2019 CLM Midwest Conference
June 20-21, 2019
Chicago, IL

"I, Autonomous Vehicle": When and How This Statement Could Disrupt the Insurance Industry

I. Economics of Autonomous Vehicle Technology Adoption (app. 12 minutes)

A. Autonomous Vehicles: Past and Present

1. The Stanford Racing Team's Victory in 2005

Like the advent of other important catalyzing technologies such as the internet and interstate highway system, autonomous vehicle (AV) technology was borne out of academic research with emphasis on national security. When the Stanford Racing Team's modified Volkswagen Touareg, "Stanley" won a 132-mile off-road robotic vehicle race in Nevada by a massive margin, it was hailed as a watershed moment in the research and development of AV technology. While "Stanley" did not navigate city streets, crowded with vehicle and pedestrian traffic, Stanford Artificial Intelligence (AI) Laboratory Professor Sebastian Thurn put it simply: "The impossible has been achieved."[1]

2. State of Private Investment if Robust and Growing

Stanley's achievement set in motion rapid increases in spending and the breadth of entities involved in research and development (R&D). Currently, there are 46 companies worldwide engaged in commercialization of AV technology. These include pioneers like Tesla; tech giants like Apple, Google and Amazon; virtually all major auto brands including BMW, Audi, Toyota, Ford and VW; and a host of startups supporting technological improvement. AV R&D is attracting large and growing sums of private investment from venture capital (VC) as well as national and state governments. Even with all the private investment, the U.S. government recently allocated $100 million to facilitate AV R&D.

B. Benefits of Autonomous Vehicle Technology Far Exceed Costs

While it's clear that AV are coming, the public had been largely unaware of the how quickly the technological capabilities were being improved. Naturally, the human condition cause many in the public to sensationalize potential adverse impacts on the U.S. economy, even with the host of potential social

[1] https://news.stanford.edu/news/2005/october12/stanleyfinish-100905.html

benefits. Some claimed, without an analytical basis, AV technology would displace 4 million U.S. Jobs.[2] The US needs to add 2.4 million jobs annually (200,000 monthly) to achieve normal GDP growth. In the void of rigorous thought on the topic, Securing America's Energy Future (SAFE) convened world class economists to quantify and compare the consumer and social benefits of AV technology with potential employment impacts.

1. SAFE Projections for Autonomous Vehicle Adoption

Aggregate measures of benefits and employment impacts depend on the rate of AV technology adoption, the specific type of AVs deployed and how they are deployed. SAFE has developed models projecting AV adoption considering these and other factors. SAFE projects the U.S. passenger vehicle fleet could be entirely autonomous by 2050, with nearly two-thirds of the AV adoption occurring between 2028 and 2038.

The largest barrier to AV adoption is cost. However, like with renewable energy, personal computers, personal electronics and other technology, innovation along the development and manufacturing chain along with public facilitation will eventually erode these barriers. A 2017 economic survey that even with all the potential benefits, 40 percent of Americans are unwilling to pay more for AV technology. Additionally, a unique and potentially intangible barrier to AV adoption in the U.S. is our identity with the automobile and car ownership.

2. Consumer and Social Benefits v. Employment Impacts at Full Adoption

Even accounting for the nearly half of Americans unwilling to purchase the currently higher-priced AVs, benefits of AV technology are projected to reach nearly $800 billion annually by 2050. Over $500 billion in benefits are realized as avoided direct and social costs of auto accidents caused only by gross driver error: chemical influence, distraction and speeding. Other major benefits include reduced travel time from congestion mitigation ($71 billion), consumer benefits from reduced dependence on oil and social benefits from reduced environmental impact ($58 billion combined). Cumulative benefits will reach $3.2 to $6.3 trillion by 2050. However, even the annual benefits would far exceed the cumulative employment impacts. Considering retraining, spawning of new industry and actual data from past catalyzing technology, long term unemployment from AV deployment will range from adding 0.06% to 0.13% to baseline unemployment that typically hovers around 5.00% when Americans are what economists call "fully employed."

