opportunities for insurers in cybersecurity and alliances with car makers. At the same time, in 2015, KPMG surveyed senior U.S. insurance executive whose companies, in aggregate, account for almost \$85 billion in personal and commercial auto premium and found that few insurers have taken action—not due to doubts about the possible ramifications, but rather because they believe the potential impact is too distant in the future to begin preparing. Key findings of that survey included:

- Only 29 percent felt very knowledgeable about autonomous vehicles, and a small percentage (10 percent) have developed a strategic plan to deal with the impact.
- Insurers said that underwriting, product management, and claims will all require significant adjustment as autonomous vehicles enter the market.
- Insurers believed that there will be opportunities to develop different products to cover autonomous vehicles, which will also open the door for new competitors to enter the industry. At the same time, many anticipate increased consolidation among the traditional writers.

According to a recent report issued by Aon Benfield⁶, expectations are that “industry pure premiums” for auto insurance will drop 20 percent under their 2015 levels by 2035, even if the technology is adopted at just a moderate pace. Assuming the same moderate trajectory, those premiums could plunge by more than 40 percent if full adoption of autonomous vehicles takes place, as expected, by 2050. That prediction assumes a number of variables, including an envisioned 81 percent drop in claims frequency over time. They also assume higher claims severity behind those numbers, because of sensor costs and greater cost of handling product liability claims. KPMG has estimated the current average accident expense could increase from almost \$14,000 to roughly \$35,000 by 2040.

Many questions remain about the actual safety performance—and related premium reductions for consumers, including:

- Will increased repair costs offset premium reductions or actually lead to higher premiums in the short term?
- As long as there is a mix of autonomous and driver-controlled vehicles on the road, will the reduction in incidents be sufficient to lead to an overall reduction in rates? With fault more likely to be placed on the driver-controlled vehicle, will their rates go up?
- How will human behavior change in relation to HAVs? Will pedestrians engage in more dangerous behavior because of assumptions about HAV performance?

Who Controls the Data?

HAVs will collect vast amounts of information related to the operation of the vehicle, its location, its speed, driving conditions, and route. Manufacturers and other entities will be required to have a documented process for testing, validation, and collection of event, incident, and crash data, for the purposes of recording the occurrence of malfunctions, degradations, or failures in a way that can be used to establish the cause of any such issues. New safety metrics from manufacturers and other entities will be required to collect, store and analyze data regarding positive outcomes in addition to event, incident, and crash data.

Who controls that data will be pivotal in determining liability issues surrounding these vehicles. It also raises significant privacy issues for owners and passengers of those vehicles. At the same time, manufacturers and developers have a strong interest in protecting what they consider proprietary information. Consumer privacy, who controls the information, and how it can be used will be the subject of much discussion going forward, but is not within the jurisdiction of this committee.

⁶ Aon Benfield annual Global Insurance Market Opportunities Report, September, 2016

Insurers, who rely on past data to assess the risk—and set rates— will need access to performance information if they are to retain their traditional role as underwriters for this risk. In addition, they will need access to data from the vehicle in the event of a crash to determine the cause of the accident, and assess liability to ensure claimants are compensated fairly and efficiently. SB 1298, which set the rules for testing of HAVs in California, required the autonomous vehicle to have a separate mechanism, in addition to and separate from any other mechanism required by law, to capture and store the autonomous technology sensor data for at least thirty seconds before a collision occurs between the autonomous vehicle and another vehicle, object, or natural person while the vehicle is operating in autonomous mode. The autonomous technology sensor data must be captured and stored in a read-only format by the mechanism so that the data is retained until extracted from the mechanism by an external device capable of downloading and storing the data. Such data is required to be preserved for three years after the date of the collision. Quick access to such information will be essential for emergency responders and investigators, insurers, and manufacturers to understand and improve their products. Any determination regarding whether it was driver error or a failure of the automated driving system can only happen if their insurer has access to key data about the crash.

- How will insurers access this data? And how much data will manufacturers be willing to share to underwrite risks associated with HAVs? Should performance data be considered proprietary?