3. Benefits Time Path and Sensitivities

While the benefits, which are conservative by the SAFE economists' measures, far outweigh employment impacts, it is important to understand annual benefits will be less than $200 billion for the next 15 years. It is unclear whether than how the SAFE economists accounted for the potential net costs of the period of growing pains that will undoubtedly occur in their early deployment, particularly at lower fleet penetration rates, not to mention if AV technology is commercialized two quickly or proper regulation is not in place.

C. Unmet Concerns for the Realization of Short-Term Benefits

[2]

There are host of unmet concerns with AV technology as we are increasingly moving toward commercialization including imperfect technology (camera recognition issues), security (hacking), unforeseen safety issues (consider the case of the US airline industry) and the need for ethical decisions in the case of accident and collision avoidance (safe the driver or the pedestrian) that will result in auto, property and other claims with new legal, claims and coverage issues.

D. Implications for Economic Valuation of Auto Accident Claims

Auto accident insurance claims can involve economic losses relating to injury, disability and fatalities, cost of auto repairs or total loss (auto damage) and temporary expenses and public and private property damage. AV will act to raise the average size of auto damage claims, particularly in the short term. AV are more valuable, will retain more value and be more expensive to repair, when feasible. While the cost of AV technology will decline with time (think personal computers, flat-screen TVs), the incidence of total loss will be much greater than with non-AV until and unless cost-effective ways to repair the electronic and other technical features are developed.

II. Determining Liability as it Applies to Autonomous Vehicles (app. 10 minutes)

A. Civil Liabilities Arising from Car Accident

Civil liabilities arising from car accidents stem from personal injury tort law, specifically, theories of negligence, strict liability and products liability.[3] To bring a negligence lawsuit, a plaintiff must show a failure to act as a reasonable person to someone to whom he owes a duty, as required by law under the circumstances. In strict liability, the defendant is liable for harm that his actions caused even though there may have been no misconduct at all by the defendant, by showing that the person was involved in a dangerous activity. Lastly, a person may also bring a products liability lawsuit alleging a manufacturing defect, design defect or failure to warn.

B. Determining Liability Based on the Operator

To determine where liability falls with the use of an autonomous vehicle, it may be imperative to first determine who is operating the vehicle. The parties at fault can be divided into the operator, the vehicle manufacturer, the automator, and the programmer.[4] The operator can be the person operating the vehicle, but the word has been defined differently by the states that have passed legislation regarding autonomous vehicles. Nevada and Florida define an "operator" as a person who engages the autonomous technology of a vehicle, regardless of whether the person is physically present in the vehicle while it is engaged.[5] California, however, defines an "operator" 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."[6] The vehicle manufacturer, is generally the original manufacturer of the physical vehicle. The automator is the one that changed the vehicle from a regular vehicle to an autonomous one. Lastly, the programmer is the person responsible for creating the software.

[3] Goodrich, Julie, Driving Miss Daisy: An Autonomous Chauffeur System (2013). Houston Law Review, Vol. 51, No. 1, p. 265, 2013. Available at SSRN: https://ssrn.com/abstract=2330549
[4] *Id.* at pgs. 16-17.
[5] Nev. Admin. Code § 482A.020; Fla. Stat. Ann. § 316.85 (West).
[6] Cal. Veh. Code § 38750 (West).

While any of the four groups could be at fault during an accident involving an autonomous vehicle, it is anticipated that the majority of the liability will fall on the automator under a theory of products liability. Unlike the accidents today, it is believed that if the autonomous vehicle crashes, it will likely be due to the failure to program the car to prepare for a certain situation, or due to a problem with the collision avoidance system.

C. Products Liability Doctrines Applied to Autonomous Vehicles

Autonomous vehicle manufacturers are likely to face liability from manufacturing defects, design defects or a failure to warn.[7] This section will cover the different theories, and how they may be applied to autonomous vehicles.

1. Manufacturing Defect

Manufacturing defects can be alleged when a good is not produced according to its specifications or under the malfunction doctrine, when there is an unexplained accident.[8] A plaintiff must show that the product does not conform to the specifications, regardless of whether there was negligence in the manufacturing process. Manufacturing defect claims can be complicated when it comes to autonomous vehicles, because the software used for autonomous vehicles is not tangible, and it can be difficult to show that an algorithm related to software error was the cause of the accident. A plaintiff may be able to show that an autonomous vehicle failed to work as specified by the manufacturer, including situations where the hardware of the operating systems did not function properly. This could include malfunctioning of the cameras, lasers, and radar. This type of liability should be predictable and similarly handled as the rules for physical components of regular motor vehicles.[9]

If the courts apply the malfunction doctrine, the plaintiff only has to show that the product malfunction during proper use, and the product had not been misused or altered. If this doctrine is applied to autonomous vehicles, it will be much easier to prove liability for an accident. However, many courts have refused to apply this doctrine, or have limited its application to new vehicles only.

2. Design Defect

Design defects are alleged when the foreseeable risk of harm could have been reduced or avoided by the use of a reasonable alternative design. The two main tests used for design defects are the consumer expectation test and the risk utility test. The consumer expectation test is defined as a defect that is unreasonably dangerous beyond the contemplation of the consumer.[10] Under the consumer expectations test, a court looks to what a reasonable consumer would expect from a product. This test has been rejected by the Restatement (Third) of Torts and numerous state courts, however some states still apply the test. In regard to autonomous vehicles, the consumer would expect the vehicle to operate in a safe manner, and if it does not operate safely, the consumer expectation test would apply.

---

[7] Gurney, Jeffrey, Sue My Car Not Me: Products Liability and Accidents Involving Autonomous Vehicles (November 15, 2013). 2013 U. Ill. J.L. Tech. & Pol'y 247 . Available at SSRN: https://ssrn.com/abstract=2352108

[8] *RESTATEMENT (SECOND) OF TORTS* § 402A cmt. h (1965).

[9] Geistfeld, A. Mark, A Roadmap for Autonomous Vehicles: State Tort Liability, Automobile Insurance, and Federal Safety Regulation (2017). 105 Calif. L. Rev. 1611

[10] RESTATEMENT (SECOND) OF TORTS § 402A cmt. g (1965).

The majority of jurisdiction apply the risk utility test for design defects. This test states that a product is defective in design when the foreseeable risks of harm posed by the product could have been reduced or avoided by the adoption of a reasonable alternative design by the seller.[11] For a plaintiff to win a claim, they must show that a reasonable alternative design would have prevented the accident. An example of a plaintiff applying this to autonomous vehicles would include showing that an accident could have been prevented if sensors would have noticed oncoming traffic. Since most of these cases would include software with algorithms, plaintiffs would be required to hire specialized expert to testify.

3. Failure to Warn

A failure to warn is based on a manufacturer's duty to provide instruction about to the product so that it can be used safely or it is based on the manufacturer's duty to warn the consumers of the hidden dangers.[12] This includes informing buyers of hidden dangers and instructing buyers on how to use a product safely. With autonomous vehicles, this could apply to situations where the vehicle arrives at a remote location that the maps do not recognize, causing danger that the consumer is not aware of. Lastly, given that the autonomous vehicle technology is new, consumers may need instructional videos on how to use it properly.

III. Regulations on Autonomous Vehicles (app. 15 minutes)

A. Definitions and Key Terms for Autonomous Vehicles

There are generally considered to be five different levels as progress and technology evolves towards fully autonomous vehicles. At Level 0 – There are no autonomous features. At Level 1 – These cars can handle one task at a time, like automatic braking. At Level 2 – These cars would have at least two automated functions (Tesla Autopilot is considered at this level). AT Level 3 – These cars handle "dynamic driving tasks" but might still need intervention. Level 4 – These cars are officially driverless in certain environments. Level 5 – These cars can operate entirely on their own without any driver presence.

Lidar – pronounced LIE-dar – is shorthand for light detection and ranging. It is a type of sensor that is at the heart of many autonomous car designs and is critical to several worldwide high-resolution mapping efforts. The same technology is used to delineate terrain from airplanes and detect speeding violations.

The automotive industry is currently developing sensor-based solutions to increase vehicle safety in speed zones where driver error is most common: at lower speeds, when the driver is stuck in traffic, and at higher speeds, when the driver is cruising on a long stretch of highway.

Advanced Driver Assist Systems (ADAS), use a combination of advanced sensors, such as stereo cameras and long- and short-range RADAR, combined with actuators, control units, and integrating software, to enable cars to monitor and respond to their surroundings.

Connected-vehicle systems use wireless technologies to communicate in real time from vehicle to vehicle (V2V) and from vehicle to infrastructure (V2I), and vice versa. According to the USDOT, as many

---

[11] RESTATEMENT (THIRD) OF TORTS: PRODS. LIAB. § 2(b) (1998).

[12] Gurney, Jeffrey, Sue My Car Not Me: Products Liability and Accidents Involving Autonomous Vehicles (November 15, 2013). 2013 U. Ill. J.L. Tech. & Pol'y 247. Available at SSRN: https://ssrn.com/abstract=2352108

as 80 percent of all crashes – excluding those in which the driver is impaired – could be mitigated using connected-vehicle technology.

Dedicated Short-Range Communication (DSRC), which uses radio waves, is currently the leading wireless medium for V2V communication. Currently, DSRC offers the greatest promise, because it is the only short-range wireless alternative that provides all of the following: fast network acquisition, low latency, high reliability, priority for safety applications, interoperability, security, and privacy. These features are especially important for active safety applications, because safety-critical communication must be reliable, immediate, network and device "agnostic," and secure. Another benefit of DSRC is that it operates using free spectrum, which is already reserved by the U.S. government for transportation applications.

Within the automotive industry, two entities have emerged for testing and developing V2V and V2I communications. The Vehicle Infrastructure Integration Coalition (VII-C) is a collaboration among federal and state departments of transportation and automobile manufacturers. It is focusing on policy issues that must be resolved before the technology can be deployed.

B. Federal Regulations

The National Highway and Transportation Safety Administration (NHTSA) recently released new federal guidelines for Automated Driving Systems (ADS) called "A Vision for Safety 2.0". These guidelines are divided into voluntary guidance and technical assistance to states. They focus on SAE international levels of automation 3-5, clarify that entities do not need to wait to test or deploy their ADS, revise design elements from the safety self-assessment, align federal guidance with the latest developments and terminology, and clarify the role of federal and state governments. The guidance reinforces the voluntary nature of the guidelines and does not come with a compliance requirement or enforcement mechanism. The guidance attempts to provide best practices for legislatures, incorporating common safety-related components and elements regarding ADSs that states should consider incorporating into legislation.

The SELF Drive Act (H.R. 3388) aims to make several changes to federal law impacting autonomous vehicles. The bill includes four main sections: expansion of federal preemption; updates to federal motor vehicle safety standards (FMVSS); exemptions from FMVSS and a federal automated vehicles advisory council.

The American Vision for Safer Transportation Through Advancement of Revolutionary Technologies (AV START) Act is similar to the SELF Drive Act but does contain some significant differences.

C. State Regulations

Numerous states to date have enacted legislation regarding autonomous vehicles and provide guidance for the development and implementation of the technology for them. We will provide a brief overview of the key legislation and summarize what certain states who are leading the charge are doing.

IV. Impact on Insurance (app. 10 minutes)

A. Impact re Auto Policy Claims

As more autonomous vehicles enter the market place, who is the operator of the subject vehicle will be a factor in determining liability and determining whether an automobile or cyber policy will provide coverage. Automobile policies and claims will adapt to the new technology and become more complex.

B. Impact re Cyber and Tech Policy Claims

Cyber and Tech policies and claims will be impacted pursuant to the difference levels of automation from level zero (no automation) to level 5 (full automation). As more autonomous vehicles enter the market place, cyber and tech policies will adapt to provide first party and third party coverage to fit the needs of the market and become more prevalent.

C. Impact for Claims Professionals and Claims Counsel

The roles of claims professionals and claims counsel will be impacted due to the change in volume of certain claim types, the change in premiums and payouts for claims, and policies in relation to daily work. As more autonomous vehicles enter the market place and the standard of care and liability analyses adapt to the new technology, the complexity of claims handling will increase.

V. How the Insurance Industry Can Prepare (app. 5 min)

D. Auto, Cyber and Tech Policy Changes

What to look for in changes with respect to auto, cyber and tech policies such as exclusions, definitional changes, and coverage in connection with various levels automation.

VI. Autonomous Vehicle Accident to Date (app. 8 min)

A. Review of an accidents from a policy, legal and insurance perspective.

We will discuss a recent accident involving an autonomous vehicle, including why it occurred, how it was legally handled, claims issues and what effect it had on the insurance industry.